

TRANSFORMS AND NUMERICAL TECHNIQUES

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER – III

Subject Code	:		Credits	:	03
Hours / Week	:	03 Hours	Total Hours	:	39 Hours
L-T-P-S	:	3-0-0-0			

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Apply Laplace transforms and inverse Laplace transforms to solve linear ordinary differential equations with constant coefficients, demonstrating proficiency in system analysis and modelling.	L3
2	Analyze periodic functions using Fourier series and evaluate the convergence properties and precision of the series expansion.	L2 & L3
3	Solve problems involving Fourier integrals by applying complex exponential form, Fourier transforms of basic functions, and Fourier sine and cosine transforms.	L3
4	Utilize numerical methods such as Euler's Method, Runge-Kutta 4th order, Adams-Bashforth, and Adams-Moulton Methods to solve differential equations and analyze dynamic systems	L2 & L3
5	Apply finite difference methods, including the Crank-Nicolson method and appropriate techniques for hyperbolic PDEs, to solve various types of partial differential equations (PDEs) such as elliptic, parabolic, and hyperbolic equations.	L3

Table: Mapping Levels of COs to POs / PSOs

COs	Program Outcomes (POs)												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
C01	3	2	2	1					1					
C02	3	2	2						1					
C03	3	2	2	1					1					
C04	3	2	2	1					1					
C05	3	2	2	1					1					

THERMODYNAMICS AND HEAT TRANSFER

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER - III

Subject Code :		Credits :	03
Hours / Week :	03 Hours	Total Hours :	39 Hours
L-T-P-S :	3-0-0-0		

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course, the student will be able to:		
1	Use Zeroth law of thermodynamics to analyze temperature scales.	L2
2	Analyze the work and heat interactions and perform first law analysis of various processes.	L2 & L3
3	Apply the second law of thermodynamics and entropy concepts for analyzing heat engines, refrigerators and heat pumps	L2 & L3
4	Apply ideal cycle analysis to heat engine and refrigeration cycles to determine performance parameters.	L2 & L3
5	Apply governing laws of conduction, convection and radiation heat transfer to determine heat transfer rate and temperature.	L2 & L3

Table: Mapping Levels of COs to POs / PSOs															
COs	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
C01	3	2	1									1	3		
C02	3	2													
C03	3	2	1									1	2		
C04	3	3	2	1	2		1					1	3		
C05	3	1											2		

INTRODUCTION TO AEROSPACE ENGINEERING

SEMESTER - III

Subject Code : 22ASE00XX	Credits : 03
Hours / Week : 03 Hours	Total Hours : 39 Hours
L-T-P : 3-0-0	

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Outline historical developments in the aerospace industry and classify aircrafts and spacecraft	L2 & L3
2	Calculate aerodynamic coefficients and classify different flow regimes	L2 & L3
3	Compare the working of different aircraft and rocket propulsion systems.	L2 & L3
4	Asses various aircraft instruments and systems	L2 & L3
5	Outline recent advances in aerospace industry	L2 & L3

Table: Mapping Levels of COs to POs / PSOs															
COs	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3		2	3							2		3	
CO2	3	3	2	3	3							2		3	

C03	3	3		3	3							1		3	
C04	3	3	2	2	3							2		3	
C05	3	3			2							1		3	

FLUID MECHANICS

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER - III

Subject Code :		Credits :	03
Hours / Week :	03 Hours	Total Hours :	39 + 26 Hours
L-T-P :	3-0-2		

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Apply Pascal law to determine the pressure variation.	L2 & L3
2	Apply governing laws to different types of fluid flows and determine variation of pressure and velocity for different boundary conditions.	L2 & L3
3	Use the concepts of dimensional homogeneity, and similitudes and determine various non-dimensional quantities.	L2 & L3
4	Apply Euler's Equation and Bernoulli's equation to determine flow parameters in flow measuring devices-venturi meter, orifice meter and rotometer.	L2 & L3
5	Determine stream function, circulation and vorticity.	L2 & L3
6	Apply the boundary layer theory to determine turbulence parameters	L2 & L3
7	Determine the head loss in pipes and bends	L3 & L4

Table: Mapping Levels of COs to POs / PSOs															
COs	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3											1		
CO2	3	3			1								1		
CO3	3	3			1				3	3			1		
CO4	3	3											1		
CO5	3	3											1		

C06	3	3											1		
C07	3	3			1				3	3			1		

AEROSPACE STRUCTURAL MECHANICS

SEMESTER - IV

Subject Code : 22ASE00XX	Credits : 04
Hours / Week : 03 Hours	Total Hours : 39 + 26 Hours
L-T-P : 3-0-2	

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Determine loads on aircraft structural members and select appropriate material.	L2 & L3
2	Analyze the axial members for stress, strain and deformation	L2 & L3
3	Construct Shear force and bending moment diagrams and calculated bending and shear stresses in beams.	L3 & L4
4	Analyze the torsional members for stress, strain and deformation.	L3 & L4
5	Determine critical load for columns with different end conditions.	L2 & L3
6	Apply the theories of failure in designing the structures	L2 & L3

Table: Mapping Levels of COs to POs / PSOs															
COs	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
C01	3	3		2	1								3		
C02	3	3	2	3	2				2	2			2		
C03	3	3		3	2				2	2		1	2		
C04	3	3	2	2	2				2	2		1	2		
C05	3	3		2	2				2	2		1	2		
C06	3	3		2	2								2		

SPECIAL TOPICS

SEMESTER - III

Subject Code : 22ASE00XX	Credits : 01
Hours / Week : 02 Hour	Total Hours : 26 Hours
L-T-P : 1-0-1	

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Design and develop automated applications to streamline operational processes	L2 & L3
2	Use proficiency in developing a business plan for conducting market research	L2 & L3
3	Use APIs for data exchange and interoperability in the aerospace systems.	L2 & L3
4	Apply concepts of AI and ML in the design and analysis of aerospace systems.	L2 & L3

Table: Mapping Levels of COs to POs / PSOs														
COs	Program Outcomes (POs)												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
C01	3	3		2	3							2		3
C02	3	3	2	3	3							2		3
C03	3	3		3	3							1		3
C04	3	3	2	2	3							2		3

PROBABILITY AND STATISTICS
[As per Choice Based Credit System (CBCS) scheme]
SEMESTER – IV

Subject Code :		Credits :	03
Hours / Week :	03 Hours	Total Hours :	30 Hours
L-T-P-S :	3-0-0-0		

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Apply the principles of probability to solve complex problems in various real-world scenarios.	L2 & L3
2	Solve and compare different probability distributions, including discrete and continuous random variables, in order to make informed decisions and predictions.	L2 & L3
3	Apply statistical estimation techniques, such as maximum likelihood estimation and interval estimation, to draw meaningful inferences about population parameters from sample data.	L3
4	Examine hypothesis testing methods, including large and small sample tests, to assess the significance of observed data and draw valid conclusions.	L4
5	Analyze statistical relationships and perform sample tests to assess the Equality of means in different populations, Correlation coefficients between variables to determine the strength and direction of the relationship. Independence of variables using appropriate statistical tests to assess the absence of any relationship.	L4

Table: Mapping Levels of COs to POs / PSOs														
COs	Program Outcomes (POs)												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
C01	3	2	2		2				1					
C02	3	2	2		2				1					
C03	3	2	2						1					
C04	3	2	2		2				1					
C05	3	2	2		2				1					

AEROSPACE MANUFACTURING

SEMESTER - IV

Subject Code : 22ASE00XX	Credits : 04
Hours / Week : 03 Hours	Total Hours : 39 + 26 Hours
L-T-P : 3-0-2	

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Understanding of Aerospace Materials: Students will learn about the materials commonly used in aerospace manufacturing,	L2 & L3
2	Proficiency in Manufacturing Techniques: Students will develop practical skills in manufacturing techniques relevant to aerospace production.	L2 & L3
3	Problem-Solving and Decision-Making Skills: Through practical exercises and real-world case studies, students will enhance their problem-solving and decision-making abilities in the context of aerospace manufacturing challenges.	L2 & L3
4	Ethical and Professional Conduct: Students will understand the importance of ethical behavior and professional conduct in aerospace manufacturing. They will learn about industry ethics, responsible practices, and the significance of maintaining integrity and accountability in their work.	L2 & L3
5	Familiarity with Quality Assurance: Students will be acquainted with quality assurance principles and practices in aerospace manufacturing. They will learn how to perform inspections, conduct measurements,	L2

interpret specifications, and ensure compliance with industry standards and regulations.

Table: Mapping Levels of COs to POs / PSOs

COs	Program Outcomes (POs)												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
C01	3	3		2	3							2		3
C02	3	3	2	3	3							2		3
C03	3	3		3	3							1		3
C04	3	3	2	2	3							2		3
C05	3	3			2							1		3

INTRODUCTION TO SPACE TECHNOLOGY

SEMESTER - IV

Subject Code : 22ASE00XX	Credits : 03
Hours / Week : 03 Hours	Total Hours : 39 Hours
L-T-P : 3-0-0	

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course, the student will be able to:		
1	Explain the fundamental concepts and principles of space technology. They will understand the basic principles of rocketry, satellite design and operation, space exploration, and the various components and systems used in space missions.	L2 & L3
2	Interpret: Students will develop the ability to interpret and analyze data related to space technology.	L2 & L3
3	Describe: Upon completion of the course, students will be able to describe the different types of space missions and their objectives. They will be familiar with the main types of satellites, such as communication satellites, weather satellites, and scientific satellites, and will understand their specific purposes and functions	L2 & L3
4	Identify and Explain: Students will gain the skills to identify and explain the key components and systems involved in space technology. They will be able to identify the major parts of a rocket and explain their functions.	L2 & L3
5	Describe: Students will be able to describe the impact of space technology on various aspects of human life and society. They will understand how space technology is used for communication, weather forecasting, navigation, Earth observation, and scientific research..	L2

Table: Mapping Levels of COs to POs / PSOs

COs	Program Outcomes (POs)												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3		2	3							2		3
CO2	3	3	2	3	3							2		3

AIRCRAFT PROPULSION

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER - IV

Subject Code :	Credits : 03
Hours / Week : 03 Hours	Total Hours : 39 Hours
L-T-P-S : 3-0-0-0	

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course, the student will be able to:		
1	Determine the performance characteristics of turboprop, turbojet and turbofan engines	L2 & L3
2	Calculate pressure and temperature changes across the propulsive device, inlet, and exhaust nozzle in a gas turbine engine from the knowledge of geometry.	L2 & L3
3	Compare different types of power plant installations in an aircraft.	L2 & L3
4	Outline the requirements of combustors and compare performance of different types of combustors.	L2 & L3
5	Determine the performance characteristics of centrifugal and axial flow compressors	L3 & L4
6	Determine the performance characteristics of axial flow turbines.	L3 & L4

Table: Mapping Levels of COs to POs / PSOs															
COs	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	1	1	2								3		
CO2	3	3	1		1								2		
CO3	2	1											1		
CO4	2						2						2		
CO5	3	3	2	1									2		
CO6	3	3	2	1									2		

LOW SPEED AERODYNAMICS

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER - IV

Subject Code :		Credits :	03
Hours / Week :	03 Hours	Total Hours :	44 Hours
L-T-P-S :	3-0-2-0		

Table: Mapping Levels of COs to POs / PSOs															
COs	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
C01	3	3											1		
C02	3	3											1		
C03	3	3											1		
C04	3	3											1		
C05	3	3											1		

INTRODUCTION TO COMPUTATIONAL FLUID DYNAMICS

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER – IV

Subject Code :	Credits : 03
Hours / Week : 04 Hours	Total Hours : 26 + 26 Hours
L-T-P : 2-0-2	

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course, the student will be able to:		
1	Outline the CFD solution procedure.	L2 & L3
2	Classify PDEs and derive governing equations- continuity, momentum and energy.	L2 & L3
3	Choose 2D grids for a particular fluid flow problem.	L2 & L3
4	Apply finite difference method and finite volume methods for the discretization of the fluid flow problems.	L2 & L3
5	Use of suitable numerical methods for solving the governing equations in the discretized domain by understanding stability and convergence.	L2 & L3
6	Solve fluid flow and heat transfer problems using CFD software	L2 & L3

Table: Mapping Levels of COs to POs / PSOs

Table: Mapping Levels of COs to POs / PSOs															
COs	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
C01	3				2								2		
C02	3				2								1		
C03	2	2			2							1	1	1	
C04	3	3	2		2									1	
C05	3	2	2		3										
C06	3	2	2	2	3				2	2		2	2	2	

HIGH SPEED AERODYNAMICS

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER - V

Subject Code :	Credits : 03
Hours / Week : 03 Hours	Total Hours : 39 Hours
L-T-P-S : 3-0-0-0	

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course, the student will be able to:		
1	Use isentropic relations to analyze compressible flow through variable area ducts.	L2 & L3
2	Calculate flow properties across a normal shock wave using Rankine-Hugoniot relations.	L2 & L3
3	Solve for compressible flow characteristics with friction and heat transfer.	L2 & L3
4	Analyze oblique shock waves and expansion waves and determine the flow properties across these wave for flow over cones and wedges.	L3 & L4
5	Determine aerodynamic coefficients in supersonic flows	L3 & L4
6	Compare the working of wind tunnels and shock tunnels under various flow conditions.	L2 & L3

Table: Mapping Levels of COs to POs / PSOs																
COs	Program Outcomes (POs)												PSOs			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	3			2									3		
CO2	3	3			2									3		
CO3	3	3			1									2		
CO4	3	2			2									2		

C05	3	3		2	1					1			3	2	
C06	3	2			1					1			2		

AIRCRAFT PERFORMANCE

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER - V

DRIVES AND ACTUATORS

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER – V

Subject Code :	Credits :	03
Hours / Week :	Total Hours :	39 + 26 Hours
L-T-P :	3-0-2	

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Classify fluid power systems and apply Pascal law to determine the pressure variation.	L2 & L3
2	Apply the hydrostatic law with respect to design of hydrostatic circuits.	L2 & L3
3	Analyze hydraulic and pneumatic systems in a aircraft.	L2 & L3
4	Apply the hydrostatic and pneumatic laws to design the circuits.	L2 & L3
5	Evaluate the performance of single and double acting cylinders, pneumatic switches,	L3 & L4

Table: Mapping Levels of COs to POs / PSOs															
COs	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
C01	3	3											1		
C02	3	3			1								1		
C03	3	3			1				3	3			1		
C04	3	3											1		
C05	3	3											1		

ROCKETS AND MISSILES

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER - V

Subject Code :	Credits : 03
Hours / Week : 03 Hours	Total Hours : 39 Hours
L-T-P-S : 3-0-0-0	

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course, the student will be able to:		
1	Classify different launch vehicles and missiles.	L2 & L3
2	Analyze different rocket and missile propulsion systems and compare their performance.	L3&L4
3	Calculate aerodynamic forces and moments on rockets and missiles.	L2 & L3
4	Analysis of trajectories and performance of guided missiles.	L3 & L4
5	Analyze different ground testing facilities used for launch vehicles.	L2 & L3
6	Compare different types of materials used for rockets and missiles.	L3 & L4

Table: Mapping Levels of COs to POs / PSOs															
COs	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	1										3		
CO2	3	2			2								3	2	
CO3	2				2								2	2	
CO4	3	2	1		2					1			2	2	
CO5	2	2					2			1			3		1
CO6	3	1					1			1			2	2	

AVIONICS

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER - VI

Subject Code	:	Credits	:	03	
Hours / Week	:	04 Hours	Total Hours	:	26 + 26 Hours
L-T-P	:	2-0-2			

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Analyse the requirements and specifications for power distribution elements for typical military and civil aircraft. They will be able to draw, interpret and identify the aircraft electrical circuitry with respect to generation, distribution and utilisation.	3
2	Compare and identify the the navigation system - inertial navigation, electronic flight control and fly-by-wire	3
3	Identify and use installed sensors, communication, flight instrument and displays systems in civil / commercial aircraft	3
4	Select and design the digital avionics architectures and systems for control, communication, displays and electronic warfare in military / civil aircraft.	4
5	Identify and select the appropriate avionics system architecture along with applicable standards	4

COs	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	2	1								1	3	2	2
CO2	3	2	1	1								1	3	2	2
CO3	3	2	1	1	2							1	3	2	2

C04	3	2	1	1								1	3	2	2
C05	3	2	1	1								1	3	2	2

CONTROL SYSTEMS

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER – VI

Subject Code :		Credits :	04
Hours / Week :	03 Hours	Total Hours :	39 +26 Hours
L-T-P-S :	3-0-2-0		

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course, the student will be able to:		
1	Apply physical laws to derive transfer function and state space models of mechanical, electrical, thermal and fluid systems.	L3&L4
2	Analyze the time response of I and II order systems for step, ramp and impulse inputs and calculate the transient response specifications.	L3 & L4
3	Compute the stability and relative stability of the control system in the time and frequency domain using Routh stability, root locus, Bode and Nyquist plots.	L3 & L4
4	Design controllers and compensators based on stability and performance requirements.	L3 & L4
5	Analyze the state equations and calculate the controllability and observability of feedback control systems.	L2 & L3
6	Use software tools like MATLAB to do the calculations required for (1) to (5) above, and use graphical documentation for these analyses.	L3 & L4

Table: Mapping Levels of COs to POs / PSOs															
COs	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	1		1							1	3		
CO2	3	3			2								2	1	
CO3	3	3	1		2				1	1			3	1	
CO4	3	3	1	1	2				1	1		1	2	2	1
CO5	3	2											2		

CO6	3	1			3				3	2		2	3	2	2
-----	---	---	--	--	---	--	--	--	---	---	--	---	---	---	---

features · important provisions · other details
 Beijing Convention, 2010 · Introduction: Scope of convention · why was it introduced? · Salient features · important provisions

UNIT - V

05 Hours

Recent developments · Problems in application of Air Laws · Airport management · Technological developments and law · emerging trends in Aviation Law

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Understand process of ethical and moral analysis in decision making scenarios and inculcate ethical behavior as a trait for professional development.	2
2	Apply the knowledge to solve practical problems with regard to personal issues & business enterprises.	3
3	Identify the conflict management in legal perspective and judicial systems pertaining to professional environment; strengthen the ability to contribute to the resolution of human rights & Ragging issues and problems through investigative and analytical skills.	3

CHAIRPERSON
 Dept of Aerospace Engineering
 School of Engineering
 Dayananda Sagar University
 Devarakaggalahalli, Kanakapura Road
 Ramanagara District - 562112

COs	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	1					1		1	1	1		1		
CO2	2	2						1	1	1	1		1		
CO3	3	3					2		2	1	2		1		



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Devarakaggalahalli, Harohalli, Kanakapura Road, Ramanagara District, Karnataka – 562 112

Department of CSE (Data Science)

A.Y: 2023-24

3rd Semester

DATA STRUCTURES

Table: Mapping Levels of COs to POs / PSOs

COs	Program Outcomes (POs)												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
C01	1	1	1	1	1	-	-	-	2	-	-	-	1	-
C02	2	3	3	2	1	-	-	-	2	-	-	-	2	-
C03	2	2	3	1	1	-	-	-	2	-	-	-	2	-
C04	2	2	3	1	1	-	-	-	2	-	-	-	2	-
C05	2	3	3	2	1	-	-	-	2	-	-	-	2	-

DIGITAL LOGIC DESIGN

Table: Mapping Levels of COs to POs / PSOs

Cos	Program Outcomes (POs)												PS Os		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
C01	3	-	1	-	-	-	-	-	-	-	-	-	1	-	-
C02	3	2	1	2	3	-	-	-	-	-	1	1	2	1	-
C03	3	2	3	1	2	-	-	1	-	-	1	1	2	1	-
C04	3	3	2	2	3	1	-	1	1	1	2	1	2	2	1
C05	3	3	2	2	3	1	-	1	1	1	2	1	2	2	1
C06	3	3	2	2	3	1	-	1	1	2	2	2	2	1	2

5th Semester

Database Management Systems

Table: Mapping Levels of COs to POs / PSOs														
COs	Program Outcomes (POs)												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	2	2	3	3							2	2	
CO2	2	2	2	1	3							2	2	
CO3	2	2		2									2	
CO4		2	2	2								2	2	
CO5		2			2							2	2	

Machine Learning tools and techniques

Course Outcomes (COs)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	3	3	-	-	2	-	-	-	-	-	-	2	2	2
CO2	2	3	-	-	3	-	-	-	-	-	-	3	3	3
CO3	3	3	-	-	3	-	-	-	-	-	-	3	3	3
CO4	3	3	-	-	2	-	-	-	-	-	-	3	3	3
CO5	3	3	-	-	3	-	-	-	-	-	-	3	3	3

Object Oriented Programming with Java

Table: Mapping Levels of COs to POs / PSOs														
COs	Program Outcomes (POs)												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2											2	2	
CO2	2	2	2	2								2	2	
CO3	2	2	1	2								2	2	
CO4	2	2	2	2								2	2	
CO5	2	2	2	1								2	1	

Link for Proof

<https://drive.google.com/drive/u/0/folders/1Lo3N9jNZXFD6Z2TvUeezC4XdS2SmXyBE>

21CS2304	Full Stack Development : FSD	CO1: Use the common HTML5 elements(tags) and CSS3 operations (styling properties) to interpret the fundamental of web page technologies	2	2	2	2								2	2		
		CO2: Apply Cascading Style Sheets and HTML5 elements for visual presentation and design well-structured web pages.	2	2	2	2									2	2	
		CO3: Implement the JavaScript programming concepts to develop client-side scripts and display the contents dynamically.	2	2	2	2										2	2
		CO4: Develop dynamic server-side applications by employing Node.js event-driven, non-blocking I/O model and its integration with Mongo dB to work with dynamic schemas.	3	3	3	2										2	2
		CO5 :Utilize the Node.js framework-Express.js basic concepts and middleware to construct web applications more efficiently and intelligently,	3	3	3	2										2	2

		physical computing device is capable of doing.															
21CS2405	Software Engineering And Project Management	CO1:Classify among types of software systems and stages for software process framework as well as Capability Maturity Model Integration	2		2				2						2		
		CO2:Apply new software models, techniques and technologies to bring out innovative and novelistic solutions for the growth of the society in all aspects and evolving into their continuous professional development	2	2	2		2		2						2		
		CO3:Given a problem, classify among the type of computing requirements appropriate to its solution	2	2	3		2		2							2	
		CO4:Classify among varied test techniques used for testing as well as build test plans for computer engineering problems.					2			2						2	
		CO5Apply Project Management principles to identify the risks and cost-benefit.					2			2					3	2	

		CO4: Implement various IPC mechanisms (pipes, FIFOs, message queues, semaphores, and shared memory) to develop interprocess communication solutions.	2	3	3	3	3									
		CO5: Analyze the concepts of sockets and utilize socket programming to develop robust. client/server applications and implement communication solutions that enable effective data exchange and interaction over a connection-oriented and connectionless network.	2	3	3	3	2									
21CS2407	Design And Analysis of Algorithms Lab	CO1: Write programmes to solve problems using appropriate design techniques such as divide and conquer, greedy, dynamic programming, and backtracking. Examine the performance of algorithms.	3	3	3							3		2		
		CO2: Utilize acquired algorithm design techniques and data structures effectively to address real-world problems through practical implementation.	3	3	3							3		2		

21CS2408	Microprocessors Laboratory	CO1: Implement 8086 assembly language programs for microprocessor application using 8086 training boards	2	3													
		CO2: Implement 8086 assembly language programs for microprocessor application using assembler and debuggers	2	3	3	3											
		CO3: Design interfacing of various peripherals with 8086 microprocessors for simple applications	2	3	3	3											
		CO4: Use Macros and Procedures in 8086 Programs	2	3	3	3											
		CO5: Use assembly language and debugging tools when writing programs for a microprocessor	2	3	3	3											
		CO6: Communicate effectively on the work done in the laboratory using formal report	2	3													

21CT2401	Small E-Business Launch (SEBL)	CO1: Identify customer needs and pain points	2	3										2				
		CO2: Generate concept & validate idea	3	2	2										1		2	
		CO3: Use design thinking to create a wireframe of your online service	2	2	2											1		2
		CO4: Launch your App/Website	3	2	2											2		2
		CO5: Register your small business	3	2												1		2
21CS2410	Liberal Studies – II	CO1: Develop the ability to think critically, analyze information, and make reasoned judgments, fostering intellectual curiosity and open-mindedness	3	3	3	3						3	3		2			
		CO2: Emphasize effective written and oral communication, enabling students to express their ideas clearly and persuasively.	3	3	3	3							3	3		2		

20CS3502	Design and Analysis of Algorithm (DAA)	CO1:Exemplify and analyze recursive and non recursive algorithms to obtain best, average, worst-case time and space complexity of algorithms using asymptotic notations.	2	3	2									2			
		CO2: Interpret the brute-force, divide-and-conquer paradigm, employ this paradigm to synthesize divide and-conquer algorithms and solve recurrences describing the performance of divide-and-conquer algorithms.	2	2	2										2		
		CO3Demonstrate the Decrease and Conquer, Transform and Conquer algorithm design techniques and analyze the performance of these algorithms .	3	2		2										2	
		CO4:Identify and interpret the greedy technique, dynamic programming paradigm, recite algorithms that employ this paradigm and synthesize dynamic-programming algorithms and analyze them.	3	2	2											2	

		CO3:Use the knowledge of synchronization hardware, semaphores, monitors to resolve process synchronization problems.	2	2	2								2	2	
		CO4: Identify the deadlocks using resource allocation graph and resolve the deadlocks using rollback and abort algorithm. Apply Bankers algorithm to ensure system is free from deadlocks.	2	2	2								2	2	
		CO5: Compare and contrast various memory management schemes to implement the virtual address and provide the memory protection	2	2	2								2	2	
		CO6: Examine the various file management techniques, disk scheduling methods for efficient resource utilization. Interpret system, network, program threats and employ protection principles to safeguard the system resources.	2	2									2	2	
20CS3504	Machine Learning(ML)	CO1: Describe the basic concepts and different types of Machine Learning	3	3						2	2	2		2	

20CT3501	Product Engineering and Entrepreneurship (P&E)	CO1: Identify customer needs and pain points	3	3	3	3											3	
		CO2: Generate concept & validate idea	3	3	3	3												3
		CO3: Use design thinking to architect a product	3	3	3	3												3
		CO4: Create a new product/prototype	3	3	3	3												3
		CO5: Pitch the product to Incubation Centres @ DSU	3	3	3	3												3
20CS3505	DAA Lab	CO1: Design and develop the Algorithms to understand the different concepts.	3	3	3	2	2							2	3	2		
		CO2: Apply the Design principles and concepts to Algorithmic design	3	3	3	2	2							2	3	2		
		CO3: Describe the DAA paradigms and when an Algorithmic Design situation calls for it.	3	3	3	2	2							2	3	2		
		CO4: Analyse worst-case and best – case running times of algorithms using asymptotic analysis.	3	3	3	2	2							2	3	2		

		CO5: Implement an existing algorithm to improve the run time efficiency	3	3	3	2	2						2	3	2	
20CS3506	OS Lab	CO1: Implement System Calls	2	2										2	2	
		CO2: Compare the performance of various CPU Scheduling Algorithms	2	2	2	2								2	2	
		CO3: Analyze Deadlock avoidance and Detection Algorithms	2	2	2	2								2	2	
		CO4: Implement Semaphores	2	2	2	2								2	2	
		CO5: Analyze the performance of the various Page Replacement Algorithms	2	2	2	2								2	2	
		CO6: Implement File Organization and File Allocation Strategies	2	2	2									2	2	
20CT3502	MOOC	CO1: Demonstrate specific skills, such as programming, data analysis, language proficiency, or creative abilities.	3	3	3	3	3	3			3	3		3		

20CS3603	Cloud Application Development (CAD)	CO1: Explain the cloud architecture, different cloud delivery and deployment models and the idea of Virtualization		2	3										3		
		CO2: Construct the Cloud Application and work with the version control tool.		2	3											3	
		CO3: Select the appropriate cloud framework for the development of cloud applications.		2	3											3	
		CO4: Implement cloud-based application by exploring real time methods and tools.		2	3											3	
		CO5: Examine the cloud services offered by various vendors and emerging technologies.		2	3											3	
20CT3605	Block Chain	CO1: Illustrate alternative consensus mechanisms to Bitcoin's Proof-of-work, including Proof-of-Stake, voting-based consensus algorithms, and federated consensus.	3	3	3									2	2		
		CO2: Describe the properties of crypto economics as it relates to its two compositional fields:	3	3	3									2	2		

20CT4703	Big Data Analysis & Deep Learning	CO1:Discuss the fundamentals of big data concepts, such as characteristics and types, as well as how to store and process large-scale datasets using HDFS for data storage and MapReduce for distributed data processing.	3	3	3	3	3					3					
		CO2:Utilize Apache Spark to perform efficient and scalable data processing and analytics tasks, leveraging concepts such as RDDs, DataFrames, shared variables, and key-value pairs to develop distributed data processing solutions.	3	3	3	3	3					3					
		CO3:Explain the fundamentals of deep learning, including neural networks, activation functions, and various types of deep learning models.	3	3	3	3	3					3					
		CO4:Interpret deep learning models for tasks such as image recognition, natural language processing, and data generation.	3	3	3	3	3					3					

		CO5: Interpret AWS database services design principles, framework and protocols of dependable systems and appropriate projects for real-world problems.		3	3	3												
20CT4704	Project Phase -1	CO1: Identify a complex engineering problem that would contribute to resolving societal, health, safety, legal and cultural issues		3	2				3		3	2		2	3			
		CO2: Review research literature in the preferred field of study and be able to define the problem.		3		3					3	2		3	3			
		CO3: Formulate the methodology to carry out the project work	2		3			1	1	2	3	2	2	3	3			
		CO4: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to design a solution using modern tools for the defined problem.	3					2	1	1	2	3	2	2	3	3		
		CO5: Apply Project Management principles to identify the risks and cost-benefit.									2	3	2	3	2	2		

20CT4801	Technology Strategy	CO1: Identify technology strategy approaches, roles and Understand performance dynamics and S-curves for organizations to anticipate technological advancements	3	3	3	3		2	2			2				
		CO2: Discuss the knowledge on strategic frameworks, tools for development of technical strategy.	3	3	3	3		2	2			2				
		CO3: Discuss the nuances of technology strategy using cross-industry examples.	3	3	3	3		2	2			2				
		CO4: Describe awareness on alliances, collaborations & joint ventures as part of technology strategy based on examples.	3	3	3	3		2	2			2				
		CO5: Interpret the importance of establishing strategic alliances within technology ecosystems to gain access to new markets, resources, and knowledge.	3	3	3	3		2	2			2				
20CT4803	Artificial Intelligence As A Service	CO1: Apply graph search algorithms	3	3	3									2		3
		CO2: Derive logical inference from knowledge	3	3	3									2		3

		CO3:Perform adversarial search	3	3	3									2		3	
		CO4: Model bayesian networks & markov models	3	3	3									2		3	
		CO5: Process text using NLP	2	2	3									1		3	
20CT4802	Project Phase -II	CO1: Implement software systems, applications, or tools using appropriate programming languages and methodologies.	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
		CO2: Interpret various technologies, frameworks, or platforms to create a comprehensive solution.	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		CO3: Implement robust testing procedures to ensure the reliability and correctness of their software.	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3



Signature of Chairperson

Chairperson

Dept. of Computer Science & Technology
School of Engineering
Dayananda Sagar University
Kudlu Gate, Hosur Main Road,
Bengaluru-560 114.



DAYANANDA SAGAR UNIVERSITY

COLLEGE OF JOURNALISM AND MASS COMMUNICATION

Criteria 2:

Course outcomes (CO) of all the courses under BA Journalism and Mass Communication and end semester question papers.

Principal
College of Journalism and Mass Communication
Dayananda Sagar University

DEAN
COLLEGE OF JOURNALISM &
MASS COMMUNICATION
DAYANANDA SAGAR UNIVERSITY
Shavige Malleshwara Hills, Kumaraswamy Layout,
BANGALORE - 560 078.

2.6.1. – Course Outcomes

Sl. No	Course	Course Outcomes
1	Journalism Appreciation	Students will be able to demonstrate: 1. Knowledge of the fundamental principles of journalism 2. Understanding of the journalistic process 3. Acquisition of rudimentary journalistic skills
2	Communication Theory	Students will be able to: 1. Apply the underlying core of the communication process - learnt by internalising important theories and models of communication - to communication practice in the future. 2. Build on theory learnt during the course to pursue research in the future.
3	Contemporary Indian History	Students will be able to demonstrate the ability to: 1. Place important events in recent Indian history in their context and demonstrate how they may have a bearing on today's politics, economics and society. 2. Recognize and articulate the diversity of Indian experience in light of its diverse ethnicity, language, gender, as well as political, economic, social, and cultural structures over time and space
4	English Skills	Students will be able to demonstrate the ability to: 1. Think clearly and write effectively in English for the media. 2. Clearly articulate ideas and organise material into an essay, listen to and read material (text and non-text) and summarise it. 3. Use correct grammar for effective communication.
5	Computer tools and design skills for Journalists	Students will be able to demonstrate the ability to: 1. Navigate and collect information from the web 2. Use industry standard software like Photoshop and InDesign 3. Create content for various platforms.

6	Kannada Kali	Students should be able to read, write and communicate in Kannada
7	News Writing and Reporting I	Students will be able to demonstrate: 1. Familiarity with the language of newspapers 2. An understanding of the basics of reporting 3. The ability to independently spot a story idea, identify stakeholders and network and speak with sources to get information to write a report
8	Photography and Videography	Students will be able to demonstrate: 1. The ability to handle a camera properly and click good images 2. Frame and compose shots for video 3. Understand the importance of photography and videography 4. Perform basic editing on photos and videos
9	Political Philosophy	Students will be able to demonstrate the ability to: 1. Discuss, debate and apply the ideas of utilitarianism, liberty, rights, justice, obligation and democracy in understanding day-to-day politics. 2. Ask fundamental questions on how the use of power may have manifested across time 3. Critical, interpretive, and evaluative skills that may be of great value to mass media and democracy.
10	Environmental Studies	Students will be able to demonstrate the ability to: 1. Describe how communication has played a significant role in the framing and discussion of environmental problems and solutions historically. 2. Identify the role of discourse, rhetoric and representation in shaping the way we think about the natural world and the environment.
11	Audio and Video editing Tools	Students will be able to demonstrate: 1. Proficiency in basic audio-video editing tools and techniques for television programs, motion pictures or web applications. 2. The ability to combine basic design principles in video editing

12	Broadcast Media	<ol style="list-style-type: none"> 1. Demonstrate skills required to operate equipment and software for broadcast journalism. 2. Demonstrate news writing, news presentation and interviewing skills. 3. Cover events and news-based stories using mobile phones. 4. Produce news features, news stories and bulletins.
13	Advertising and Public Relations	<ol style="list-style-type: none"> 1. Students will be acquainted with the basics of advertising concepts 2. Students will be able to understand and apply strategic principles to create advertisements using simple tools like Canva 3. Students will be able to plan and execute ad campaigns for ideas, products and services 4. Students will be able to recognize and critique advertisements that do not meet the standard guidelines of ASCI
14	Economics	<ol style="list-style-type: none"> 1. Understand terms necessary for a career in journalism and media 2. Relate the world of business to concepts in economics
15	Digital Journalism and social media	<ol style="list-style-type: none"> 1. Students will be able to work in integrated newsrooms. 2. They will be able to use digital tools to connect, gather, write news and publish online. 3. In particular, students will be comfortable with MoJo.
16	IPR	<ol style="list-style-type: none"> 1. Identify different types of Intellectual Properties (IPs), the right of ownership, scope of protection as well as the ways to create them 2. Recognise the crucial role of IP in organisations of different industrial sectors and media industry 3. Identify activities and constitute IP infringements and the remedies available to the IP owner and describe the precautionary steps to be taken to prevent infringement of proprietary rights
17	Constitution and Public Institutions	<p>Students will:</p> <ol style="list-style-type: none"> 1. Gain an understanding of India's system of government, its constitution and its system of justice. 2. Learn about institutions legislative, executive, judicial and non-governmental in their immediate surroundings. 3. Be able to relate issues to institutions.

18	Digital Media Marketing	<p>Students will:</p> <ol style="list-style-type: none"> 1. Gain an understanding of how digital marketing works. 2. Learn about various marketing tools, strategies and platforms. 3. Be able to work as an independent marketer or work in a media marketing company
19	Sociology	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Understand terms, theories, concepts of basic sociology 2. Learn current issues in sociology with Indian examples 3. Relate issues in journalism to sociology by understanding the social context
20	News Writing and Reporting II	<ol style="list-style-type: none"> 1. Upgrading reporting skills to writing features Understanding how to use numbers in stories 2. Writing different constituents of a package 3. Writing a follow-up story, features and completing a reporting project from start to end
21	Understanding Movies	<p>On completion of this course students will be able to:</p> <ol style="list-style-type: none"> 1. Put to use knowledge of the fundamental elements of cinema in future productions 2. Critically evaluate and appreciate the politics and aesthetics of cinema 3. To be informed about the most important film movements and their influence over the years
22	Kannada Manasu	Students will have better speaking and writing communication skills in Kannada
23	Computer Skills II	<p>Students will:</p> <ol style="list-style-type: none"> 1. Be able to design for print. 2. Have basic knowledge of various audio editing tools. 3. Have hands-on experience in video editing techniques. 4. Be able to create content on various platforms.
25	Political Communication	<p>On completion of this unit, students will be able to:</p> <ol style="list-style-type: none"> 1. demonstrate reasonable ability to apply the course learning to observe, recognise, contextualise and interpret the political nature of communication flows 2. consider the impact of political communication on Indian democracy.

26	Media Laws and Ethics	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Identify issues of ethics in the media. 2. Understand the intricacies of ethics in media. 3. Understand the freedoms of the press and transgressions into it through the study of judgments in many significant cases.
27	Media, Gender and Human Rights	<p>Students will demonstrate -</p> <ol style="list-style-type: none"> 1. Demonstrate adequate skills in listening, speaking, analysing and writing effectively using critical feminist perspectives. 2. Evaluate and interpret information from a variety of sources using rights perspective. 3. Engage in promoting social justice and human rights
28	Multimedia Story Telling	<p>Students will</p> <ol style="list-style-type: none"> 1. Understand how multimedia journalism works 2. Be able to produce content for multimedia platforms 3. Have a clear understanding of the role of interactivity in multimedia storytelling 4. Be familiar with mobile journalism practices 5. Know how to turn a linear series of events into multidimensional experiences
29	Integrated Marketing Communication	<p>At the end of this course, students will be able to</p> <ol style="list-style-type: none"> 1. understand the meaning of an integrated marketing plan 2. understand how an IMC plan works and what makes it work 3. devise IMC campaigns 4. understand the marketing process
30	Global Media and Politics	<ol style="list-style-type: none"> 1. To understand the direction and implications of international communication flows 2. To understand the international debate surrounding the dominant flow 3. To understand the nature of reportage during conflicts involving global powers 4. To understand the linkages of international politics, media conglomerates and global entertainment

31	Editing and Production for Print and Online	<p>Students will be able to demonstrate the ability to:</p> <ol style="list-style-type: none"> 1. Edit routine news agency stories 2. Write headlines for such stories 3. Lay out pages
32	Short Film Production	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate skills of writing well crafted and meaningful scripts before pre production can begin. 2. Organize efficiently equipment and crew before the camera can roll 3. Produce and edit a video that is ready to be seen and experienced by an audience
33	Social Media Marketing	<p>This course enables the students to catch up with the trends and participate in real time NEWS generation and distribution by knowing the technical nuances involved.</p>
34	Development Communication	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Critically analyse selected development initiatives 2. Analyse media for development communication 3. Design media for development communication
35	Communication Research	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Understand the relationship between theory and research methods in the study of communication 2. Critically evaluate communication and other behavioural and scientific research 3. Design and conduct an original communication research project
36	Lab Journal/Bulletin	<p>At the end of the course, students will demonstrate:</p> <ol style="list-style-type: none"> 1. Proficiency in generating story ideas for content – text, graphics and photos - to design and publish a lab journal periodically. 2. Felicity in professional writing and reporting on off campus and on campus stories 3. Proficiency in putting together previously stories into broadcast news programmes.

37	Documentary Production	<p>At the end of the course, students will demonstrate:</p> <ol style="list-style-type: none"> 1. Proficiency in a single-camera electronic field production 2. Their understanding of the nuances involved in different types of documentaries 3. Skills in combining multiple video elements together to enable images and sounds in telling a story.
38	Ad or Corporate Film/Newsletter	<p>The student will demonstrate his/her ability to:</p> <ol style="list-style-type: none"> 1. Create ad films / corporate films all the way from conceptualizing to packaging it. 2. Ability to pitch ideas to potential clients. 3. Potential to create an independent career path in any of the two areas above.
39	Project - Development Communication	<p>The student will demonstrate knowledge of:</p> <ol style="list-style-type: none"> 1. Research designs and the research process by planning, executing and presenting a research study in development communication 2. Planning, executing and presenting a development communication campaign and submit a research report evaluating its impact
40	Media and Cultural Studies	Students will have a critical perspective on media, culture and society.
41	Media Business	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Understand the business models of media organisations 2. Analyse the firm's position in the market 3. Devise business strategies
42	Media Technology	<ol style="list-style-type: none"> 1. Students will learn the technological aspects of audio-visual media. 2. Students will be able to differentiate between print and electronic media and the techniques used in reporting and writing. 3. Students will leverage digital technology in the practice of journalism. 4. Students will make a connection between new technology and emerging concepts and the core principles of journalism.
43	Design Principles	Students will know the basic elements and principles of design and put them to use across all media forms.

44	Radio News Production	Students will be up-to-date with techniques of radio journalism and production.
45	Television Journalism	Students will be up-to-date with techniques of TV journalism and production.
46	Media Studies	Students will develop an informed and critical understanding of the nature of the media, the messages contained in the media, the techniques used by them, and the impact of these media.
47	Corporate Communication	Students will be familiar with current thinking and developments on corporate communication from both the academic and practitioner worlds.
48	Environment and Public Health	Students would have gained a better understanding of environment and its impact on public health.
49	Technical and Promotional Writing	Students will know writing of different types. Students will be conversant with technical writing, writing promotional material for different media including the Net and advertorials, writing press releases on technology and science.
50	News and Feature Writing	Students will be able to: <ol style="list-style-type: none"> 1. Draw information, recognize newsworthiness and write in depth. 2. Develop their tools of critical thinking in conceptualizing, developing and writing news and feature stories. 3. Use interviewing techniques, investigative research methods and the interpretation of surveys. 4. Access and analyse public records and build stories around them 5. Analyse and practice complex storytelling, including the use of narrative techniques.
51	New Media and Design	Students will know the basic elements and principles of design and learn to put them to use across all media forms.



Department of Mechanical Engineering

2.6.1 The institution has stated learning outcomes (generic and programme specific)/graduate attributes which are integrated into the assessment process and widely publicized through the website and other documents

The institution ensures that stated learning outcomes, including generic and program-specific outcomes, and graduate attributes, are seamlessly integrated into the academic and assessment processes. These outcomes are clearly defined for all courses under each program and are widely publicized through the institutional website and curriculum documents.

Course Outcomes (COs) are specified in the curriculum and aligned with Program Outcomes (POs). Assessment methods, including internal evaluations and end-semester exams, are designed to map and evaluate these outcomes. Sample question papers demonstrate this integration, with explicit mapping of questions to COs and POs, ensuring that assessments are outcome-driven.

Evidence includes the scheme of curricula with detailed mention of outcomes, COs for all courses, question papers with CO-PO mapping, and assessment schemes. Website screenshots showcasing published learning outcomes and graduate attributes further validate the institution's commitment to outcome-based education.

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

ENGINEERING MECHANICS [As per Choice Based Credit System (CBCS) scheme]			
SEMESTER - I/II			
Subject Code	:	Credits	: 02
Hours / Week	: 02 Hours	Total Hours	: 26 Hours
L-T-P-S	: 2-0-0-0		
Course Outcomes:			
At the end of the course the student will be able to:			
1. Compute Resultant and reactions by principles and resolution of forces in a plane.			
2. Analyse the objects under the action of applied and frictional forces in a plane by equations of equilibrium.			
3. Determine the Moment of Inertia of composite geometrical sections in a plane			
4. Analyse determinate two-dimensional truss by the method of joints and method of section.			
5. Analyse the motion of objects by equations of motion, equations of equilibrium, and Newton's laws of motion and calculate quantities in projectile motion by equations of motion.			

Dr. Mamish Kumar Mishra

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	I/II					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	INTRODUCTION TO MECHANICAL ENGINEERING					
SCHEME OF INSTRUCTION	L	T	P	J	Total Hours	Credits
	2	-	2	-	26(L)+26(P) = 52	3
CO No.	Outcomes					Bloom's Taxonomy Level
CO1	Describe basic concepts of renewable energy resources and power generation					L2
CO2	Distinguish various engineering materials and metal joining techniques					L2
CO3	Demonstrate different modern manufacturing tools and techniques					L3
CO4	Make use of basic concepts of refrigeration and air-conditioning concepts					L3
CO5	Illustrate essential knowledge of basic concepts of mechatronics and robotics					L2
CO 6	Comprehend the important concepts of electric and hybrid Vehicles					L2

CHAIRPERSON

Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakgehalli, Kemakurra Road
Ramanagara District - 562112
Karnataka

KARTHIK S.B



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

ENGINEERING GRAPHICS & DESIGN THINKING					
[As per Choice Based Credit System (CBCS) scheme]					
SEMESTER – I/II					
Course Code	:	23EN1113	Credits	:	02
Hours / Week	:	04 Hours	Total Hours	:	26+26 Hours
Course Outcome	Description				Bloom's Taxonomy Level
At the end of the course the student will be able to:					
1	Make use of instruments, dimensioning & tolerance principles, conventions and standards related engineering drawing				L1
2	Construct orthographic projections of points, lines, planes and solids				L3
3	Develop lateral surfaces of solids and construct isometric projections of solids				L3
4	Apply the design thinking principles for innovative product development				L3
5	Make use of AutoCad for modelling engineering components				L3


Dr. Vinay M S



CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakannanalli, Malakpet Road
Ramangara District - 56
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

TRANSFORMS AND NUMERIAL TECHNIQUES [As per Choice Based Credit System (CBCS) scheme] SEMESTER - III	
Subject Code : 22ME2301	Credits : 03
Hours / Week : 03 Hours	Total Hours : 39 Hours
L-T-P-S : 3-0-0-0	
Course Outcome	Description
At the end of the course the student will be able to:	
1	Apply Laplace transforms and inverse Laplace transforms to solve linear ordinary differential equations with constant coefficients, demonstrating proficiency in system analysis and modelling.
2	Analyze periodic functions using Fourier series and evaluate the convergence properties and precision of the series expansion.
3	Solve problems involving Fourier integrals by applying complex exponential form, Fourier transforms of basic functions, and Fourier sine and cosine transforms.
4	Utilize numerical methods such as Euler's Method, Runge-Kutta 4th order, Adams-Bashforth, and Adams-Moulton Methods to solve differential equations and analyze dynamic systems
5	Apply finite difference methods, including the Crank-Nicolson method and appropriate techniques for hyperbolic PDEs, to solve various types of partial differential equations (PDEs) such as elliptic, parabolic, and hyperbolic equations.


Dr. Shree Nandga



CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakagnalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

ENGINEERING MATERIALS [As per Choice Based Credit System (CBCS) scheme]		
SEMESTER - III		
Subject Code : 22ME2302	Credits : 03	
Hours / Week : 04 Hours	Total Hours : 26+26 Hours	
L-T-P-S : 2-0-2-0		
Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Classify engineering materials based on their crystal structure	L3
2	Calculate the material properties through testing of materials	L3
3	Interpret phase diagram for alloy preparation	L3
4	Analyze the phase diagram, microstructure and the mechanical properties of materials	L3
5	Select material for an application by analysing the requirements with the material properties	L3
6	Develop polymer composites by hand lay-up, vacuum bagging, resin transfer molding and filament winding processes	L4


KARTHIK S.B



CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka




DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

FLUID MECHANICS AND MACHINES [As per Choice Based Credit System (CBCS) scheme]		
SEMESTER - III		
Subject Code	: 22ME2303	Credits : 04
Hours / Week	: 05 Hours	Total Hours : 39+26 Hours
L-T-P-S	: 3-0-2-0	
Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Categorize the fluids based on rheological behavior and also calculate the pressure, velocity and acceleration at a point in a static as well as fluid under motion	L3
2	Apply Bernoulli's equation for a real fluid flowing between two sections for various engineering applications like measurement of discharge and estimation of losses	L3
3	Develop non-dimensional groups for a physical phenomenon dependent on number of variables and also predict different flow regimes possible in case of a fluid -solid interaction based on critical Reynold's number	L3
4	Calculate the power produced/ consumed and efficiencies obtained from a turbine/pump based on the velocity triangles	L3
5	Compute the discharge, losses in a pipe flow and performance of hydraulic machines by conducting experiments	L3


Chairperson (S. Handa)



CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

<u>Machining Process and Metrology</u> [As per Choice Based Credit System (CBCS) scheme]		
SEMESTER - III		
Subject Code : 22ME2304	Credits : 03	
Hours / Week : 04 Hours	Total Hours : 26+26 Hours	
L-T-P-S : 2-0-2-0		
Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Select an appropriate machine tools for various machining operations	L2
2	Compare the non-traditional machining processes for advanced machining applications	L3
3	Illustrate working of CNC machine and perform part programming for 2D milling, and drilling operations	L2
4	Apply measurement standards and system, Comparators and Slip gauges to calculate related errors during measurements.	L3
5	Calculate tolerance, limits of size, fits, gauges and the various design concepts in gauging	L3

KARTHIK S.B

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara Dist. 562112
Karnatak



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

THERMODYNAMICS		
[As per Choice Based Credit System (CBCS) scheme]		
SEMESTER - III		
Subject Code	: 22ME2305	Credits : 03
Hours / Week	: 03 Hours	Total Hours : 39 Hours
L-T-P-S	: 3-0-0-0	
Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Apply laws of thermodynamics in temperature measurement and also calculate work and heat interaction of system with the environment	L2
2	Analyze closed and open system performance using second law of thermodynamics	L3
3	Calculate entropy change of a system and surrounding by undergoing a thermodynamic process	L2
4	Estimate the maximum work potential of energy source based on the laws laid down by thermodynamics	L3
5	Calculate thermodynamic properties of a pure substance in a given state	L3

(Signature)
B. Hanu

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakagalahalli, K. Anakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

COMPUTER AIDED MACHINE DRAWING [As per Choice Based Credit System (CBCS) scheme]		
SEMESTER - III		
Subject Code : 22ME2306	Credits : 03	
Hours / Week : 05 Hours	Total Hours : 65 Hours	
L-T-P-S : 1-0-0-4		
Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Compare the functionality of different tools and features within Fusion 360 for machine assembly requirements.	L3
2	Apply simple and advanced sketching tools and features in Fusion 360 to create precise and complex 2D sketches, considering appropriate sketch entities, dimensions, and constraints.	L3
3	Utilize design constraints and parameters in Fusion 360 to create parametric 3D models, allowing for modification and adaptation of empirical relations.	L3
4	Assess the machine assembly models in Fusion 360, identifying any potential interferences, clashes, or design issues.	L3

Am
Dr. Kinay ms

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY




SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

5	Develop precise and professional manufacturing drawings with appropriate dimensions, annotations, and GD&T symbols using Fusion 360 tools.	L4
---	--	----

PROBABILITY AND STATISTICS		
[As per Choice Based Credit System (CBCS) scheme]		
SEMESTER - IV		
Subject Code	: 22ME2401	Credits : 03
Hours / Week	: 03 Hours	Total Hours : 39 Hours
L-T-P-S	: 3-0-0-0	
Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Apply the principles of probability to solve complex problems in various real-world scenarios.	L2 & L3
2	Solve and compare different probability distributions, including discrete and continuous random variables, in order to make informed decisions and predictions.	L2 & L3


 CHAIRPERSON
 Dept of Mechanical Engineering
 School of Engineering
 Dayananda Sagar University
 Devarakaggalahalli, Banakapura Road
 Ramanagara District - 562112
 Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

3	Apply statistical estimation techniques, such as maximum likelihood estimation and interval estimation, to draw meaningful inferences about population parameters from sample data.	L3
4	Examine hypothesis testing methods, including large and small sample tests, to assess the significance of observed data and draw valid conclusions.	L4
5	Analyze statistical relationships and perform sample tests to assess the Equality of means in different populations, Correlation coefficients between variables to determine the strength and direction of the relationship. Independence of variables using appropriate statistical tests to assess the absence of any relationship.	L4

APPLIED THERMAL SYSTEMS		
[As per Choice Based Credit System (CBCS) scheme]		
SEMESTER - IV		
Subject Code	: 22ME2402	Credits : 03
Hours / Week	: 05 Hours	Total Hours : 39+26 Hours
L-T-P-S	: 3-0-2-0	
Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Calculate work obtained, mean effective pressure and thermal efficiency for Otto, Diesel , Dual and Bryton cycles, Thermal	L3

Dept of Mechanical Engineering
 School of Engineering
 Dayananda Sagar University
 Devarakogalakhalu, K. Nakapura Road
 Ramanagara District - 502112
 Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

	efficiency of Basic, modified , reheat and regenerative Rankine cycles	
2	Calculate the work done and efficiency for single stage and multistage compressor	L3
3	Analyze different refrigeration and air-conditioning cycles	L3
4	Analyze combustion thermodynamics of fuels	L3
5	Estimate the properties of fuels and lubricants like flash and fire point, viscosity and calorific value.	L3
6	Predict I C engine performance parameters at different operating conditions and also to carry out heat balance	L4

(Signature)
 (Committee B. Hindi)

KINEMATICS AND DYNAMICS OF MACHINES [As per Choice Based Credit System (CBCS) scheme]		
SEMESTER - IV		
Subject Code	: 22ME2403	Credits : 03
Hours / Week	: 03 Hours	Total Hours : 39 Hours
L-T-P-S	: 3-0-0-0	
Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Analyze and interpret the behaviour of kinematic mechanisms to understand their motion characteristics	L3

(Signature)
 Dept of Mechanical Engineering
 School of Engineering
 Dayananda Sagar University
 Devarakavalhalli, Bangalore - 560078
 Ramana, Bangalore District



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

2	Apply kinematic principles and concepts to analyze the motion characteristics of mechanical systems and mechanisms.	L3
3	Evaluate the equilibrium of rigid bodies subjected to static and dynamic forces using appropriate	L3
4	Utilize appropriate balancing procedures to determine the magnitude and location of balancing masses	L3
5	Model cam profiles to represent their shape & motion characteristics and estimate the power requirements for governors & gyroscope systems based on input-output specifications.	L3

Mamish
Dr. Mamish Kumar Mishra

MECHANICS OF SOLIDS

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER - IV

Subject Code : 22ME2404	Credits : 03
Hours / Week : 03 Hours	Total Hours : 39 Hours
L-T-P-S : 3-0-0-0	

CHAIRPERSON

Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakagalahalli, Hanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
1	Calculate stress and strain for different geometries under different loading conditions	L3
2	Solve for principal stresses, maximum shearing stress acting on a structural member using analytical and Mohr's circle methods	L3
3	Calculate the stresses and strains associated with thin and thick cylindrical pressure vessels under axial and circumferential loads	L3
4	Construct shear force and bending moment diagrams for statically determinate beams	L3
5	Calculate the shear stress for bodies subjected to torsion and bending stresses for columns	L3
6	Select appropriate failure theory to calculate the safe dimensions of components and structures	

(Signature)

D. P. M. G. BASHIR ASDAQUE

HEAT TRANSFER

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER - IV

Subject Code : 22ME2405

Credits : 04

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER		V					
YEAR		III					
COURSE CODE		21ME3501					
TITLE OF THE COURSE		HEAT TRANSFER					
SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/	Total Hours	Credits
		3	-	2		39+26	
CO No.	Outcomes					Bloom's taxonomy	
C01	Compute temperature distribution and heat flow in steady-state and unsteady-state 1-D heat conduction					L3	
C02	Calculate forced and free convective heat transfer coefficient and rate of heat transfer					L3	
C03	Analyze performance characteristics of heat exchangers					L4	
C04	Calculate radiation heat transfer between objects with simple geometries					L3	
C05	Demonstrate conduction, convection, and radiation heat transfer phenomena through experiments					L2	

Asst. Coordinator (Head)

[Signature]

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER		V					
YEAR		III					
COURSE CODE		21ME3502					
TITLE OF THE COURSE		DYNAMICS OF MACHINES AND MECHANISM					
SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/ Projects	Total Hours	Credits
		2	-	2	-	26+2 6	
CO No.	Outcomes					Bloom's taxonomy Level	
C01	Apply kinematic principles to analyze and describe the motion of machine components accurately.					L3	
C02	Analyze and predict dynamic forces, moments, and torques					L3	
C03	Develop mathematical models to simulate the dynamic behavior of machines and mechanisms.					L4	
C04	Evaluate and optimize mechanical designs to minimize vibrations and oscillations.					L3	
C05	Demonstrate proficiency in utilizing simulation software for dynamic analysis and visualization.					L2	
C06	Integrate dynamic considerations into the design process to create efficient and reliable mechanical systems.					L3	

*Mamidi
Dr. Mamidi R. Mishra*


CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka




DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	V					
YEAR	III					
COURSE CODE	21ME3503					
TITLE OF THE COURSE	Design of Machine Elements					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/ Projects	Total Hours	Credits
	3		-	-	39	3
CO No.	Outcomes					Bloom's Taxon
C01	Analyze the significance of machine design and its impact on safety and reliability.					L 2
C02	Apply stress analysis to machine components and make informed design decisions.					L 3
C03	Design machine components for dynamic loading and estimate fatigue life.					L
C04	Evaluate threaded fasteners and design for static, dynamic, and impact loads.					L 3
C05	Design keys and couplings for power transmission applications					L


Dr. Vinay MS


CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	V					
YEAR	III					
COURSE CODE	21ME3504					
TITLE OF THE COURSE	Digital Manufacturing					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar /Project	Total Hours	Credits
	3		-	-	42	3
CO No.	Outcomes					Bloom's Taxonomy
C01	Apply CAD software to create and modify 3D models for manufacturing purposes.					L 2
C02	Utilize CAM tools to generate toolpaths and optimize machining strategies.					L 3
C03	Perform virtual testing and simulation to validate designs and manufacturing processes.					L 3
C04	Identify opportunities for automation and implement Industry 4.0					L 3
C05	Analyze the benefits and limitations of digital manufacturing methods compared to traditional approaches.					L 3
C06	Develop a practical understanding of additive manufacturing techniques and their applications in various industries.					L 3

Dr. Rajeev K. N. N. N.
Rajeev

[Signature]
CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	V					
YEAR	III					
COURSE CODE	21ME3506					
TITLE OF THE COURSE	Introduction to robotics and Automation					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/P rojects	Total Hours	Credit s
	3	-	-	-	42	3
CO No.	Outcomes					Bloom 's Taxon
C01	Explain the basic principles of Robotic technology configurations, control and programming of Robots					L 2
C02	Describe the concept of Robot kinematics and dynamics, algorithms & analytical approaches					L 2
C03	To choose the appropriate Sensor and Machine vision system for a given application					L 3
C04	Design an industrial robot which can meet kinematic and dynamic constraints.					L 3
C05	Apply the manipulator kinematics and trajectory generation concepts					L

KARTHIK S. R.

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	V					
YEAR	III					
COURSE CODE	21ME3507					
TITLE OF THE COURSE	Additive Manufacturing Technology					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar /Project	Total Hours	Credit s
	23	-	-	-	42	3
CO No.	Outcomes					Bloom's Taxono
C01	Understand the working principles and process parameters of additive manufacturing processes					L 2
C02	Explore different additive manufacturing processes and suggest suitable methods for building a particular component					L 1
C03	Perform suitable Pre & post processing operation based on product repair requirement					L 4
C04	Design and develop a working model using additive manufacturing					L 6
C05	Able to identify, analyze and solve problems related to Additive					L 3

Dr. Rajeev K. Gupta

CHAITAN
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Bengaluru District - 562112



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	V					
YEAR	III					
COURSE CODE	21ME3508					
TITLE OF THE COURSE	Introduction to Hybrid & Electric Vehicles:					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/ Projects	Total Hours	Credit s
	3		-	-	39	3
CO No.	Outcomes					Bloom's Taxono
CO1	Apply knowledge of hybrid, plug-in hybrid, and electric vehicle technologies to differentiate their operational principles and characteristics.					L 2
CO2	Utilize understanding of powertrain components to analyze the integration of electric motors, batteries, and internal combustion engines in vehicle propulsion systems.					L 3
CO3	Apply energy management strategies to optimize power distribution between electric and internal combustion sources, considering driving conditions and					L 3
CO4	Assess the environmental impact of hybrid and electric vehicles by analyzing their contribution to reduced emissions and energy					L 3
CO5	Demonstrate the application of power electronics for efficient energy conversion and management in hybrid and electric vehicle					L 3

[Handwritten signature]

CHAMPAN
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO6	Formulate informed discussions on economic aspects, incentives, and market dynamics related to hybrid and electric vehicles within the context of sustainable transportation solutions.	L 3
-----	---	--------

SEMESTER	V					
YEAR	III					
COURSE CODE	21ME3509					
TITLE OF THE COURSE	REFRIGERATION AND AIR CONDITIONING					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	42	3
CO No.	Outcomes					Bloom's Taxono
CO1	Explain different methods of refrigeration					L2
CO2	Select the suitable refrigerant based on application and environmental consideration					L3

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

C03	Analyse Vapour compression and Vapour absorption refrigeration systems	L4
C04	Apply the knowledge of psychrometric properties and processes for air conditioning	L3
C05	Compute air conditioning loads and Interpret airconditioning methods	L3

SEMESTER	V					
YEAR	III					
COURSE CODE	21ME3510					
TITLE OF THE COURSE	TOOL DESIGN					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar /Project	Total Hours	Credits
	3	-	-	-	42	3
CO No.	Outcomes					Bloom's Taxon
C01	Select appropriate cutting tools required for producing acomponent.					L 2

Dr. Vinay MS

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

C02	Apply design concepts of single point and multi-point cutting tools	L 3
C03	Demonstrate knowledge of various press tools and sheet tool operations.	L 2
C04	Classify and explain various types of injection moulding dies.	L
C05	Analyze and design a jig/fixture for a given simple component	L

SEMESTER	V					
YEAR	III					
COURSE CODE	21ME3511					
TITLE OF THE COURSE	Drives & Control systems					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar /Project	Total Hours	Credit s
	3		-	-	39	3
CO No.	Outcomes					Bloom's Taxono

CHAIRPERSON
Dept. of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar /Project	Total Hours	Credit s
		3	-	-	-	42
CO No.	Outcomes					Bloom's Taxonomy Level
C01	To make students familiar with the constructional details of chassis and body.					L2
C02	The student will understand the principle and working of the Torque					L2
C03	The student will know about the Automatic Transmission and					L1
C04	The student will understand the principle and working of the Hydro- Static Drive and Electric Drives.					L2
C05	The student will understand the principle and working of the clutch, gearbox					L2

(Dr. P. M. G. B. ASDAQUE)


CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka

SEMESTER	V
----------	---



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

YEAR	III					
COURSE CODE	21ME3512					
TITLE OF THE COURSE	Electrical Machines and power Systems					
SCHEME OF INSTRUC	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/ Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes					Bloom's Taxono
CO1	Identify and differentiate various types of electrical machines and their components.					L 1
CO2	understand the fundamental principles of transformers, including electromagnetic induction and mutual inductance, and the different types of transformers used in power systems.					L 1
CO3	Utilize basic load flow analysis techniques to determine power distribution and voltage profiles in power systems.					L 3
CO4	Differentiate between alternating current (AC) and direct current (DC) machines in terms of their energy conversion processes.					L 3
CO5	Understand the importance of integrating renewable energy sources in reducing carbon emissions and promoting sustainability.					3 L3


CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

C01	Apply principles of drive systems to analyze and design various types of mechanical and electrical drive setups.	L 2
C02	Implement different control strategies to achieve desired performance characteristics in drive systems.	L 3
C03	Evaluate the impact of drive system components on overall system behavior and efficiency.	L 3
C04	Design and simulate control algorithms for closed-loop drive systems to achieve specific speed, torque, and position requirements.	L 3
C05	Troubleshoot and diagnose issues in drive and control systems, implementing corrective measures as needed.	L 3
C06	Integrate theoretical knowledge and practical skills to optimize drive systems for diverse industrial and technological applications.	L 3

[Signature]
CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka

[Signature]
Dr. Namish Kumar Mishra

SEMESTER	V					
YEAR	III					
COURSE CODE	21ME3513					
TITLE OF THE COURSE	MATERIALS FOR ADDITIVE MANUFACTURING					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/ Projects	Total Hours	Credit s
	3	-	-	-	42	3

[Signature]
CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO No.	Outcomes	Bloom's Taxono
CO1	Determine the appropriate materials for manufacturing process for the product to be made.	L 1
CO2	Analyze the suitability of a manufacturing process to convert the raw material to designed specifications.	L 4
CO3	Developing the material ability and expertise to apply the latest mathematical tools and techniques for computing and engineering	L
CO4	Perform cost analysis for various manufacturing process to minimize the	L
CO5	Application of engineering and technological knowledge to solve a wide	L


KARANIK S-B


CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka

SEMESTER	V
YEAR	III
COURSE CODE	21ME3514
TITLE OF THE COURSE	AUTOMOTIVE CHASSIS & TRANSMISSION SYSTEMS



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	V					
YEAR	III					
COURSE CODE	21ME3515					
TITLE OF THE COURSE	Renewable Energy Sources					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/ Projects	Total Hours	Credits
	3	-	-	-	42	3
C O N	Outcomes					Bloom's Taxonom y Level
C01	To understand importance of solar energy applications					L1
C02	To know the principles of power generation by wind energy					L2
C03	To know ocean energy technologies to harness power					L2
C04	To appreciate the use of hydrogen as renewable energy source					L3
C05	Develop capability to do basic design of bio gas plant					L2


CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka





DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VI					
YEAR	III					
COURSE CODE	21ME3601					
TITLE OF THE COURSE	Machine Design Practice					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	1	2	-	70	4
CO No.	Outcomes					Bloom's Taxono
CO1	Design appropriate drive by analyzing load, speed, and distance parameters to optimize performance					L 3
CO2	Assess the stresses in gear teeth and design for strength using the Lewis equation and form factor.					L 3
CO3	Construct efficient worm gear drives by incorporating strength, dynamic, wear loads, and efficiency factors					L 3
CO4	Analyze the properties of lubricants and their mechanisms in bearing systems.					L 3
CO5	Evaluate the design features clutches and brakes.					L

Joy Mondal
Joy MONDAL

[Signature]
CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VI					
YEAR	III					
COURSE CODE	21ME3602					
TITLE OF THE COURSE	Finite Element Analysis					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/ Projects	Total Hours	Credits
	3		2		70	4
CO No.	Outcomes					Bloom's taxonomy Level
C01	Differentiate between finite difference and finite volume methods and their applications.					L3
C02	Analyze a wide range two-dimensional field problems using finite element techniques					L2
C03	Apply FE techniques to situations involving heat transfer by conduction					L3
C04	Apply FE techniques in structural and solid mechanics					L3
C05	Appreciate the use of higher order elements in FEM and apply the same					L3

(P.M.C. Ashw)
(Dr. P.M.G.B. Ashw VE)

(Signature)
CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER		VI					
YEAR		III					
COURSE CODE		21ME3603					
TITLE OF THE COURSE		CONTROL SYSTEMS ENGINEERING					
SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	nar/Proje	Total Hours	Credits
		3	-	2		65	
CO No.	Outcomes					Bloom's Taxonomy Level	
C01	Apply fundamental control theory principles to model complex mechanical systems using transfer functions and state-space methods.					L3	
C02	Implement time and frequency domain techniques to analyze the stability and performance of control systems.					L4	
C03	Design and tune controllers, such as PID controllers and compensators, to enhance system performance and stability.					L3 5	
C04	Apply root locus and frequency domain methods for the design and tuning of control systems.					L3	
C05	Implement state space analysis to determine system controllability, observability, and stability.					L4	
C06	Use computer software tools, such as MATLAB or Simulink, to simulate and analyze the behavior of control systems.					L3	

(Dr. P. M. G. B. ASDARVE)

(Signature)
CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER		VI					
YEAR		III					
COURSE CODE		21ME3605					
TITLE OF THE COURSE		ROBOT KINEMATICS AND DYNAMICS					
SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar /Projects H	Total Hours	Credits
		3	-	-	-	42	3
CO No.	Outcomes					Bloom's Taxonomy Level	
C01	To control both the position and orientation of the tool in the three dimensional space.					L2	
C02	The relationship between the joint variables and the position and the orientation of the tool.					L2	
C03	Planning trajectories for the tool to follow on order to perform meaningful tasks.					L3	
C04	To precisely control the high speed motion of the system.					L3 ⁵	
C05						L3	

Jay Madal
Dr. Joy Mondal

CHADDERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VI					
YEAR	III					
COURSE CODE	21ME3606					
TITLE OF THE COURSE	INDUSTRIAL AUTOMATION-I					
Scheme of Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/ Projects	Total Hours	Credits
	3	-	-	-	42	3
CO No.	Outcomes					Bloom's Taxonomy Level
CO1	Understand the concept of Industrial automation					L2
CO2	Illustrate the computer based industrial automation					L3
CO3	Develop automation systems for manufacturing and process industries					L4
CO4	Demonstrate the use of robotics in industrial automation					5 L2


Dr. Rahul Kumar


CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VI					
YEAR	III					
COURSE CODE	21ME3607					
TITLE OF THE COURSE	COMPUTATIONAL TOOLS FOR ADDITIVE MANUFACTURING					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	48	3
CO No.	Outcomes				Bloom's Taxonomy Level	
CO1	Students will be able to understand and use fundamental computer graphics in the context of design and additive manufacturing				L2	
CO2	Students will be able to develop geometric models both parametric and organic using computational geometry techniques				L3	
CO3	Students will be able to analyze many instances of recent computational fabrication systems that seamlessly blend parametric modeling, slicing and optimization				L3	
CO4	In the second part of the semester, students work in groups on large open-ended projects				L1	
CO5	Students will be introduced to case studies of latest research papers in the field of additive manufacturing				L2	

Dr. Rajeev kr. Gupta
Rajeev

Rajeev
CHANDRASEKAR
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VI					
YEAR	III					
COURSE CODE	21ME3608					
TITLE OF THE COURSE	HEV / EV SYSTEM DESIGN ARCHITECTURE					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/ Projects	Total Hours	Credits
	3	0	0	-	42	3
CO No.	Outcomes					Bloom's Taxonomy Level
CO1	Students will be able to Explain the basics of electric and hybrid electric vehicles, their architecture, technologies and fundamentals					L1
CO2	Analyse the use of different power electronics devices and electrical machines in hybrid electric vehicles					L3
CO3	Explain the use of different energy storage devices used for hybrid electric vehicles, their technologies and control and select appropriate technology					5 L1
CO4	Interpret working of different configurations of electric vehicles and its components, hybrid vehicle configuration, performance analysis					L2

Mohamish
Dr. Mohamish K. Mishra

CHANDRAN
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO5	Understand Energy Management strategies in HEVs	L1
-----	---	----

SEMESTER		VI					
YEAR		III					
COURSE CODE		21ME3609					
TITLE OF THE COURSE		NOISE, VIBRATION AND HARSHNESS					
SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/ Projects	Total Hours	Credits
		3	--	-	-	42	3
CO No.	Outcomes					Bloom's Taxonomy Level	
CO1	Explain the fundamentals of sound and its measurement.					L2	
CO2	Demonstrate of FEA tools solve dynamic problems for vibration.					L3	
CO3	Execute forced harmonic and transient dynamic response studies by using dampening methods.					L2	
CO4	Apply the knowledge ssources of vehicle vibration and vibration isolation techniques.					L3	
CO5	Develop knowledge on advanced topics in finite element based NVH optimization					L3	

Joy Mondal
Dr. Joy Mondal

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VI					
YEAR	III					
COURSE CODE	21ME3610					
TITLE OF THE COURSE	Experimental Methods for Mechanical Engineers					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar /Project	Total Hours	Credits
	3	-	-	-	4	3
CO No.	Outcomes					Bloom's Taxonomy Level
CO1	Compare and contrast different experimental design methods and their applications.					L3
CO2	Critically assess experimental designs and propose modifications for enhanced outcomes					L2
CO3	apply statistical tools, such as mean, standard deviation, and hypothesis testing, to analyze experimental data critically					L3

(Pmk)
97810
(Dr. P. M. h. B.
ASDAQVE)


CHANDRASEKHAR
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

C04	Synthesize experimental data, simulations, and literature to propose innovative solutions.	L3
C05	Develop effective communication of experimental procedures and outcomes in written reports.	L3


CHAIRPERSON
 Dept of Mechanical Engineering
 School of Engineering
 Dayananda Sagar University
 Devarakaggalahalli, Kanakapura Road
 Ramanagara District - 562112
 Karnataka

SEMESTER		VI					
YEAR		III					
COURSE CODE		21ME3611					
TITLE OF THE COURSE		Rapid tooling and industrial Applications					
SCHEME OF INSTRUCTION		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/ Projects Hours	Total Hours	Credits
		3	-	-	-	42	3
CO No.	Outcomes					Bloom's Taxonomy Level	


CHAIRPERSON
 Dept of Mechanical Engineering
 School of Engineering
 Dayananda Sagar University
 Devarakaggalahalli, Kanakapura Road
 Ramanagara District - 562112
 Karnataka

Abhithan



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO1	Describe the specific product types for which each rapid tooling method is suitable.	L1
CO2	Describe how the various steps in rapid tooling processes contribute to the overall efficiency and accuracy.	L2
CO3	List the key characteristics that define an agile manufacturing approach..	L3
CO4	Demonstrate the ability to identify specific manufacturing scenarios where rapid tooling may face obstacles.	L3
CO5	Describe the variables that influence the selection of a specific rapid tooling method for a given product.	L2

Dr. Vinay MS

CHAMPAN
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka

SEMESTER		VI					
YEAR		III					
COURSE CODE		21ME3612					
TITLE OF THE COURSE		FUNDAMENTALS OF DRIVES AND DC MACHINE MODELLING					
SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/ Projects	Total Hours	Credits
		3	--	-	-	42	3
CO No.	Outcomes					Bloom's Taxonomy Level	
CO1	Understand the foundational concepts of drive systems, including power electronics and motor control principles.					L2	
CO2	Analyze the operation and behavior of DC machines in various load conditions.					L3	

Dr. Vinay MS

CHAMPAN
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO3	Apply different control strategies to electric drives for achieving desired performance characteristics.	L2
CO4	Model and simulate DC machines to predict and analyze their behavior under different operating conditions.	L3
CO5	Evaluate the interaction and function of drive system components, such as power converters and sensors, in achieving efficient operation.	L3

[Signature]
CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka

SEMESTER	VII					
YEAR	IV					
COURSE CODE	20ME4701					
TITLE OF THE COURSE	CONTROL SYSTEMS ENGINEERING					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	2	-	65	4
CO No.	Outcomes					Bloom's Taxonomy Level
CO1	Apply fundamental control theory principles to model complex mechanical systems using transfer functions and state-space methods.					L3

[Signature]
CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO2	Implement time and frequency domain techniques to analyze the stability and performance of control systems.	L4
CO3	Design and tune controllers, such as PID controllers and compensators, to enhance system performance and stability.	L3
CO4	Apply root locus and frequency domain methods for the design and tuning of control systems.	L3
CO5	Implement state space analysis to determine system controllability, observability, and stability.	L4
CO6	Use computer software tools, such as MATLAB or Simulink, to simulate and analyze the behavior of control systems.	L3

Dr Mamid K. Manjunath

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka

SEMESTER	VII					
YEAR	IV					
COURSE CODE	20ME4703					
TITLE OF THE COURSE	INDUSTRIAL AUTOMATION – II					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Implement advanced Industrial IoT (IIoT) concepts, including cloud and edge computing solutions, in modern industrial automation setups.	L4
CO2	Use knowledge of vision systems and sensors to analyze their role and effectiveness in automation processes.	L3
CO3	Apply principles of advanced robotics, including robot kinematics, dynamics, trajectory planning, and multi-robot systems, to enhance automation efficiency.	L3
CO4	Develop machine learning models to solve automation problems and use artificial intelligence techniques to optimize industrial processes.	L4
CO5	Assess the implications of Industry 4.0 principles and digital twin technology in the digital transformation of manufacturing.	L3
CO6	Utilize advanced simulation and modeling techniques to design and improve automated systems.	L3

Dr. Rajeev K. Gupta

Rgub

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka

SEMESTER	VII
YEAR	IV
COURSE CODE	20ME4704
TITLE OF THE COURSE	AUTOMATION SYSTEM DESIGN



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
		3	-	-	-	39	3
CO No.	Outcomes						Bloom's TaxonomyLevel
CO1	Apply the fundamental concepts of automation system design to develop efficient automated solutions.						L3
CO2	Design automated manufacturing systems, including work cells and assembly lines, while considering factors like assembly, testing, and inspection.						L4
CO3	Utilize different types of material handling and storage systems, including automated guided vehicles, conveyors, and automated storage and retrieval systems.						L3
CO4	Implement control systems like programmable logic controllers (PLCs), Distributed Control Systems (DCS), and Supervisory Control and Data Acquisition (SCADA) in automation system design.						L4
CO5	Use simulation techniques effectively for understanding the behavior of automated systems.						L3
CO6	Apply optimization methods to improve the efficiency and productivity of automated systems.						L3


CHANDERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka

Abhijit

SEMESTER	VII
YEAR	IV
COURSE CODE	20ME4705



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

TITLE OF THE COURSE		INDUSTRY 4.0 and IOT					
SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
		3	-	-	-	39	3
CO No.	Outcomes					Bloom's Taxonomy Level	
CO1	Apply the concepts of Industry 4.0 and Internet of Things (IoT) to understand and address industrial challenges.					L3	
CO2	Utilize key Industrial IoT (IIoT) technologies such as sensors, actuators, embedded systems, and wireless communication in industrial settings.					L4	
CO3	Design and implement cyber-physical systems and digital twin technology in industry-related projects.					L3	
CO4	Leverage data analytics, machine learning, and AI to solve complex industrial problems and optimize manufacturing processes.					L4	
CO5	Identify common cybersecurity threats in Industry 4.0 and propose strategies to protect industrial systems.					L3	
CO6	Analyze and evaluate the impact of Industry 4.0 and IoT on the future of manufacturing and industrial operations.					L3	


CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka
AKA
Abhijit-N



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VII					
YEAR	IV					
COURSE CODE	20ME4706					
TITLE OF THE COURSE	CAD/CAM for AM					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes					Bloom's Taxonomy Level
CO1	Apply fundamental and advanced CAD/CAM concepts in the context of additive manufacturing.					L3
CO2	Utilize advanced CAD techniques to design complex 3D models tailored for additive manufacturing processes.					L4
CO3	Plan and execute CAM processes for additive manufacturing, including toolpath generation, process parameter selection, and slicing algorithms.					L3
CO4	Implement post-processing methods in additive manufacturing and validate the quality of printed parts through non-destructive testing, dimensional inspection, and mechanical testing.					L4
CO5	Understand and apply the principles of additive manufacturing in various industrial applications.					L3
CO6	Analyze and critique real-world case studies where CAD/CAM is effectively used in additive manufacturing scenarios.					L3

Joy Mondal
Dr. Joy Mondal


CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VII					
YEAR	IV					
COURSE CODE	20ME4707					
TITLE OF THE COURSE	VEHICLE DYNAMICS AND ADVANCED POWERTRAIN					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes					Bloom's Taxonomy Level
CO1	Apply fundamental principles of vehicle dynamics to analyze and address real-world problems related to forces, moments, tire dynamics, and vehicle motion.					L3
CO2	Implement concepts of vehicle ride comfort and handling in the design and improvement of suspension systems and vehicle stability controls.					L4
CO3	Design and optimize powertrain systems by considering the role of various components in vehicle performance.					L3
CO4	Incorporate advanced powertrain technologies such as hybrid and electric powertrains, fuel cell technologies, and energy storage systems into vehicle designs.					L4
CO5	Develop strategies for the integration of powertrain systems into the overall vehicle architecture, considering the impacts on vehicle performance.					L3
CO6	Assess and optimize the role of powertrain systems in emissions and fuel economy, employing sustainable practices in powertrain design.					L3

Joy Mondal

Dr. Joy MONDAL


CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VII					
YEAR	IV					
COURSE CODE	20ME4708					
TITLE OF THE COURSE	ADVANCED ENERGY STORAGE					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes					Bloom's Taxonomy Level
CO1	Apply knowledge of various energy storage systems.					L3
CO2	Evaluate mechanical and thermal energy storage systems.					L4
CO3	Design electrochemical energy storage systems.					L3
CO4	Implement emerging energy storage technologies in practical scenarios.					L4
CO5	Assess integration strategies for energy storage.					L3
CO6	Formulate energy storage management plans.					L3

(P.M.G.B.)
(Dr. P. M. G. B.)
ASDAQVE

(Signature)
CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VII					
YEAR	IV					
COURSE CODE	20ME4709					
TITLE OF THE COURSE	COMPUTATIONAL FLUID DYNAMICS					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes				Bloom's Taxonomy Level	
CO1	Solve Fluid Dynamics Problems Using Governing Equations.				L3	
CO2	Implement Finite Difference and Finite Volume Methods.				L4	
CO3	Apply Finite Volume Method for Convection Diffusion.				L3	
CO4	Perform Flow Field Analysis.				L4	
CO5	Utilize Turbulence Models.				L3	
CO6	Generate Mesh for CFD Analyses.				L3	

(Signature)
Dr. P. M. S. B.
ASDAQVE

(Signature)
CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER		VII					
YEAR		IV					
COURSE CODE		20ME4710					
TITLE OF THE COURSE		OPERATIONS MANAGEMENT					
SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
		3	-	-	-	39	3
CO No.	Outcomes				Bloom's Taxonomy Level		
CO1	Apply Principles of Operations Management.				L3		
CO2	Utilize Process Analysis and Improvement Techniques.				L4		
CO3	Optimize Supply Chain and Logistics Management Strategies.				L3		
CO4	Implement Capacity and Production Planning Techniques.				L4		
CO5	Execute Effective Project Management.				L3		
CO6	Implement Operations Management in Service Sector.				L3		

Dr. Renuk Kumar

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER		VII					
YEAR		IV					
COURSE CODE		20ME4711					
TITLE OF THE COURSE		Robot Vision Systems					
SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
		3	-	-	-	39	3
CO No.	Outcomes				Bloom's Taxonomy Level		
CO1	Implement Image Processing Techniques in Robot Vision Systems.				L4		
CO2	Develop Object Detection and Recognition Algorithms.				L3		
CO3	Apply 3D Vision Techniques in Robotics.				L3		
CO4	Design and Implement Navigation and Mapping Systems.				L3		
CO5	Develop Vision-Based Grasping and Manipulation Techniques.				L4		
CO6	Integrate Human-Robot Interaction into Robot Vision Systems.				L3		

Dr. Prashant Kumar

SHRIPATILSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Bengaluru



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VII					
YEAR	IV					
COURSE CODE	20ME4718					
Course Name	TRIBOLOGY AND BEARING DESIGN					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes				Bloom's Taxonomy Level	
CO1	Explain the principles of tribology and the significance of friction, wear, and lubrication in mechanical systems.				L2	
CO2	Describe the different types of bearings, their construction, and their applications in various engineering fields.				L2	
CO3	Analyze and evaluate the performance of bearings under different loading conditions and operating environments.				L3	
CO4	Design and select appropriate bearings for specific engineering applications based on performance requirements and constraints.				L3	
CO5	Apply tribological concepts and knowledge to address practical problems related to friction, wear, and bearing design.				L3	

KARTHIK S.B

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

YEAR	IV					
COURSE CODE	20ME4717					
TITLE OF THE COURSE	AUTOMOBILE ENGINEERING					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes				Bloom's Taxonomy Level	
CO1	Analyze Development and Role of Automobile Engineering.				L3	
CO2	Evaluate Clutches, Gearboxes, and Drive Systems.				L3	
CO3	Design Axles, Steering, Suspension, and Brake Systems.				L3	
CO4	Analyze Vehicle Performance and Safety Parameters.				L3	
CO5	Implement Understanding of Vehicle Battery and Accessory Systems.				L4	
CO6	Perform Vehicle Maintenance and Servicing.				L3	

Dr. Vinay MS

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO3	Evaluate the impact of intelligent manufacturing on productivity, quality, and sustainability in industrial contexts.	L3
CO4	Collaborate effectively in teams to solve complex manufacturing problems using intelligent technologies.	L3
CO5	Analyze and optimize robot programs for improved performance.	L3

Dr. Vinay M.S

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka

SEMESTER	VII					
YEAR	IV					
COURSE CODE	20ME4714					
TITLE OF THE COURSE	Powder Metallurgy Manufacturing					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes			Bloom's Taxonomy Level		

Dr. Vinay M.S

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO1	Apply powder metallurgy principles to develop manufacturing solutions for specific industrial applications.	L2
CO2	Design and optimize powder metallurgy processes for enhanced component performance.	L2
CO3	Evaluate the properties and characteristics of powder materials to select appropriate materials for manufacturing.	L3
CO4	Assess the advantages and limitations of powder metallurgy in comparison to traditional manufacturing methods.	L3
CO5	Demonstrate proficiency in fabricating powder metallurgy components and conducting quality control tests.	L3

Dr. Rajeev Kr. Gupta
Rajeev

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka

SEMESTER	VII					
YEAR	IV					
COURSE CODE	20ME4715					
Course Name	Powertrain Integration in Hybrid Electric Vehicles (HEV)					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3

Dr. Rajeev Kr. Gupta
Rajeev

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Understand the fundamentals of hybrid electric vehicle powertrains and their key components.	L2
CO2	Analyze the interactions between different powertrain components in HEVs.	L2
CO3	Design and optimize powertrain systems to achieve desired performance and efficiency in HEVs.	L3
CO4	Evaluate the environmental impact and benefits of integrating specific powertrain technologies in HEVs.	L3
CO5	Apply theoretical knowledge to practical scenarios and problem-solving related to powertrain integration in HEVs.	L3

Dr. Rajeev K. Gupta
Rajeev

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka

SEMESTER	VII
YEAR	IV
COURSE CODE	20ME4716
Course Name	ENERGY MANAGEMENT AND CONTROL STRATEGIES

Dr. Rajeev K. Gupta
Rajeev

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



Department of Mechanical Engineering

SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
		3	-	-	-	39	3
CO No.	Outcomes	Bloom's Taxonomy Level					
CO1	Evaluate energy consumption patterns and identify opportunities for energy conservation in industrial and commercial facilities.	L2					
CO2	Implement and apply advanced energy control strategies, such as demand response, load shedding, and peak shaving, to optimize energy consumption.	L2					
CO3	Analyze the economic feasibility of energy management projects, considering factors such as payback period, return on investment, and cost-benefit analysis.	L3					
CO4	Formulate comprehensive energy management plans tailored to the unique requirements and constraints of different organizations.	L3					
CO5	Demonstrate a thorough understanding of environmental implications related to energy usage and propose strategies to reduce carbon footprint and greenhouse gas emissions.	L3					

Dr. Rajeev K. R. Gupta

Rajeev

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER		VII					
YEAR		IV					
COURSE CODE		20ME4712					
TITLE OF THE COURSE		ROBOT PROGRAMMING					
SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
		3	-	-	-	39	3
CO No.	Outcomes	Bloom's Taxonomy Level					
CO1	Select appropriate programming languages and platforms for specific robotic applications.	L2					
CO2	Design and implement robot behaviors and control strategies using various techniques.	L2					
CO3	Apply behavior-based and reactive approaches to control robots in dynamic environments.	L3					

Dr. Vinay MS

CHAIRPERSON
 Dept of Mechanical Engineering
 School of Engineering
 Dayananda Sagar University
 Devarakaggalahalli, Kanakapura Road
 Ramanagara District - 562112
 Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO4	Create and execute a complete robot programming project, including simulation and testing.	L3
CO5	Analyze and optimize robot programs for improved performance.	L3

SEMESTER		VII					
YEAR		IV					
COURSE CODE		20ME4713					
TITLE OF THE COURSE		Intelligent Manufacturing Systems					
SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
		3	-	-	-	39	3
CO No.	Outcomes	Bloom's Taxonomy Level					
CO1	Analyze real-world manufacturing scenarios and identify opportunities for intelligent system integration.	L2					
CO2	Design and implement intelligent manufacturing solutions using AI, IoT, and robotics technologies.	L2					

Dr. Vinay MS

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VIII					
YEAR	IV					
COURSE CODE	20ME4802					
Course Name	ADVANCED AI FOR ROBOTICS					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes				Bloom's Taxonomy Level	
CO1	Apply Machine Learning Techniques to Robotic Systems.				L3	
CO2	Utilize Computer Vision in Robotics.				L2	
CO3	Implement AI-Based Decision Making and Control.				L4	
CO4	Analyze and Evaluate AI Techniques in Robotics.				L3	
CO5	Design AI Models for Specific Robotic Applications.				L3	
CO6	Apply Advanced AI Concepts in Robotics.				L3	

Dr. VBhuvanesh R

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VIII					
YEAR	IV					
COURSE CODE	20ME4803					
Course Name	ROBOT SIMULATION & OFFLINE PROGRAMMING					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes				Bloom's Taxonomy Level	
CO1	Implement Fundamentals of Robot Simulation.				L4	
CO2	Apply Principles of Offline Robot Programming.				L3	
CO3	Analyze Practical Applications of Robot Simulation.				L3	
CO4	Develop Offline Robot Programs.				L3	
CO5	Utilize Software Tools for Simulation and Offline Programming.				L3	
CO6	Incorporate AI and Machine Learning in Robot Simulation.				L3	

Dr. Shashidhara L.C

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VIII					
YEAR	IV					
COURSE CODE	20ME4804					
Course Name	ADDITIVE MANUFACTURING FOR MEDICAL APPLICATIONS					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes				Bloom's Taxonomy Level	
CO1	Apply Principles of Additive Manufacturing.				L3	
CO2	Select Biocompatible Materials.				L3	
CO3	Implement AM Techniques in Medical Applications.				L4	
CO4	Design Models for Medical AM.				L3	
CO5	Follow Regulatory Guidelines.				L3	
CO6	Analyze Applications of Medical AM.				L3	


KARTHIK S B


CHANNERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VIII					
YEAR	IV					
COURSE CODE	20ME4805					
Course Name	SUSTAINABLE MANUFACTURING					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes				Bloom's Taxonomy Level	
CO1	Assess Impact of Manufacturing Practices.				L3	
CO2	Apply Life Cycle Assessment.				L3	
CO3	Implement Energy Efficiency Measures.				L4	
CO4	Manage and Reduce Waste.				L3	
CO5	Incorporate Sustainable Practices in Supply Chain.				L3	
CO6	Evaluate Sustainable Manufacturing Systems.				L3	

Dr. Shashidhara H.C

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VIII					
YEAR	IV					
COURSE CODE	20ME4806					
Course Name	ADVANCED PROPULSION SYSTEMS FOR HYBRID ELECTRIC DRIVE VEHICLES					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes				Bloom's Taxonomy Level	
CO1	Apply Knowledge of HEDVs.				L3	
CO2	Use Electric Propulsion Systems.				L3	
CO3	Integrate ICE in Hybrid Systems.				L3	
CO4	Implement Energy Storage Systems.				L4	
CO5	Employ Hybrid Energy Management Techniques.				L3	
CO6	Evaluate HEDV Performance.				L3	

Dr. Shashidhara L.C

C. M. SPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VIII					
YEAR	IV					
COURSE CODE	20ME4807					
Course Name	AUTOMOTIVE ELECTRONICS FOR EV'S					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes					Bloom's Taxonomy Level
CO1	Design EV Architecture.					L3
CO2	Apply Power Electronics in EV context.					L3
CO3	Implement Battery Management Systems.					L4
CO4	Employ Control Systems in EVs.					L3
CO5	Develop Telematics and Infotainment Systems.					L3
CO6	Evaluate EV Performance.					L3

Abhilash. O
Abhilash. O

CHAIRPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

SEMESTER	VIII					
YEAR	IV					
COURSE CODE	20ME4808					
Course Name	FEM- STRUCTURAL MECHANICS APPLICATIONS					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3
CO No.	Outcomes					Bloom's Taxonomy Level
CO1	Implement FEM in 1D Problems.					L3
CO2	Apply FEM to 2D Problems.					L3
CO3	Solve 3D Structural Problems.					L4
CO4	Analyze Plate and Shell Structures.					L3
CO5	Perform Non-linear Analysis.					L4

Kailash S.B

CHANDRERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO6	Conduct Fracture and Fatigue Analysis.	L3
-----	--	----

SEMESTER		VIII					
YEAR		IV					
COURSE CODE		20ME4809					
Course Name		ORGANIZATIONAL BEHAVIOUR AND PROFESSIONAL COMMUNICATION					
SCHEME OF Instruction		Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
		3	-	-	-	39	3
CO No.	Outcomes					Bloom's Taxonomy Level	
CO1	Apply concepts of organizational behaviour to real-life business situations.					L3	
CO2	Formulate strategies for effective group dynamics and team development.					L3	
CO3	Implement appropriate leadership styles and decision-making techniques.					L4	
CO4	Demonstrate proficiency in professional communication, both written and oral.					L3	

Joy Mondal
Dr. Joy Mondal

Champerson
CHAMPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



DAYANANDA SAGAR
UNIVERSITY



SCHOOL OF
ENGINEERING

Department of Mechanical Engineering

CO5	Apply problem-solving and negotiation skills in a variety of organizational contexts.	L4
CO6	Design and implement CSR strategies in alignment with organizational objectives.	L3

Jay Mandal
Dr. Jay Mandal


CHARPERSON
Dept of Mechanical Engineering
School of Engineering
Dayananda Sagar University
Devarakaggalahalli, Kanakapura Road
Ramanagara District - 562112
Karnataka



USN No:

**II Semester B. Tech Mid Semester Examination –IDepartment of
Mechanical Engineering**

Course Title: INTRODUCTION TO MECHANICAL ENGINEERING

Course Code: 23EN1104

Duration: 75 Mins.

Date: 04/04/2024

Time: 2.30PM—3.45 PM

Max Marks: 40

Instructions to Candidates:

1. Answer all the five full questions.
2. Each full question carries 10 marks.

Q No.	Question Description	Marks	BT Level	COs	POs
1)	a. Elucidate the basic working principle of Steam power plant with a neat sketch.	06	L 2	CO1	PO1
	b. Classify various energy resources with suitable examples.	04	L 2	CO1	PO6
2)	a. Define Thermodynamics explain the importance of systems and surroundings.	04	L 1	CO1	PO2
	b. State and explain with a diagram the Kelvin-Planck's Statement of 2 nd law of Thermo dynamics .	04	L 2	CO1	PO4
	c. State the Zeroth Law of Thermodynamics	02	L 3	CO1	PO2
3)	a. Carnot heat engine receives 700 kJ of heat per cycle from a high temperature heat reservoir at 752 °C and rejects heat to a low temperature heat reservoir at 30 °C. Determine: (a) The thermal efficiency of this Carnot engine (b) The amount of heat rejected to the low-temperature heat reservoir.	06	L 3	CO1	PO2
	b. Comment on the following engineering materials (i) Mild Steel (ii) Copper.	04	L 1	CO2	PO2
4)	a. How do you classify ceramics material explain any two types with an example	05	L 2	CO2	PO2
	b. Classify composite materials based on the fiber reinforcement phase along with a neat sketch	05	L 3	CO2	PO3



SCHOOL OF ENGINEERING

USN No:

I Semester B.Tech Mid Semester Examination - II

Department of Mechanical Engineering

Course Title: INTRODUCTION TO MECHANICAL ENGINEERING Course Code: 23EN1104

Duration: 75 Mins.

Date: 19/12/2023

Start Time: 2.30—3.45 PM

Max Marks: 40

Instructions to Candidates:

1. Answer all the four full questions.
2. Each full question carries 10 marks.

QNo.		Question Description	Marks	BT Level	COs	POs
1)	a.	Analyze with the help of block diagram the working of CNC Machine Tools.	06	L3	CO3	PO1
	b.	What are the advantages of CNC Machining process?	04	L1	CO3	PO2
2)	a.	Identify the number of technologies that will help enable smart manufacturing systems.	05	L3	CO3	PO5
	b.	Describe the detail step by step process of Reverse Engineering.	05	L2	CO3	PO1
3)	a.	With a neat sketch elucidate the working principal of Stereo lithography Process (SL) in additive manufacturing.	06	L2	CO3	PO8
	b.	How does heat transfer occur in solids, liquids, and gases?"	04	L3	CO4	PO7
4)	a.	List and explain the different types of refrigerant.	04	L2	CO4	PO4
	b.	With a neat block diagram explain the working process of Vapour compression Refrigerator.	06	L2	CO4	PO4





**DAYANANDA SAGAR
UNIVERSITY**



**SCHOOL OF
ENGINEERING**

USN No:

I Semester B. Tech Examinations –January 2024

Course Title: INTRODUCTION TO MECHANICAL ENGINEERING

Course Code: 23EN1104

Duration: 03 Hours

Date: XX-XX-XXXX

Time: 01:30 PM to 04:30 PM

Max Marks: 100

- Note: 1. Answer all Five Full Questions**
- 2. Each Full Question carries 20 Marks**
- 3. Draw neat sketches wherever necessary**
- 4. Missing Data may be suitably assumed**

Q. No.	Question	Marks	BTL	COs	POs
1.a.	What defines an energy source as "renewable"? Give examples of commonly used renewable energy sources.	(06 Marks)	L1	CO1	PO1
1.b.	Describe the process of converting fossil fuels into electricity in a thermal power plant.	(08 Marks)	L2	CO1	PO1
1.c.	Analyze thermodynamic systems through examples and detailed sketches, discussing their specific applications	(06 Marks)	L3	CO1	PO1
2.a.	Distinguish between ferrous metals from non-ferrous metals? Provide examples of each type and discuss their common applications in engineering.	(06 Marks)	L2	CO2	PO2
2.b.	What are the different types of composite materials, and how do they differ in their structural compositions?	(08 Marks)	L2	CO2	PO2
2.c.	How do shape memory alloys differ from conventional metals in their behavior?	(06 Marks)	L3	CO2	PO8
3.a.	What does CNC stand for, and how does it differ from conventional machining methods?	(06 Marks)	L1	CO3	PO3
3.b.	Explain the concept of reverse engineering in the context of additive manufacturing.	(06 Marks)	L2	CO3	PO3
3.c.	Critically assess the working principle of FDM 3D printing, examining its advantages, limitations.	(08 Marks)	L3	CO3	PO3

4.a.	Describe the three main modes of heat transfer relevant to electronic devices.	(06 Marks)	L2	CO4	P04
4.b.	Differentiate between active and passive cooling methods used in electronic devices. Give an example of each.	(04 Marks)	L2	CO4	P07
4.c.	Name two desirable properties of refrigerants and explain their importance in refrigeration systems	(04 Marks)	L2	CO4	P07
4.d.	Explain the principles and operation of a vapor compression refrigeration system.	(06 Marks)	L2	CO4	P04
5.a.	What is mechatronics ? Write the key elements of mechatronics systems with a block diagram.	(10 Marks)	L1	CO5	P05
5.b.	5.b. Briefly discuss the following (iii) Robotics (ii) hybrid vehicle	(10 Marks)	L3	CO5	P09



SCHOOL OF ENGINEERING

USN No:

II Semester B. Tech Mid Semester Examination - I Department of Mechanical Engineering

Course Title: Engineering Mechanics

Course Code: 23EN1106

Duration: 75 Mins.

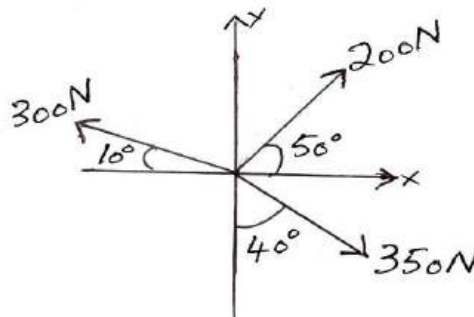
Date: 05-04-2024

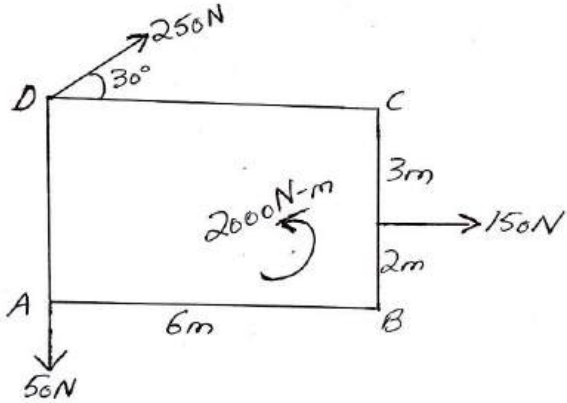
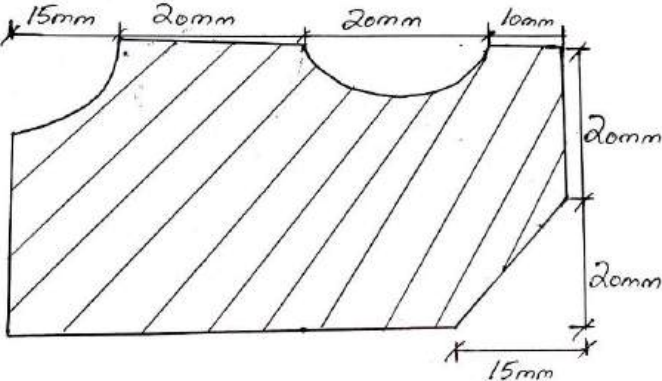
Start Time: 2.30 pm

Max Marks: 40

Instructions to Candidates:

1. Answer all the five full questions.
2. Each full question carries 10 marks.
3. Missing data to be assumed suitably.

Q No.	Question Description	Marks	BT Level	COs	POs
1)	a. Illustrate the Characteristics of couple- moment.	6	L2	CO1	PO1,2
	b. Explain: (i) Physical Independence of forces (ii) Polygonal law of forces	4	L2	CO1	PO1,2
2)	a. Determine magnitude and direction of the resultant force for the concurrent force system shown below and also indicate in which quadrant resultant will act. 	7	L3	CO1	PO1,2,3
	b. List the differences between centroid and centre of gravity.	3	L1	CO2	PO1,2

3)	a	<p>Determine position of resultant with respect to point A for the given non- concurrent force system shown below. Will the resultant intercept the edge AB?</p> 	8	L3	CO1	PO1,2,3
	b	<p>What is meant by equilibrium?</p>	2	L1	CO2	PO1,2,3
4)		<p>Determine centroid of the shaded Lamina for the figure shown below.</p> 	10	L3	CO2	PO1,2,3





SCHOOL OF ENGINEERING

USN No:

II Semester B. Tech Mid Semester Examination - II Department of Mechanical Engineering

Course Title: Engineering Mechanics

Course Code: 23EN1106

Duration: 75 Mins.

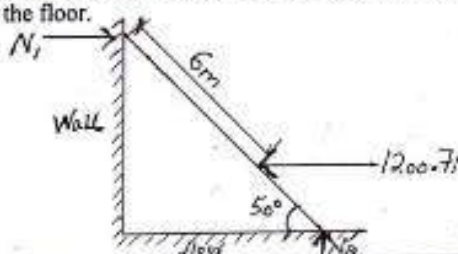
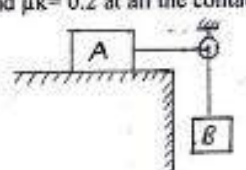
Date: 17-05-2024

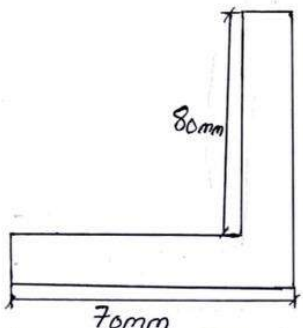
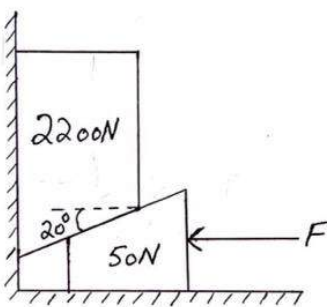
Time: 2.30- 3.45pm

Max Marks: 40

Instructions to Candidates:

1. Answer all the five full questions.
2. Each full question carries 10 marks.
3. Missing data to be assumed suitably.

Q No.	Question Description	Marks	BT Level	COs	POs
1)	a. Explain the following terms:- i) Angle of repose ii) Cone of friction.	5	L2	CO3	PO1,2
	b. Illustrate Perpendicular axis theorem with neat sketch.	5	L2	CO2	PO1,2,3
2)	a. A ladder of 7m length weighing 120kgs is shown below. If a minimum force of 1200.7N is required to push the ladder, Determine the reactions N_1 and N_2 . Take $\mu = 0.2$ at the wall and $\mu = 0.3$ at the floor. 	5	L3	CO3	PO1,2,3
	b. Two blocks A and B weighing 40kgs and 10kgs are connected together by rope and pulley arrangement shown below. Determine whether block B pulls down block A or not. Take $\mu_s = 0.3$ and $\mu_k = 0.2$ at all the contact surfaces. 	5	L3	CO3	PO1,2,3

3)	<p>Determine Polar Moment of Inertia about centroid of an L-section shown below which is having thickness of 10mm.</p> 	10	L3	CO2	PO1,2,3
4)	<p>A block of 2200N is to be raised up by driving a wedge of 50N beneath. Determine the minimum force 'F' required to push the wedge in order to move the block of 2200N upwards. Take $\mu = 0.25$ at all the contact surfaces.</p> 	10	L3	CO3	PO1,2,3



SCHOOL OF ENGINEERING

USN No:

III Semester B. Tech Mid Semester Examination - I

Department of Mechanical Engineering

Course Title: Machining Process and Metrology (MPM) Course Code: 22ME2304

Duration: 75 Mins.

Date: 10/11/2023

Start Time: 2:30PM - 3:45PM

Max Marks: 40

Instructions to Candidates:

4. Answer all the Four full questions.
5. Each full question carries 10 marks.

Q No.		Question Description	Marks	BT Level	COs	POs
1)	a.	Comment on the important limitations of traditional machining process.	05	L3	C02	PO1
	b.	Describe the key classifications of the nontraditional machining process.	05	L2	C02	PO1
2)	a.	Explain the important process involved in the machining of the water jet.	04	L2	C02	PO1
	b.	With the help of a neat sketch, explain the mechanism of material removal in EDM.	06	L1	C02	PO2
3)	a.	Discuss in detail the chip removal process of abrasive jet machining with help of a neat diagram.	05	L2	C02	PO1
	b.	Identify why the CNC machining is necessary in the manufacturing industries.	05	L3	C03	PO2
4)	a.	Analyze the major difference between the CNC machine tools and conventional machine tools	04	L3	C03	PO2
	b.	Discuss with a block diagram the major components of a CNC machining process.	06	L2	C03	PO2





**III Semester B. Tech Mid Semester
Examination -I Department of
Mechanical Engineering**

Course Title: Engineering Materials

Course Code: 22ME2302

Duration: 75 Minutes

Date: 09-11-2023

Time: 02:30 to 03:45 PM

Max Marks: 40

Instructions to Candidates:

- Answer all the four Questions.
- Each question carries 10 marks.

		Marks	BT Level	CO's	PO's																		
Q. 1(a)	Distinguish between homogeneous nucleation and heterogeneous nucleation process with a neat diagram.	05	L4	CO1	PO1																		
Q. 1(b)	Make a comparison between the ductile fracture and brittle fracture in the failure of materials.	05	L3	CO2	PO1																		
Q. 2(a)	Interpret the differences between Charpy and Izod impact tests?	04	L2	CO2	PO1																		
Q. 2(b)	Explain the Hume-Rothery rules for substitutional solid solution.	06	L2	CO1	PO1																		
Q. 3(a)	Elucidate the creep behaviour with a neat diagram.	06	L3	CO2	PO2																		
Q. 3(b)	Describe the Frenkel and Schottky defects with clear diagram.	04	L1	CO1	PO2																		
Q. 4(a)	The fatigue data for a brass alloy are given as follows: <table border="1" style="margin-left: auto; margin-right: auto;"><thead><tr><th>Stress Amplitude (MPa)</th><th>Cycles to Failure</th></tr></thead><tbody><tr><td>310</td><td>2×10^5</td></tr><tr><td>223</td><td>1×10^6</td></tr><tr><td>191</td><td>3×10^6</td></tr><tr><td>168</td><td>1×10^7</td></tr><tr><td>153</td><td>3×10^7</td></tr><tr><td>143</td><td>1×10^8</td></tr><tr><td>134</td><td>3×10^8</td></tr><tr><td>127</td><td>1×10^9</td></tr></tbody></table> <p>(a) Draw stress amplitude (S) versus logarithm cycles to failure (N) plot on graph sheet using the above data. (b) Determine the fatigue strength at 5×10^5 cycles. (c) Determine the fatigue life for 200 MPa.</p>	Stress Amplitude (MPa)	Cycles to Failure	310	2×10^5	223	1×10^6	191	3×10^6	168	1×10^7	153	3×10^7	143	1×10^8	134	3×10^8	127	1×10^9	07	L4	CO2	PO2
Stress Amplitude (MPa)	Cycles to Failure																						
310	2×10^5																						
223	1×10^6																						
191	3×10^6																						
168	1×10^7																						
153	3×10^7																						
143	1×10^8																						
134	3×10^8																						
127	1×10^9																						
Q. 4(b)	Sketch the crystal structure of FCC and calculate its atomic packing factor.	03	L3	CO1	PO2																		



SCHOOL OF ENGINEERING

USN No:

III Semester B.Tech Mid Semester Examination - I

Department of Mechanical Engineering

Course Title: Computer Aided Machine Drawing

Course Code:22ME2306

Duration:75 Mins.

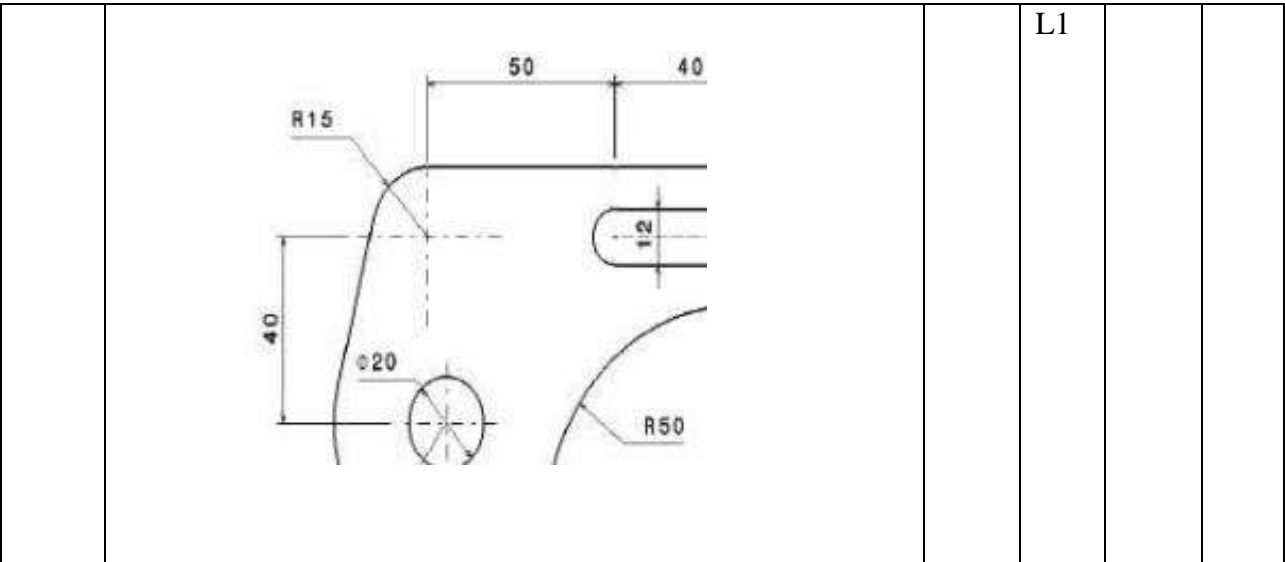
Date:11/11/2023

Time:

Max Marks:40

Answer all the Questions

		Marks	BT Level	Marks	POs
Q.1(a)	Sketch the following Drawing in AutoCAD	10	L1	CO1	PO2
Q.2(a)	Sketch the following Drawing in AutoCAD	10		CO1	PO2



L1

Q.3(a)

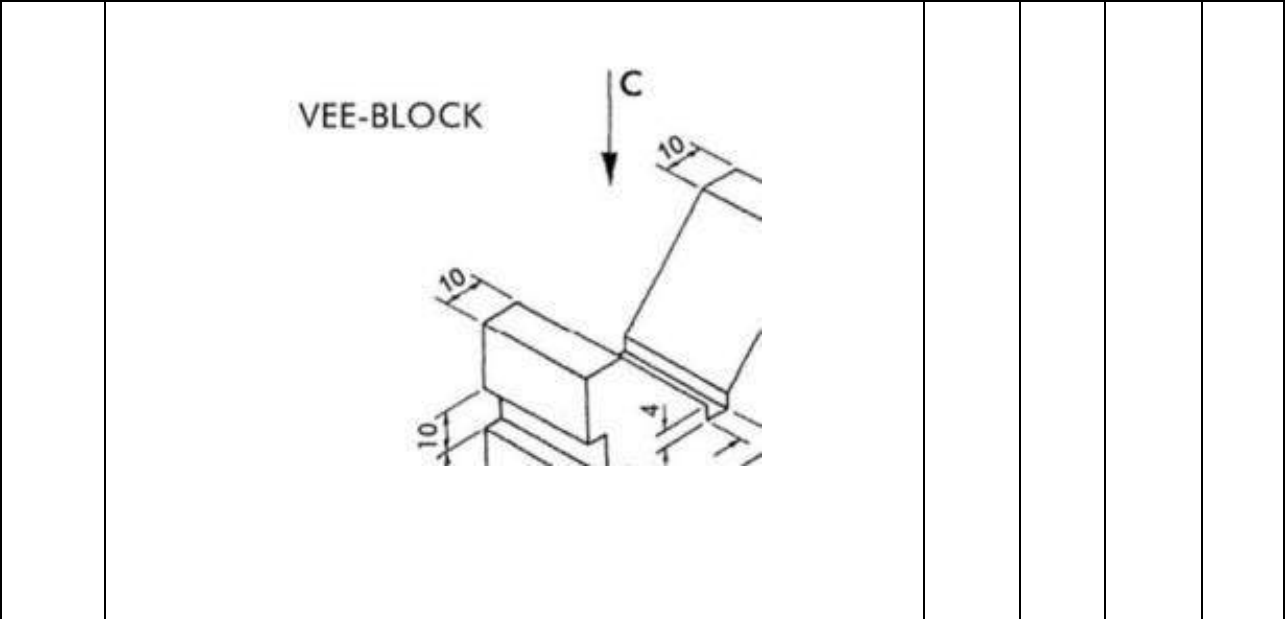
Convert the following 3D drawing to 2D drawing using both Manual sketching and AutoCAD.

20

L2

CO2

PO1





SCHOOL OF ENGINEERING

USN No:

III Semester B. Tech Mid Semester Examination

- I Department of Mechanical Engineering

Course Title: Machining Process and Metrology (MPM) Course

Code: 22ME2304 Duration: 75 Mins.

Date: 10/11/2023

Start Time: 2:30PM - 3:45PM

Max Marks: 40

Instructions to Candidates:

1. Answer all the Four full questions.
2. Each full question carries 10 marks.

QNo.	Question Description	Marks	BT Level	COs	POs	
1)	a.	Comment on the important limitations of traditional machining process.	05	L3	C02	PO1
	b.	Describe the key classifications of the nontraditional machining process.	05	L2	C02	PO1
2)	a.	Explain the important process involved in the machining of the water jet.	04	L2	C02	PO1
	b.	With the help of a neat sketch, explain the mechanism of material removal in EDM.	06	L1	C02	PO2
3)	a.	Discuss in detail the chip removal process of abrasive jet machining with help of a neat diagram.	05	L2	C02	PO1
	b.	Identify why the CNC machining is necessary in the manufacturing industries.	05	L3	C03	PO2
4)	a.	Analyze the major difference between the CNC machine tools and conventional machine tools	04	L3	C03	PO2
	b.	Discuss with a block diagram the major components of a CNC machining process.	06	L2	C03	PO2



SCHOOL OF ENGINEERING

USN

No:

III Semester B.Tech Mid Semester Examination - I Department of Mechanical Engineering

Course Title: Thermodynamics

Course

Code: 22ME2305 Duration: 75 Mins.

Date: 11/11/2023

Start Time: 10.00-11.15

Max Marks: 40

Instructions to Candidates:

1. Answer all the four full questions.
2. Each full question carries 10 marks.

Q No.	Question Description	Marks	BT Level	COs	POs
1)	a. Compare the different types of Thermodynamics systems with suitable examples.	6	L2	CO1	PO2
	b. List the various intensive and extensive properties	4	L1	CO1	PO1
2)	a. Compare the macroscopic and microscopic approach for studying the behaviour of matter	5	L2	CO1	PO2
	b. Illustrate the concept of quasistatic process with suitable example.	5	L2	CO1	PO1
3)	a. Explain the joule experiment for I law of thermodynamics	5	L1	CO2	PO3
	b. A Stationary mass of gas is compressed without friction from an initial state of 0.2 m ³ and 0.105 MPa to a final state of 0.15 m ³ and 0.105 MPa the pressure remaining constant throughout the process. There is a transfer of 37.6 kJ of heat from the gas during the process. How much does the internal energy change.	5	L3	CO2	PO4
4)	a. Demonstrate the steady flow energy equation.	5	L2	CO2	PO3
	b. The internal energy of a certain substance is given by the following equation $u = 3.56 pv + 84$. where u is given in kJ/kg, p is in kPa, and v is in m ³ /kg. A system composed of 3 kg of this substance expands from an initial pressure of 500 kPa and a volume of 0.22 m ³ to a final pressure 100 kPa in a process in which pressure and volume are related by $pv^{1.2} = \text{constant}$. (a) If the expansion is quasi-static, find Q, DU, and W for the process	5	L3	CO2	PO5



U

--

**III Semester B. Tech Mid Semester
Examination -I Department of
Mechanical Engineering**

Course Title: Engineering Materials**Course Code:** 22ME2302**Duration:** 75 Minutes**Date:** 09-11-2023**Time:** 02:30 to 03:45 PM**Max Marks:** 40**Instructions to Candidates:**

- Answer all the four Questions.
- Each question carries 10 marks.

		Marks	BT Level	CO's	PO's																		
Q. 1(a)	Distinguish between homogeneous nucleation and heterogeneous nucleation process with a neat diagram.	05	L4	CO1	PO1																		
Q. 1(b)	Make a comparison between the ductile fracture and brittle fracture in the failure of materials.	05	L3	CO2	PO1																		
Q. 2(a)	Interpret the differences between Charpy and Izod impact tests?	04	L2	CO2	PO1																		
Q. 2(b)	Explain the Hume-Rothery rules for substitutional solid solution.	06	L2	CO1	PO1																		
Q. 3(a)	Elucidate the creep behaviour with a neat diagram.	06	L3	CO2	PO2																		
Q. 3(b)	Describe the Frenkel and Schottky defects with clear diagram.	04	L1	CO1	PO2																		
Q. 4(a)	The fatigue data for a brass alloy are given as follows: <table border="1" style="margin: 10px auto;"><thead><tr><th>Stress Amplitude (MPa)</th><th>Cycles to Failure</th></tr></thead><tbody><tr><td>310</td><td>2×10^5</td></tr><tr><td>223</td><td>1×10^6</td></tr><tr><td>191</td><td>3×10^6</td></tr><tr><td>168</td><td>1×10^7</td></tr><tr><td>153</td><td>3×10^7</td></tr><tr><td>143</td><td>1×10^8</td></tr><tr><td>134</td><td>3×10^8</td></tr><tr><td>127</td><td>1×10^9</td></tr></tbody></table> <p>(a) Draw stress amplitude (S) versus logarithm cycles to failure (N) plot on graph sheet using the above data. (b) Determine the fatigue strength at 5×10^5 cycles. (c) Determine the fatigue life for 200 MPa.</p>	Stress Amplitude (MPa)	Cycles to Failure	310	2×10^5	223	1×10^6	191	3×10^6	168	1×10^7	153	3×10^7	143	1×10^8	134	3×10^8	127	1×10^9	07	L4	CO2	PO2
Stress Amplitude (MPa)	Cycles to Failure																						
310	2×10^5																						
223	1×10^6																						
191	3×10^6																						
168	1×10^7																						
153	3×10^7																						
143	1×10^8																						
134	3×10^8																						
127	1×10^9																						
Q. 4(b)	Sketch the crystal structure of FCC and calculate its atomic packing factor.	03	L3	CO1	PO2																		



SCHOOL OF ENGINEERING

USN No:

III Semester B. Tech Mid Semester

Examination – II Department of Mechanical

Engineering

Course Title: Engineering Materials
22ME2302

Course Code:

Duration: 75 Mins.

Date: 18-12-2023

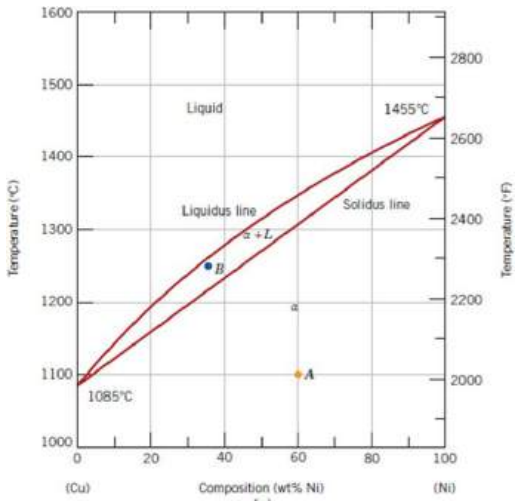
Time: 02:30 to 03:45 PM

Max Marks: 40

Instructions to Candidates:

1. Answer all the four full questions.
2. Each full question carries 10 marks.

Q No.	Question Description	Marks	BT Level	COs	POs
1)	a. Explicate binary isomorphous and binary eutectic system with phase diagram.	5	L2	CO3	PO1
	b. Draw the phase diagram and explain the solidification process of an alloy with the help of microstructures in a binary isomorphous system.	5	L3	CO3	PO1

2)	a.	<p>A 50 wt. % Ni- 50 wt. % Cu alloy is slowly cooled from 1400 °C to 1200 °C as shown in Fig. 1. At what temperature does the first solid phase form?</p>  <p style="text-align: center;">Fig. 1</p>	4	L3	CO3	PO1
	b.	Sketch the microstructures of hypo-eutectoid, eutectoid and hyper-eutectoid steels just below the eutectoid temperature as per the equilibrium phase diagram.	6	L2	CO4	PO1
3)	a.	Draw the iron-iron carbide equilibrium diagram and mark on it all the salient temperatures, composition and phases involved.	8	L4	CO4	PO2
	b.	Elucidate the application of Gibbs phase rule.	2	L2	CO4	PO2
4)	a.	Explain the classification of stainless steels. Mention the predominant alloying element in stainless steel and the typical concentration.	4	L3	CO5	PO2
	b.	Describe ceramics and give its classification.	6	L3	CO5	PO2



SCHOOL OF ENGINEERING

USN No:

III Semester B.Tech Mid Semester Examination – II

Department of Mechanical Engineering

Course Title: Machining Process and Metrology (MPM)

22ME2304 Duration: 75 Mins.

Start Time: 2:30PM - 3:45PM

Course Code:

Date: 19/12/2023

Max Marks: 40

Instructions to Candidates:

1. Answer all the four full questions.
2. Each full question carries 10 marks.

QNo.	Question Description	Marks	BT Level	COs	POs
1)	a. Describe with a neat sketch of imperial standard yard.	5	L2	CO4	PO1
	b. Discuss the following standard of measurement. 1) Line standard 2) wave length standard 3) End Standard	5	L3	CO4	PO2
2)	a. Build up a length of 35.4875 mm using the M112 set. Use two protector slips of 2.5mm each	5	L3	CO4	PO1
	b. Describe the process of wringing of slip gauges	5	L2	CO4	PO2
3)	a. Illustrate the principle of GO and NOGO Gauges with a neat sketch.	5	L1	CO5	PO4
	b. Discuss with a neat sketch the various types of fits used in the purpose assembly of machine part.	5	L2	CO5	PO4
4)	a. Four length bars of basic length 100 mm are to be calibrated using a Calibrated length bar of 400mm whose actual length is 399.9992mm. it was found that lengths of bars B,C, and D in comparison to A are + 0.0002 mm , +0.0004 mm , - 0.0001 mm respectively and the length of all the four bars put together in comparison to standard calibrated bar is +0.0003 mm longer determine the actual dimensions of all the four end bars.	10	L4	CO5	PO2

USN
No:**IVSemesterB.Tech Internal Assessment -IMechanical****Engineering****Course Title:Fluid Mechanics and Machine****Course Code: 22ME2303****Duration:75 Mins.****Date:-11-2023****Time: am to pm****Max Marks:40****Instructions to Candidates:**

- Answer all the five Questions
- Each question carries 10 marks

		Marks	BT Level	CO's	PO's
Q. 1(a)	Explain and classify as intrinsic or extrinsic i) density ii) specific volume iii) vapour pressure iv) kinematic viscosity v) capillarity	10	L1	1	1
Q. 2(a)	Find the kinematic viscosity of an oil having density 981 kg/m ³ . The shear stress at a point in oil is 0.2452 N/m ² and velocity gradient at that point is 0.2 per second.	5	L3	1	2
Q. 2(b)	Calculate specific weight. Density and specific gravity of one liter of a liquid which weighs 7N	5	L3	1	2
Q. 3(a)	Define absolute, gauge and vacuum pressure.	5	L1	2	1
Q. 3(b)	Explain the characteristics and distinctions between the following types of fluid flows. i) Steady and unsteady flow ii) Uniform and non-uniform flow	5	L2	1	1
Q. 4(a)	Calculate the pressure due to column of 0.3 m of i) water ii) oil of SG=0.8.	6	L3	1	1
Q. 4(b)	Briefly discuss any one type flow measuring device highlighting the significance of flow measurement in Industry.	4	L3	2	2

Course Outcomes Being Assessed	
CO1	Categorize the fluids based on rheological behaviour and also calculate the pressure, velocity and acceleration at a point in a static as well as fluid under motion
CO2	Apply Bernoulli's equation for a real fluid flowing between two sections for various engineering applications like measurement of discharge and estimation of losses
CO3	Develop non-dimensional groups for a physical phenomenon dependent on number of variables and also predict different flow regimes possible in case of a fluid -solid interaction based on critical Reynold's number
CO4	Calculate the power produced/ consumed and efficiencies obtained from a turbine/pump based on the velocity triangles
CO5	Compute the discharge, losses in a pipe flow and performance of hydraulic machines by conducting experiments



USN No:

IV Semester B. Tech Examinations – June 2024

Course Title: Kinematics and Dynamics of machines

Course Code: 22ME2403

Duration: 03 Hours

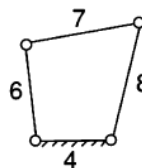
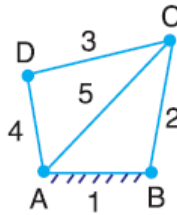
Date: 03-08-2024

Time: 09:30 AM to 12:30 PM

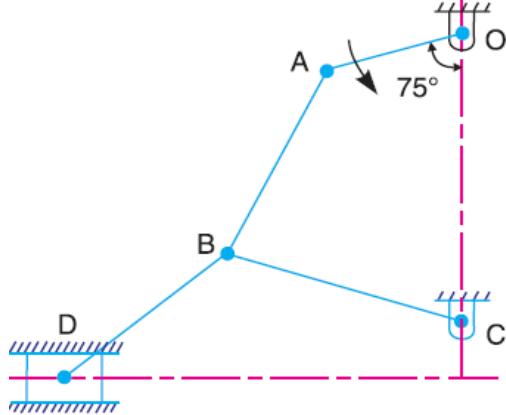
Max Marks: 100

- Note:**
1. Answer all Five Full Questions
 2. Each Full Question carries 20 Marks
 3. Draw neat sketches wherever necessary
 4. Missing Data may be suitably assumed

Q. No.	Question	Marks	BTL	COs	POs
1.a.	Define the following: i) Degree of freedom of mechanism ii) Kinematic pair iii) Kinematic chain iv) Inversion of mechanism	10	2	1	1,2
1.b.	For the kinematic linkage shown in figure determine the number of binary link N_b , ternary link N_t , other link N_o , total number of link N and degree of freedom F	5	2	1	1,2
1.c.	Determine whether the mechanism is crank-rocker, double rocker or double crank as shown in the figure	5	4	1	1,2
2.a.	Define the following: i) Configuration diagram ii) Instantaneous center	10	2	2	1
2.b.	In the figure, the angular velocity of the crank OA is 600 r.p.m. Determine the linear velocity of the slider D and the angular velocity of the link BD, when the crank is inclined	10	4	2	1,2



at an angle of 75° to the vertical. The dimensions of various links are: $OA = 28$ mm; $AB = 44$ mm; $BC = 49$ mm; and $BD = 46$ mm. The center distance between the centers of rotation O and C is 65 mm. The path of travel of the slider is 11 mm below the fixed point C . The slider moves along a horizontal path and OC is vertical.



	at an angle of 75° to the vertical. The dimensions of various links are: $OA = 28$ mm; $AB = 44$ mm; $BC = 49$ mm; and $BD = 46$ mm. The center distance between the centers of rotation O and C is 65 mm. The path of travel of the slider is 11 mm below the fixed point C . The slider moves along a horizontal path and OC is vertical.				
3.a.	Define and explain the superposition theorem as applicable to a system of forces to a mechanism	8	2	3	1
3.b.	A horizontal gas engine running at 210 rpm and a stroke of 440 mm. The connecting rod is 924 mm long and the reciprocating parts weigh 20 kg. When the crank has turned through an angle of 30° from the inner dead center, the gas pressure on the cover and the crank sides are 500 kN/m ² and 60 kN/m ² respectively. Diameter of the piston is 40 mm. Determine i) turning moment on the crankshaft ii) thrust on the bearing	12	4	3	1,2
4.a.	Explain the following with a neat sketch i) Static balancing ii) Dynamic balancing	10	2	4	1,2
4.b.	A shaft carries four masses A, B, C and D of magnitude 200 kg, 300 kg, 400 kg and 200 kg respectively and revolving at radii 80 mm, 70 mm, 60 mm and 80 mm in planes measured from A at 300 mm, 400 mm and 700 mm. The angles between the cranks measured anticlockwise are A to B 45° , B to C 70° and C to D 120° . The balancing masses are to be placed in planes X and Y. The distance between the planes A and X is 100 mm, between X and Y is 400 mm and between Y and D is 200 mm. If the balancing masses revolve at a radius of 100 mm, find their magnitudes and angular positions.	10	4	4	1,2

5.a.	Explain the working principle of centrifugal governor with neat sketch		10	2	5	1
5.b.	A Porter governor has equal arms each 250 mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor.		10	4	5	1,2

* Blooms Taxonomy Levels (BTL) - L1, L2, L3, L4, L5, L6

* Course Outcomes (COs) - CO1, CO2, CO3,

* Program Outcomes (POs) - PO1, PO2, PO3,



USN No:

IV Semester B. Tech Examinations – June 2024

Course Title: Kinematics and Dynamics of machines

Course Code: 22ME2403

Duration: 03 Hours

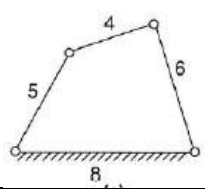
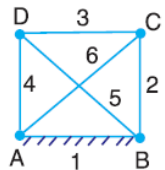
Date: 03-08-2024

Time: 09:30 AM to 12:30 PM

Max Marks: 100

- Note:**
1. Answer all Five Full Questions
 2. Each Full Question carries 20 Marks
 3. Draw neat sketches wherever necessary
 4. Missing Data may be suitably assumed

Q. No.	Question	Marks	BTL	COs	POs
1.a.	Define the followings: v) Lower pair vi) Higher pair vii) Turning pair viii) Rolling Pair	10	2	1	1,2
1.b.	For the kinematic linkage shown in figure determine the number of binary link N_b , ternary link N_t , other link N_o , total number of link N and degree of freedom F	5	2	1	1,2
1.c.	Determine whether the mechanism is crank-rocker, double rocker or double crank as shown in the figure	5	4	1	1,2
2.a.	Define the following: iii) Velocity of rubbing iv) Kennedy's theorem	10	2	2	1
2.b.	In a four-bar chain ABCD, AD is fixed and is 150 mm long. The crank AB is 40 mm long and rotates at 120 r.p.m. clockwise, while the link CD = 80 mm oscillates about D.	10	4	2	1,2



	<p>BC and AD are of equal length. Determine the angular velocity of link CD when angle BAD = 60°.</p>				
3.a.	<p>Explain the condition of bodies under the equilibrium with a neat sketch under the action of i) two forces and torque ii) three forces</p>	10	2	3	1
3.b.	<p>The crank and the connecting rod of a vertical petrol engine, running at 1800 rpm are 60 mm and 270 mm respectively. The diameter of the piston is 100 mm and the mass of the reciprocating parts is 1.2 kg. During the expansion stroke, when the crank has turned 20° from the top dead center, the gas pressure is 650 kN/m². Determine i) net force on the piston ii) net load on the pin iii) thrust on the cylinder wall</p>	10	4	3	1,2
4.a.	<p>Explain the following with a neat sketch</p> <p>iii) Static balancing</p> <p>iv) Dynamic balancing</p>	10	2	4	1,2
4.b.	<p>Four masses m_1, m_2, m_3 and m_4 are 200 kg, 300 kg, 240 kg and 260 kg respectively. The corresponding radii of rotation are 0.2 m, 0.15 m, 0.25 m and 0.3 m respectively and the angles between successive masses are 45°, 75° and 135°. Find the position and magnitude of the balance mass required, if its radius of rotation is 0.2 m.</p>	10	4	4	1,2
5.a.	<p>Explain the following:</p> <p>i) Base circle of Cam</p> <p>ii) Pitch curve</p> <p>iii) Pressure angle</p> <p>iv) Trace point</p>	10	2	5	1
5.b.	<p>The arms of a Porter governor are each 250 mm long and pivoted on the governor axis. The mass of each ball is 5 kg and the mass of the central sleeve is 30 kg. The radius of rotation of the balls is 150 mm when the sleeve begins to rise and reaches a value of 200 mm for maximum speed.</p>	10	4	5	1,2

	Determine the speed range of the governor. If the friction at the sleeve is equivalent of 20 N of load at the sleeve, determine how the speed range is modified.					
--	--	--	--	--	--	--

*** Blooms Taxonomy Levels (BTL) - L1, L2, L3, L4, L5, L6**

*** Course Outcomes (COs) - C01, C02, C03,**

*** Program Outcomes (POs) - P01, P02, P03,**



SCHOOL OF ENGINEERING

USN No:

IV Semester B. Tech Mid Semester Examination – II Department of Mechanical Engineering

Course Title: Mechanics of Solid

Course Code: 22ME2404

Duration: 75 Mins.

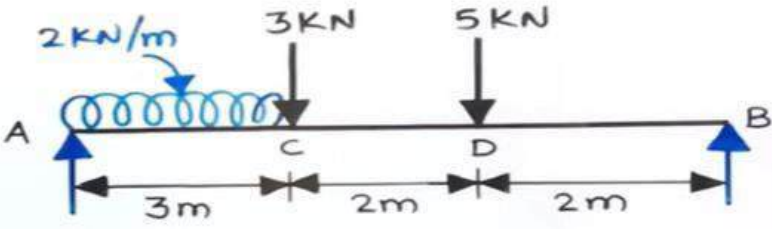
Date: 16-05-2024

Start Time: 2.30 pm

Max Marks: 40

Instructions to Candidates:

1. Answer all four questions.
2. Each full question carries 10 marks.

Q No.	Question Description	Marks	BT Level	COs	POs
1) a.	Analyse shear force and bending moment for any engineering beam with an example.	7	L4	CO3	PO1,2
b.	Demonstrate the point of contraflexure.	3	L3	CO3	PO1,2
2) a.	Construct SFD and BMD for a simply supported beam with applied point loads and a UDL as shown below: 	10	L5	CO3	PO1,2,3
3) a.	Illustrate Euler beam theory and derive the relation between E, I, M, y, σ and R.	5	L3	CO4	PO1,2
b.	Illustrate buckling with a neat diagram.	5	L3	CO4	PO1,2
4) a.	Evaluate the critical load for a fixed-pinned column. Length of the column is 1 m and it is made up of steel ($E=200$ GPa). Take $\pi=3.14$. (Cross-section is a square section with side 10 mm)	10	L5	CO4	PO1,2,3





SCHOOL OF ENGINEERING

USN No:

IV Semester B. Tech Mid Semester Examination - I

Department of Mechanical Engineering

Course Title: Mechanics of Solid

Course Code: 22ME2404

Duration: 75 Mins.

Date: 04-04-2024

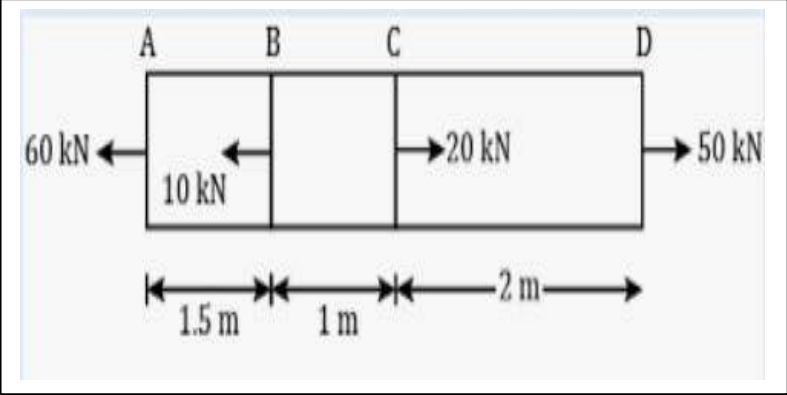
Start Time: 2.30 pm

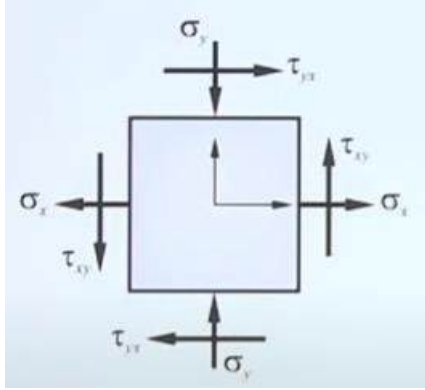
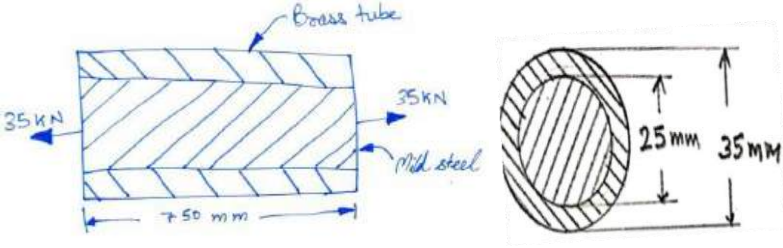
Max Marks: 40

Instructions to Candidates:

1. Answer all the five full questions.
2. Each full question carries 10 marks.

Q No.	Question Description	Marks	BT Level	COs	POs
1)	a. Draw stress-strain diagram for mild steel and analyse the specific points on it.	5	L4	CO1	PO1,2
	b. Define: (i) Poisson's Ratio (ii) Bulk Modulus (iii) Shear Modulus	3	L1	CO1	PO1,2
	c. Illustrate the elongation in uniformly tapered bar of circular cross section.	2	L2	CO1	PO1,2

2)	a.	<p>Evaluate the elongation in the bar as shown in below figure. Take cross-sectional areas as 1 m^2. Consider Young's modulus as $2 \times 10^{11} \text{ N/m}^2$.</p> 	6	L5	CO1	PO1,2,3
----	----	---	---	----	-----	---------

	b.	A steel rail, rigidly fixed at its ends is assumed to be stress-free at -20°C . If the stress required to cause the buckling of the rail is -75 MPa , at what temperature will the rail buckle? ($E=2 \times 10^{11}\text{ N/m}^2$, $\alpha= 12.5 \times 10^{-6}/^{\circ}\text{C}$).	4	L3	CO1	PO1,2,3
3)	a.	Derive hoop and longitudinal stresses in thin cylinders.	5	L2	CO2	PO1,2
	b.	Analyse the Mohr's circle for pure shear case on a 2D plane.	5	L4	CO2	PO1,2
4)	a.	The state of stresses on an element is shown in the given figure. The values of stresses are $\sigma_{xx} = 32\text{ MPa}$, $\sigma_{yy} = -10\text{ MPa}$ and major principal stress $\sigma_1 = 40\text{ MPa}$. Compute the minor principal stress σ_2 .	6	L3	CO2	PO1,2,3
						
	b.	Analyse the stresses, load carried by each member and the elongation of the composite bar as shown below. Take $E_B=95\text{ GPa}$ and $E_s=210\text{ GPa}$.	4	L4	CO2	PO1,2,3
		 <p style="text-align: center;">(Side view)</p>				



USN No:

IV Semester B. Tech Examinations – JUNE 2024

Course Title: Mechanics of Solid

Course Code: 22ME2404

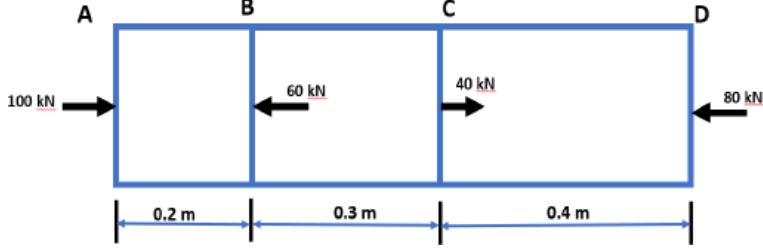
Duration: 03 Hours

Date: XX-XX-XXXX

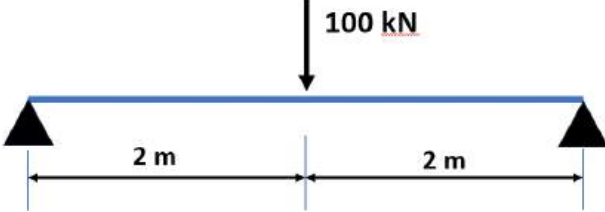
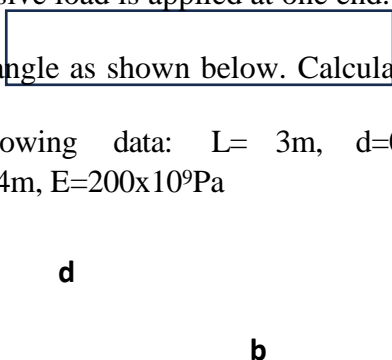
Time:XXXXXXXXXXXXXXXXXX

Max Marks: 100

- Note:**
1. Answer all Five Full Questions
 2. Each Full Question carries 20 Marks
 3. Draw neat sketches wherever necessary
 4. Missing Data may be suitably assumed

Q. No.	Question	Marks	BTL	COs	POs
1.a.	<p>Find the elongation of the following bar element of circular cross-section of diameter 0.2 m and subjected to axial loading as shown below: (Take $E=200 \times 10^9 \text{ N/m}^2$)</p> 	(12 Marks)	L4	C01	1,2,3
1.b.	Explain isotropic and homogeneous materials	(05 Marks)	L2	C01	1,2,3
1.c.	Interpret Poisson's ratio.	(03 Marks)	L3	C01	1,2,3
2.a.	Illustrate Mohr's circle with example.	(04 Marks)	L4	C02	1,2,3
2.b.	Draw and analyze the Mohr circle when a cube-shaped box is submerged into liquid facing constant pressure of 100 MPa.	(08 Marks)	L4	C02	1,2,3
2.c.	Derive hoop stress for thin cylinder.	(08 Marks)	L6	C02	1,2,3

3.a.	Draw SFD and BMD diagram for the following loading conditions on simply supported beam:		(14 Marks)	L5	C03	1,2, 3

					
3.b.	Derive Euler's Bending theory with neat sketch.	(06 Marks)	L6	C03	1,2,3
4.a.	A column is pinned at both the ends while axial, compressive load is applied at one end. The cross-section is a rectangle as shown below. Calculate the critical load for following data: $L= 3\text{m}$, $d=0.02\text{m}$, $b=0.04\text{m}$, $E=200 \times 10^9\text{Pa}$	(12 Marks)	L3	C04	1,2,3
					
4.b.	Compare shafts in series and shafts in parallel.	(08 Marks)	L4	C04	1,2,3
5.a.	Analyze maximum principal stress theory for failures in materials. State limitations.	(08 Marks)	L4	C05	1,2,3
5.b.	Illustrate strain energy in a bar made of isotropic and homogeneous material stretched upto proportionality limit.	(06 Marks)	L3	C05	1,2,3
5.c.	Illustrate Castigliano theorem to find deflections and rotations for a beam.	(06 Marks)	L3	C05	1,2,3

* Blooms Taxonomy Levels (BTL) – L1, L2, L3, L4, L5, L6

* Course Outcomes (COs) – CO1, CO2, CO3,

* Program Outcomes (POs) – PO1, PO2, PO3,



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES

PROGRAM: B.Sc. NURSING

PROGRAMME EDUCATIONAL OBJECTIVES (PEO's)

- PEO1** Produce knowledgeable competent nurses and midwives with clear critical thinking skills who are caring, motivated, assertive and well-disciplined responding to the changing needs of profession, healthcare delivery system and society.
- PEO2** Prepare them to assume responsibilities as professional, competent nurses and midwives in providing promotive, preventive, curative and rehabilitative healthcare services in any healthcare setting.
- PEO3** Prepare nurses and midwives who can make independent decisions in nursing situations within the scope of practice, protect the rights of individuals and groups and conduct research in the areas of nursing practice and apply evidence based practice.
- PEO4** Prepare them to assume role of practitioner, teacher, supervisor and manager in all healthcare settings.

[Handwritten Signature]
PRINCIPAL
College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY
Harohalli, Karnataka-562112



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES

PROGRAM: B.Sc. NURSING

PROGRAMME SPECIFIC OBJECTIVES (PSO's)

- PSO1 Utilize critical thinking to synthesize knowledge derived from physical, biological, behavioural sciences, and humanities, in the practice of professional nursing and midwifery.
- PSO2 Practice professional nursing and midwifery competently and safely in diverse settings, utilizing caring, critical thinking and therapeutic nursing interventions with individuals, families, populations and communities at any developmental stage and with varied lived health experiences.
- PSO3 Provide promotive, preventive and restorative health services in line with national health policies and programs.
- PSO4 Integrate professional caring into practice decisions that encompass values, ethical, and moral and legal aspects of nursing.
- PSO5 Respect the dignity, worth, and uniqueness of self and others.
- PSO6 Apply concepts of leadership, autonomy and management to the practice of nursing and midwifery to enhance quality and safety in health care.
- PSO7 Utilize the latest knowledge and skills related to information and technology to enhance patient outcomes.
- PSO8 Communicate effectively with patients, peers, and all health care providers.
- PSO9 Utilize the requisite knowledge, skills and technologies to practice independently and collaboratively with all health professionals applying the principles of safety and quality improvement.
- PSO10 Integrate research findings and nursing theory in decision making in evidence-based practice.
- PSO11 Accept responsibility and accountability for the effectiveness of one's own nursing and midwifery practice and professional growth as a learner, clinician and leader.
- PSO12 Participate in the advancement of the profession to improve health care for the betterment of the global society.



**DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES**

PROGRAM: B.Sc. NURSING

PROGRAM OUTCOMES

PO1 Patient centered care: Provide holistic care recognizing individual patient's preferences, values and needs, that is compassionate, coordinated, age and culturally appropriate safe and effective care.

PO2 Professionalism: Demonstrate accountability for the delivery of standard-based nursing care as per the Council standards that is consistent with moral, altruistic, legal, ethical, regulatory and humanistic principles.

PO3 Teaching & Leadership: Influence the behavior of individuals and groups within their environment and facilitate establishment of shared goals through teaching and leadership

PO4 System-based practice: Demonstrate awareness and responsiveness to the context of healthcare system and ability to manage resources essential to provide optimal quality of care.

PO5 Health informatics and Technology: Use technology and synthesize information and collaborate to make critical decisions that optimize patient outcomes.

PO6 Communication: Interact effectively with patients, families and colleagues fostering mutual respect and shared decision making to enhance patient satisfaction and health outcomes.

PO7 Teamwork and Collaboration: Function effectively within nursing and interdisciplinary teams, fostering open communication, mutual respect, shared decision making, team learning and development.

PO8 Safety: Minimize risk of harm to patients and providers through both system effectiveness and individual performance.

PO9 Quality improvement: Use data to monitor the outcomes of care processes and utilize improvement methods to design and test changes to continuously improve the quality and safety of healthcare system.

PO10 Evidence based practice: Identify, evaluate and use the best current evidence coupled with clinical expertise and consideration of patient's preferences, experience and values to make practical decisions

Abhishek
PRINCIPAL
College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY
Harohalli, Karnataka-562112



**DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES**

PROGRAM: PB B.Sc. NURSING

PROGRAMME EDUCATIONAL OBJECTIVES (PEO's)

- PEO1** Produce knowledgeable competent nurses and midwives with clear critical thinking skills who are caring, motivated, assertive and well-disciplined responding to the changing needs of profession, healthcare delivery system and society.
- PEO2** Prepare them to assume responsibilities as professional, competent nurses and midwives in providing promotive, preventive, curative and rehabilitative healthcare services in any healthcare setting.
- PEO3** Prepare nurses and midwives who can make independent decisions in nursing situations within the scope of practice, protect the rights of individuals and groups and conduct research in the areas of nursing practice and apply evidencebased practice.
- PEO4** Prepare them to assume role of practitioner, teacher, supervisor and manager in all healthcare settings.

Abhishek
PRINCIPAL
College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY
Harohalli, Karnataka-562112



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES

PROGRAM: PBB.Sc. NURSING

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1 Assess health status, identify nursing needs, plan, implement and evaluate nursing care for patients / clients that contribute to health of individuals, families and communities.

PSO2 Demonstrate competency in techniques of nursing based on concepts and principles from selected areas of nursing, physical, biological and behavioral sciences.

PSO3 Participate as members of health team in the promotive, preventive, curative and restorative health care delivery system of the country.

PSO4 Demonstrate skills in communication and interpersonal relationship.

PSO5 Demonstrate leadership qualities and decision-making abilities in various situations.

PSO6 Demonstrate skills in teaching to individuals and groups in community health settings.

PSO7 Demonstrate managerial skills in community health settings.

PSO8 Practice ethical values in their personal and professional life.

PSO9 Participate in research activities and utilize research findings in improving nursing practice.

PSO10 Recognise the need for continued learning for their personal and professional development.

Shreedevi
PRINCIPAL
College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY
Harohalli, Karnataka-562112



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES

PROGRAM: PB B.Sc. NURSING

PROGRAM OUTCOMES

PO1 Patient centered care: Provide holistic care recognizing individual patient's preferences, values and needs, that is compassionate, coordinated, age and culturally appropriate safe and effective care.

PO2 Professionalism: Demonstrate accountability for the delivery of standard-based nursing care as per the Council standards that is consistent with moral, altruistic, legal, ethical, regulatory and humanistic principles.

PO3 Teaching & Leadership: Influence the behavior of individuals and groups within their environment and facilitate establishment of shared goals through teaching and leadership

PO4 System-based practice: Demonstrate awareness and responsiveness to the context of healthcare system and ability to manage resources essential to provide optimal quality of care.

PO5 Health informatics and Technology: Use technology and synthesize information and collaborate to make critical decisions that optimize patient outcomes.

PO6 Communication: Interact effectively with patients, families and colleagues fostering mutual respect and shared decision making to enhance patient satisfaction and health outcomes.

PO7 Teamwork and Collaboration: Function effectively within nursing and interdisciplinary teams, fostering open communication, mutual respect, shared decision making, team learning and development.

PO8 Safety: Minimize risk of harm to patients and providers through both system effectiveness and individual performance.

PO9 Quality improvement: Use data to monitor the outcomes of care processes and utilize improvement methods to design and test changes to continuously improve the quality and safety of healthcare system.

PO10 Evidence based practice: Identify, evaluate and use the best current evidence coupled with clinical expertise and consideration of patient's preferences, experience and values to make practical decisions

Abhishek

PRINCIPAL,
College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY



**DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES**

PROGRAM: M.Sc. NURSING

PROGRAMME EDUCATIONAL OBJECTIVES (PEO's)

PEO1 Apply Evidence based practice in nursing in advanced competent, comprehensive care to individuals, families and community.

PEO2 Practice as a nurse specialist maintaining interprofessional relationship with members of the health care team to bring about change in nursing practice and health care delivery.

PEO3 Demonstrate leadership, management, collaborative communication, teaching, and research skills in providing competent care across various health care settings.

PEO4 Engage in continuous personal and professional development through research and education in nursing.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1 Utilize/apply the concepts, theories and principles of nursing science

PSO2 Demonstrate advance competence in practice of nursing.

PSO3 Practice as a nurse specialist.

PSO4 Demonstrate leadership qualities and function effectively as nurse educator and manager.

PSO5 Demonstrate skill in conducting nursing research, interpreting and utilizing the findings from health-related research.

PSO6 Demonstrate the ability to plan and effect change in nursing practice and in the health care delivery system.

PSO7 Establish collaborative relationship with members of other disciplines.

PSO8 Demonstrate interest in continued learning for personal and professional advancement.

Abhishek
PRINCIPAL
College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES

PROGRAM: M.Sc. NURSING

PROGRAM OUTCOMES

- PO1** Explore research as evidence for enhancing and changing practice
- PO2** Discuss the health strategies in promoting, maintaining and restoring health and well-being
- PO3** Demonstrate proficiency in written, verbal and digital skills at individual and collaborative levels
- PO4** Apply critical thinking skills and ethical decision making required for advancing practice
- PO5** Demonstrate the ability to undertake independent learning activities
- PO6** Value the contribution of research in advancing practice in the provision of quality care
- PO7** Evaluate leadership and management skills for working in collaborative teams in the provision of quality outcome
- PO8** Recognize the need for the advancement of professional practice through contributions to education administration, health care policy and knowledge development

Abhisek

B.Sc. NURSING

COURSE LEARNING OUTCOMES (COs)

COURSE DETAILS	COURSE LEARNING OUTCOMES (COs)
<p>Course Name: Communicative English Course Code: ENGL 101 Semester: 1 Credit Hours: 2</p>	<p>CO1: Speak and write grammatically correct English CO2: Develop skill in spoken English</p>
<p>Course Name: Applied Anatomy Course Code: ANAT 105 Semester: 1 Credit Hours: 3</p>	<p>CO1: Describe the basic anatomy of the human body. CO2: Identify the anatomical structures of the human body CO3: Apply knowledge of anatomic structures to analyze clinical situations and therapeutic applications CO4: Discuss the relationships between different body systems in maintaining homeostasis.</p>
<p>Course Name: Applied Physiology Course Code: PHYS 110 Semester: 1 Credit Hours: 3</p>	<p>CO1: Describe the basic physiology of the human body. CO2: Describe the effect of alterations in functions CO3: Apply knowledge of physiological basis to analyze clinical situations and therapeutic applications CO3: Discuss the relationships between different body systems in maintaining homeostasis.</p>
<p>Course Name: Applied Psychology Course Code: SOCI 115 Semester: 1 Credit Hours: 3</p>	<p>CO1: Explain the psychological factors influencing personality development of individuals. CO2: Demonstrate self confidence in social communication in clinical settings. CO3: Perform the role of nurses applicable to the psychology of different age groups and according to the cognitive and affective needs of clients.</p>
<p>Course Name: Applied Sociology Course Code: PSYC 120 Semester: 1 Credit Hours: 3</p>	<p>CO1: Explain the sociological factors influencing of culture and disease. CO2: Describe the inter-relationship of individual in society and community</p>

Principals
PRINCIPAL

		<p>C03: Practice effective communication and teamwork skills for delivering nursing care in the clinical settings and community.</p> <p>C01: Explain the impact of past nursing practice to contemporary nursing practice.</p> <p>C02: Perform basic nursing procedures in simulated clinical settings.</p> <p>C03: Demonstrate values, attitude and professionalism in performing basic nursing procedures.</p>
<p>Course Name: Nursing Foundation I</p> <p>Course Code: N-NF (I) 125</p> <p>Semester: 1</p> <p>Credit Hours: 6</p>		<p>C01: Perform basic nursing procedures in the clinical settings.</p> <p>C02: Demonstrate self-confidence, respect and social communication while performing basic nursing procedures.</p> <p>C03: Demonstrate effective communication and teamwork skills while performing basic nursing procedures.</p>
<p>Course Name: Nursing Foundation I (Practical)</p> <p>Course Code: N-NF (I) 125</p> <p>Semester: 1</p> <p>Credit Hours: 4</p>		<p>C01: Explain the impact of nutrition in promoting health and wellness.</p> <p>C02: Explain the basic metabolism of nutrients.</p> <p>C03: Discuss the balanced diet and importance of nutrition towards enhancing health and wellness.</p>
<p>Course Name: Applied Nutrition & Dietetics</p> <p>Course Code: NUTR 140</p> <p>Semester: 2</p> <p>Credit Hours: 32</p>		<p>C01: Describe the basic biochemistry of the human body.</p> <p>C02: Apply knowledge of biochemical process to analyze clinical situations and therapeutic applications</p> <p>C03: Discuss the relationships between metabolism in maintaining homeostasis.</p>
<p>Course Name: Applied Biochemistry</p> <p>Course Code: BIOC 135</p> <p>Semester: 2</p> <p>Credit Hours: 2</p>		<p>C01: Demonstrate skills in word processing, internet usage, PowerPoint presentations.</p> <p>C02: Describe the principles of health and nursing informatics and its use in developing efficient healthcare.</p> <p>C03: Apply evidence-based practices in informatics and technology for providing quality patient care.</p>
<p>Course Name: Health/Nursing Informatics & Technology</p> <p>Course Code: HNIT 145</p> <p>Semester: 2</p> <p>Credit Hours: 2</p>		<p>C01: Use the nursing process in providing excellent care for diverse clients.</p>

<p>Course Code: N-NF (I) 125 Semester: 2 Credit Hours: 6</p>	<p>C02: Perform respiratory, nutritional, elimination, fluid and electrolyte therapy and 'last office' nursing procedures to diverse clients. C03: Demonstrate values, attitude and professionalism in performing nursing procedures to diverse clients. C04: Perform first aid measures during emergencies.</p>
<p>Course Name: Nursing Practice 2 Course Code: N-NF (I) 125 Semester: 2 Credit Hours: 7</p>	<p>C01: Apply theoretical knowledge as gained in the theory session. C02: Demonstrate caring attitude and good communication skills with patients and staff. C03: Demonstrate practical skills in all designated procedures as indicated in the log book for Semester 2.</p>
<p>Course Name: Applied Microbiology and Infection Control Including Safety Course Code: MICR 201 Semester: 3 Credit Hours: 1</p>	<p>C01: Describe the major classification of microorganism and parasites. C02: Explain the impact of microbes and parasite in the healthcare practice. C03: Explain chain of infection and infection control within healthcare setting.</p>
<p>Course Name: Adult Health Nursing I with Integrated Pathophysiology Course Code: N-AHN (I) 215 Semester: 3 Credit Hours: 7</p>	<p>C01: Apply medical and surgical nursing knowledge in delivering holistic care to adult clients with various medical and surgical conditions. C02: Integrate ethic and professionalism in caring for clients with various medical and surgical conditions in clinical settings. C03: Design appropriate nursing care plans for clients with various medical and surgical conditions in clinical settings. C04: Perform Basic nursing procedures and basic CPR.</p>
<p>Course Name: Pharmacology I & II Course Code: PHAR (I) 205 & PHAR (II) 205 Semester: 3 & 4 Credit Hours: 4</p>	<p>C01: Explain the pharmacological terms, discuss the various systems of classification and naming of drugs, and develop an understanding of how drugs are regulated. C02: Critically explain principles of safe administration of drugs; and develop an appreciation for the occupational health issues in handling of medications.</p>

B. Suresh
PRINCIPAL

College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY
Harohalli, Karnataka-562112

<p>Course Name: Pathology I & II including Genetics Course Code: PATH (I) 210 & PATH (II) 210 Semester: 3 & 4 Credit Hours: 2</p>	<p>CO3: Demonstrate the administration of drugs and the nursing implications across the lifespan. CO1: Apply the knowledge of pathology in understanding the deviations from normal to abnormal pathology. CO2: Apply the knowledge of genetics in understanding the various pathological disorders. CO3: Demonstrate the understanding of the methods of collection of blood, body cavity fluids, urine and feces for various tests.</p>
<p>Course Name: Adult Health Nursing I (Practical) Course Code: N-AHN (I) 215 (P) Semester: 3 Credit Hours: 7</p>	<p>CO1: Perform nursing procedures related to caring for patients with various medical and surgical conditions in the clinical settings. CO2: Demonstrate self-confidence, respect and social communication while caring for patients with medical and surgical conditions in the clinical settings. CO3: Demonstrate effective communication and teamwork skills while caring for patients with various medical and surgical conditions in the clinical settings.</p>
<p>Course Name: Adult Health Nursing 2 with Integrated Pathophysiology including Geriatric Nursing and Palliative care Module Course Code: N-AHN (II) 225 Semester: 4 Credit Hours: 73</p>	<p>CO1: Apply medical and surgical nursing knowledge in delivering holistic care to adult and geriatric clients with various medical and surgical conditions. CO2: Integrate ethic and professionalism in caring for adult and geriatric clients with various medical and surgical conditions in clinical settings. CO3: Design appropriate nursing care plans for adult and geriatric clients with various medical and surgical conditions in clinical settings. CO4: Perform Basic palliative nursing care and procedures.</p>
<p>Course Name: Adult Health Nursing II (Practical) Course Code: N-AHN (II) 225 (P) Semester: 4 Credit Hours: 7</p>	<p>CO1: Perform nursing procedures related to caring for adult and geriatric clients with various medical and surgical conditions in the clinical settings. (PLO2 – P4) CO2: Demonstrate self-confidence, respect and social communication while caring for adult and geriatric clients with various medical and surgical conditions in the clinical settings. (PLO3 – A3) CO3: Design appropriate nursing care plans for adult and geriatric clients with various medical and surgical</p>

	conditions in clinical settings. (PLO6 – C5) C04: Practice managerial skills for delivering nursing care in the clinical settings.
Course Name: Professionalism, Professional Values & Ethics Including Bioethics Course Code: NBN4734 Semester: 4 Credit Hour: 1	C01: Critically discuss professionalism, professional values & ethics in nursing. C02: Describe the medico-legal aspects in nursing. C03: Integrate professionalism, professional values & ethics including bioethics in managing work flow and medico-legal aspects of the organization.
Course Name: Educational Technology in Nursing Education Course Code: EDUC 315 Semester: 5 Credit Hours: 2	C01: Explain principle of teaching and learning in nursing. C02: Describe guidance and mentoring of students. C03: Critically discuss evidence-based teaching practices and applicable to nursing education.
Course Name: Child Health Nursing I & II Course Code: N-CHN(I) 301 & N-CHN(II) 301 Semester: 5 & 6 Credit Hours: 5	C01: Explain the growth and development of children and the assessment. C02: Explain the common pediatric conditions. C03: Describe the assessment, planning, implementing and evaluating nursing care provided to sick children.
Course Name: Child Health Nursing (Practical) Course Code: N-CHN(I) 301 & N-CHN(II) 301 (P) Semester: 5 & 6 Credit Hours: 4	C01: Carry out assessment for growth and development of children through pediatric nursing care in the clinical settings. C02: Perform effective procedures and evaluation of nursing care for pediatric patients in the clinical settings. C03: Design appropriate nursing care plans for patients with pediatric conditions in the clinical and community settings.
Course Name: Mental Health Nursing I & II Course Code: N-MHN(I) 305 & N-MHN(II) 305 Semester: 5 & 6	C01: Identify and discuss the general signs, symptoms, treatments, nursing care and rehabilitation of patients with mental illness and do so across the lifespan. C02: Critically discuss mental health problems occurring in patients with physical illness in hospital and community settings.

Credit Hours: 5	other health care settings. CO3: Identify the specific needs, treatment and care for patients with mental illness.
Course Name: Mental Health Nursing (Practical) Course Code: N-MHN(I) 305 & N-MHN(II) 305 (P) Semester: 6 Credit Hours: 3	CO1: Evaluate issues related to mental health and geriatric care to provide quality care in clinical and community settings. CO2: Integrate social skills and responsibilities related to mental health and geriatric care to provide quality care in clinical and community settings. CO3: Demonstrate effective communication skills related to mental health and geriatric care to provide quality care in clinical and community settings.
Course Name: Introduction to Forensic Nursing and Indian Laws Course Code: N-FORN 320 Semester: 6 Credit Hour: 1	CO1: Explain principle and scope of forensic nursing. CO2: Critically Indian judicial system and legal procedures.
Course Name: Nursing Management and Leadership Course Code: NMLE 330 Semester: 6 & 7 Credit Hours: 10	CO1: Explain principle of management and leadership in nursing. CO2: Display leadership skills and team work in the efficient management of work flow of the Organization. CO3: Critically discuss ethical and legal issues related to nursing education and practice.
Course Name: Community Health Nursing I & II Course Code: N-CHN(I) 301 & N-CHN(II) 401 Semester: 5 & 7 Credit Hours: 3	CO1: Explain the expansion and principles of health services and practices in primary health care to the community. CO2: Explain the activities in the health clinic; during home and school visit. CO3: Demonstrate correct nursing procedures related to community nursing.
Course Name: Community Health Nursing (Practical)	CO1: Perform nursing procedures related to caring for people in the community settings. CO2: Demonstrate self-confidence, respect and social communication while caring for people in the

Abhishek

<p>Course Code: N-CHN(I) 301 & N-CHN(II) 401 (P) Semester: 5 & 7 Credit Hours: 4</p> <p>Course Name: Obstetrics and Gynecology Nursing</p> <p>Course Code: N-MIDW(I) / OBGN 335 & N-MIDW(II) / OBGN 335 Semester: 6 & 7 Credit Hours: 6</p>	<p>community settings.</p> <p>CO3: Design appropriate nursing care plans for client and family in the clinical and community settings.</p> <p>CO4: Practice managerial skills for delivering nursing care in the community settings.</p> <p>CO1: Apply knowledge of physiological changes and management of women in ante, intra, post-partum and gynecological conditions in the clinical settings.</p> <p>CO2: Describe nursing care for patient with obstetrics and gynecology conditions.</p> <p>CO3: Plan suitable nursing care by using problem solving and scientific skills for clients with obstetrics and gynecology conditions in the clinical settings.</p>
<p>Course Name: Obstetrics and Gynecology Nursing (Practical)</p> <p>Course Code: N-MIDW(I) / OBGN 335 & N-MIDW(II) / OBGN 335 (P) Semester: 5 Credit Hours: 9</p>	<p>CO1: Perform nursing procedures related to caring for patients with O&G conditions in the clinical and community settings.</p> <p>CO2: Demonstrate self-confidence, respect and social communication while caring for patients with O&G in the clinical and community settings.</p> <p>CO3: Design appropriate nursing care plans for patients with O&G conditions in the clinical and community settings.</p> <p>CO4: Practice managerial skills for delivering nursing care in the clinical and community settings.</p>
<p>Course Name: Nursing Research and Statistics</p> <p>Course Code: NRST 405 Semester: 6 Credit Hours: 2</p>	<p>CO1: Describe research and research process.</p> <p>CO2: Explain descriptive and inferential statistics.</p> <p>CO3: Integrate moral values, ethics and professionalism in preparing a research proposal.</p>
<p>Course Name: Research Project</p> <p>Course Code: NRST 405 (P) Semester: 7 Credit Hours: 2</p>	<p>CO1: Demonstrate effective academic writing and presentation in delivering the findings of research projects.</p> <p>CO2: Generate scientific reports based on the findings of research projects.</p> <p>CO3: Demonstrate autonomous learning and inquisitive minds in producing academic writings and</p>

Principals
PRINCIPAL

<p>Course Name: Internship Course Code: NBN4817</p> <p>Semester: 8 Credit Hours: 12</p>	<p>presentations for delivering findings of research projects.</p> <p>CO1: Integrate effective communication skills, leadership and team work in delivering nursing care for adult patients in the clinical and community settings.</p> <p>CO2: Relate contemporary issues in the care of adult patients to enhance health care in the clinical and community settings.</p> <p>CO3: Demonstrate autonomous learning and inquisitive mind in self-apprising of issues in the care of adult patients in the clinical and community settings.</p> <p>CO4: Display managerial skills in delivering health care for adult patients in the clinical and community settings.</p>
--	---

Abhishek

PRINCIPAL
College of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY
Harohalli, Karnataka-562142

PB B.Sc. NURSING

COURSE OUTCOMES (COs)

COURSE DETAILS	COURSE OUTCOMES (COs)
<p>Course Name: Biochemistry Course Code: 16PB101 Year: 1</p>	<p>CO1: Describe the basic biochemistry, water and electrolyte balance. CO2: Explain the metabolism of enzymes, carbohydrates, proteins and fat. CO3: Discuss the importance of hospital biomedical waste management.</p>
<p>Course Name: Biophysics Course Code: 16PB102 Year: 1</p>	<p>CO1: Identify the basic principles and concepts of biophysics and its applications to imaging techniques. CO2: Apply the biophysics principles in various Nursing situations.</p>
<p>Course Name: Nutrition and Dietetics Course Code: 16PB103 Year: 1</p>	<p>CO1: Explain the impact of metabolism of nutrients and balanced diet in promoting health and wellness. CO2: Discuss nutritional needs of different age groups and various nutritional programmes. CO3: Discuss Different cookery rules and role of nurse in assessment of nutritional status and nutritional education.</p>
<p>Course Name: Microbiology Course Code: 16PB104 Year: 1</p>	<p>CO1: Describe the major classification disease causing microorganisms and parasites. CO2: Explain the impact of microbes and parasite in the healthcare practice. CO3: Explain the infection control, and sterilization and disinfection in healthcare setting.</p>
<p>Course Name: Psychology Course Code: 16PB105 Year: 1</p>	<p>CO1: Explain the psychological factors influencing personality development and behaviour of individuals. CO2: Demonstrate psychometric assessment and psychological aspects in patient care. CO3: Perform the role of nurses apply psychology of different age groups and according to the cognitive and affective needs of clients.</p>
<p>Course Name: Nursing Foundation Course Code: 16PB106 Year: 1</p>	<p>CO1: Explain the professional aspects, theories and ethics in nursing. CO2: Apply nursing process in various levels of health services. CO3: Discuss the current trends and quality assurance in nursing.</p>

<p>Course Name: Maternal Nursing Course Code: 16PB107 Year: 1</p>	<p>CO1: Apply knowledge of physiological changes and management of women in ante, intra, post-partum conditions in the clinical settings. CO2: Describe perioperative nursing care for obstetrics conditions. CO3: Explain the physiology of lactation and advice on management of breast feeding.</p>
<p>Course Name: Child Health Nursing Course Code: 16PB108 Year: 1</p>	<p>CO1: Explain the modern concept pediatric assessment, and growth and development of children. CO2: Explain the common neonatal and pediatric conditions. CO3: Identify various aspects of preventive pediatric nursing and apply them in providing nursing care to children in hospital and community.</p>
<p>Course Name: Medical Surgical Nursing Course Code: 16PB109 Year: 1</p>	<p>CO1: Apply medical and surgical nursing knowledge in delivering holistic care to adult clients with various medical and surgical conditions. CO2: Integrate ethic and professionalism in caring for clients with various medical and surgical conditions in clinical settings. CO3: Design appropriate nursing care plans for clients with various medical and surgical conditions in clinical settings.</p>
<p>Course Name: English Course Code: 16PB110 Year: 1</p>	<p>CO1: Speak and write grammatically correct English CO2: Develop skill in spoken English</p>
<p>Course Name: Sociology Course Code: 16PB201 Year: 2</p>	<p>CO1: Describe sociological concepts that are applicable to nursing. CO2: Determine role of sociology in nursing as related to social institutions in India CO3: Develop positive attitudes towards individual, family and community</p>
<p>Course Name: Community Health Nursing Course Code: 16PB202 Year: 2</p>	<p>CO1: Explain the expansion and principles of health services and practices in primary health care to the community. CO2: Explain the various activities health programmes and health clinics. CO3: Demonstrate correct nursing procedures in various settings related to community nursing sciences</p>


 DAYANANDA SAGAR UNIVERSITY
 HOSUR, KARNATAKA 562112

M.Sc. NURSING

COURSE OUTCOMES (COs)

COURSE DETAILS	COURSE OUTCOMES (COs)
<p>Course Name: Nursing Education Course Code: 16MSN101 Year: 1</p>	<p>C01: Explain the philosophies, principles in nursing education and trends in teaching and learning in nursing. C02: Critically discuss the instructional methods and media; various nursing educational programs. C03: Discuss the process of curriculum development and administration, guidance and counseling of students. C04: Identify accreditation process, research in nursing education and various models in nursing education. C05: Construct the tools for evaluation of knowledge, skill and attitude.</p>
<p>Course Name: Advance Nursing Practice Course Code: 16MSN102 Year: 1</p>	<p>C01: Critically discuss professionalism, professional values & ethics related to bio-psycho-social aspect in nursing. C02: Apply the nursing process in providing excellent holistic nursing care for diverse clients with appropriate nursing theory application. C03: Identify the latest research trends in extended and expanded role of nurse in advanced nursing practice. C03: Demonstrate values, attitude and professionalism in performing nursing procedures to diverse clients. C04: Appreciate the importance personal and professional development; computer application in patient care.</p>
<p>Course Name: Nursing Research Course Code: 16MSN103 Year: 1</p>	<p>C01: Critically discuss research and research process. C02: Integrate moral values, ethics and professionalism in preparing a research proposal. C03: Generate scientific reports based on the findings of dissertation.</p>

[Signature]
PRINCIPAL

<p>Course Name: Statistics Course Code: 16MSN104 Year: 1</p>	<p>CO1: Explain descriptive and inferential statistics. CO2: Discuss the organization, tabulation and presentation of data. CO3: Apply vital health statistics and statistical package for data analysis.</p>
<p>Course Name: Medical-Surgical Nursing (Clinical Speciality I) Course Code: 16MSN105 Year: 1</p>	<p>CO1: Apply medical and surgical nursing knowledge in delivering holistic care to adult clients with various medical and surgical conditions. CO2: Integrate trends, ethic and professionalism in caring for clients with various medical and surgical conditions in clinical settings. CO3: Design appropriate nursing care plans for clients with various medical and surgical conditions in clinical settings. CO4: Incorporate evidence-based nursing practice in the field of Medical-surgical nursing.</p>
<p>Course Name: Obstetrics and Gynaecology Nursing (Clinical Speciality I) Course Code: 16MSN106 Year: 1</p>	<p>CO1: Apply knowledge of physiological changes and management of women in ante, intra, post-partum conditions in the community and clinical settings. CO2: Integrate trends, ethic and professionalism in caring for pregnant women and their family in clinical and community settings. CO3: Demonstrate self-confidence, respect and social communication while caring for pregnant women in the clinical and community settings. CO4: Incorporate evidence-based nursing practice in the field of Obstetrics and Gynaecology Nursing.</p>
<p>Course Name: Child Health Nursing (Clinical Speciality I) Course Code: 16MSN107 Year: 1</p>	<p>CO1: Discuss the modern concept pediatric assessment, and growth and development of children. CO2: Explain the common neonatal and pediatric conditions. CO3: Identify various aspects of preventive pediatric nursing and apply them in providing nursing care to children in hospital and community. CO4: Incorporate evidence-based nursing practice in the field of neonatal Nursing.</p>
<p>Course Name: Mental Health Nursing (Clinical Speciality I)</p>	<p>CO1: Discuss the trends and issues, psychobiology and theories of personality development relevant to mental health nursing.</p>

Abhishek
PRINCIPAL

<p>Course Code: 16MSN108 Year: 1</p>	<p>C02: Identify stress management, assertive training, therapeutic communication and nursing management of individual with mental health conditions. C03: Identify the specific needs, treatment and care for patients with mental illness. C04: Incorporate evidence-based nursing practice in the field of Mental health Nursing.</p>
<p>Course Name: Community Health Nursing (Clinical Speciality I) Course Code: 16MSN109 Year: 1</p>	<p>C01: Discuss the trends and scope of community health nursing and concept of health. C02: Incorporate the community nursing aspects of population dynamics, disaster nursing and maternal and neonatal care. C03: Explain the principles of health services and nursing practices in in community settings. C04: Incorporate evidence-based nursing practice in the field of Community Health Nursing.</p>
<p>Course Name: Nursing Management Course Code: 16201 Year: 2</p>	<p>C01: Explain the philosophy, objectives, and trends and issues in health care at various levels. C02: Explain the principles and process of administration and management in nursing. C03: Discuss the principles and methods leadership for personnel management and organizational behavior. C03: Critically discuss the importance of nursing informatics and legal and ethical issues nursing.</p>
<p>Course Name: Medical-Surgical Nursing (Cardio-thoracic Nursing) Clinical Speciality II Course Code: 16MSN202-A Year: 2</p>	<p>C01: Apply medical and surgical nursing knowledge in delivering holistic care to adult clients with various cardio-thoracic conditions. C02: Integrate trends, ethic and professionalism in caring for clients with various cardio-thoracic conditions in clinical settings. C03: Design appropriate nursing care plans for clients with various cardio-thoracic conditions in clinical settings. C04: Incorporate evidence-based nursing practice in the field of cardio-thoracic nursing.</p>
<p>Course Name: Obstetrics and Gynaecology Nursing (Clinical Speciality II) Course Code: 16MSN203 Year: 2</p>	<p>C01: Apply obstetrics and gynaecological nursing knowledge in delivering holistic care to women with various obstetrics and gynaecological conditions in clinical and community settings. C02: Apply nursing knowledge in delivering care for various obstetric and neonatal emergencies in the community and clinical settings.</p>


PRINCIPAL, Sciences
 College Of Nursing
DAYANANDA SAGAR UNIVERSITY
 Harohalli, Karnataka-562112

<p>Course Name: Child Health Nursing (Clinical Speciality II) Course Code: 16MSN204 Year: 2</p>	<p>CO3: Demonstrate self-confidence, respect and social communication while caring for women and their family in the clinical and community settings. CO4: Incorporate evidence-based nursing practice in the field of Obstetrics and Gynaecology Nursing.</p>
<p>Course Name: Mental Health Nursing (Clinical Speciality II) Course Code: 16MSN205 Year: 2</p>	<p>CO1: Discuss current trends, research work and management in pediatric nursing. CO2: Apply nursing knowledge in delivering holistic care for various infant and children with medical surgical conditions. CO3: Utilize the recent technology in diagnosis and various treatment modalities in the management of high risk children and pediatric emergencies.</p>
<p>Course Name: Community Health Nursing (Clinical Speciality II) Course Code: 16MSN206 Year: 1</p>	<p>CO1: Apply nursing knowledge in delivering holistic care to a client with various mental health disorders. CO2: Identify crisis management, assertive training, therapeutic communication and nursing management of individual with mental health disorders. CO3: Utilize the recent technology in diagnosis and various treatment modalities in the management of patients with mental disorders and emergencies. CO4: Incorporate evidence-based nursing practice in the field of Mental health Nursing.</p>
<p>Course Name: Community Health Nursing (Clinical Speciality II) Course Code: 16MSN206 Year: 1</p>	<p>CO1: Discuss the trends and issues of community health nursing in various aspects. CO2: Apply the community nursing knowledge for community health assessment and application of nursing process for the individual and family in the community. CO3: Participate in the implementation of various national health programmes and research work in community settings. CO4: Apply leadership skill for supervising health workers and providing health education.</p>


PRINCIPAL
College of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY
Harohalli, Kachatakuru-562112.

CO-PO Mapping

Course Name : Nursing Foundation I

Course Code : N-NF (I) 125

COs	Program Outcomes (POs)									
	1 Patient centered care	2 Professionalism	3 Teaching & Leadership	4 System based practice	5 Health informatics and technology	6 Community education	7 Team work and collaboration	8 Safety	9 Quality Improvement	10 Evidence based practice
CO1	3	-	-	1	2	1	2	-	-	2
CO2	3	2	-	2	2	3	-	2	2	2
CO3	3	3	3	2	2	2	2	1	1	-
CO4										
CO5										
CO6										

1- Low

2- Moderate

3- High

- CO1 Explain the impact of past nursing practice to contemporary nursing practice
- CO2 Perform basic nursing procedures in simulated clinical settings.
- CO3 Demonstrate values, attitude and professionalism in performing basic nursing procedures.

CO-PO Mapping

Course Name : Nursing Foundation I (Practical I)

Course Code : N-NF (I) 125

COs	Program Outcomes (POs)									
	1 Patient centered care	2 Professionalism	3 Teaching & Leadership	4 System based practice	5 Health informatics and technology	6 Communication	7 Team work and collaboration	8 Safety	9 Quality Improvement	10 Evidence based practice
CO1	3	-	-	1	2	1	2	-	-	2
CO2	3	2	3	2	2	3	-	2	2	2
CO3	3	3	3	2	2	2	3	1	1	-
CO4										
CO5										
CO6										

1- Low 2- Moderate 3-High

- CO1 Perform basic nursing procedures in the clinical settings.
- CO2 Demonstrate self-confidence, respect and social communication while performing basic nursing procedures.
- CO3 Demonstrate effective communication and teamwork skills while performing basic nursing procedures.

Ashwath
PRINCIPAL
 College Of Nursing Sciences
 DAYANANDA SAGAR UNIVERSITY
 Hithoballi, Karnataka-562112

Course Name : Nursing Foundation II

CO-PO Mapping

Course Code : N-NF (II) 125

COs	Program Outcomes (POs)									
	1 Patient centered care	2 Professio nalism	3 Teaching & Leadershi p	4 System based practice	5 Health informati cs and technolog y	6 Communi cation	7 Team work and collabora tion	8 Safety	9 Quality Improve ment	10 Evidence based practice
CO1	3	-	-	1	2	1	2	-	-	2
CO2	3	2	-	2	2	3	-	2	2	2
CO3	3	3	3	2	2	2	2	1	1	-
CO4	3	2	-	-	-	2	2	3	-	2

1- Low 2- Moderate 3- High

- CO1 Use the nursing process in providing excellent care for diverse clients.
- CO2 Perform respiratory, nutritional, elimination, fluid and electrolyte therapy and 'last office' nursing procedures to diverse clients.
- CO3 Demonstrate values, attitude and professionalism in performing nursing procedures to diverse clients
- CO4 Perform first aid measures during emergencies.

Abhishek

PRINCIPAL
College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY
Harohalli, Karnataka-562112

CO-PO Mapping

Course Name : Nursing Foundation I (Practical II)

Course Code : N-NF (II) 125

COs	Program Outcomes (POs)									
	1 Patient centered care	2 Professionalism	3 Teaching & Leadership	4 System based practice	5 Health informatics and technology	6 Community orientation	7 Team work and collaboration	8 Safety	9 Quality Improvement	10 Evidence based practice
CO1	3	-	-	1	2	1	2	-	-	2
CO2	3	3	3	2	2	3	3	2	2	2
CO3	3	3	3	1	2	2	3	1	2	3
CO4										
CO5										
CO6										

1- Low

2- Moderate

3-High

- CO1 Apply theoretical knowledge as gained in the theory session
- CO2 Demonstrate caring attitude and good communication skills with patients and staff.
- CO3 Demonstrate practical skills in all designated procedures as indicated in the log book for Semester 2.

CO-PO Mapping

Course Name : Adult Health Nursing I (Theory)

Course Code : N-AHN (I) 215

COs	Program Outcomes (POs)									
	1 Patient centered care	2 Professio nalism	3 Teaching & Leadershi p	4 System based practice	5 Health informati cs and technolog y	6 Communi cation	7 Team work and collabora tion	8 Safety	9 Quality Improve ment	10 Evidence based practice
CO1	3	-	-	1	2	1	2	-	-	2
CO2	3	2	-	2	2	3	-	2	2	2
CO3	3	3	3	2	2	2	2	1	1	-
CO4				1			3	2	2	3
CO5										
CO6										

1- Low 2- Moderate 3- High

- CO1 Apply medical and surgical nursing knowledge in delivering holistic care to adult clients with various medical and surgical conditions.
- CO2 Integrate ethic and professionalism in caring for clients with various medical and surgical conditions in clinical settings.
- CO3 Design appropriate nursing care plans for clients with various medical and surgical conditions in clinical settings.
- CO4 Perform Basic nursing procedures and basic CPR.


PRINCIPAL
 College Of Nursing Sciences
 DAYANANDA SAGAR UNIVERSITY
 Hiranahalli, Karnataka-562112

CO-PO Mapping

Course Name : Adult Health Nursing I (Practical)

Course Code : N-AHN (I) 215

COs	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
CO1	3	-	-	1	2	1	2	-	-	2
CO2	3	2	-	2	2	3	-	2	2	2
CO3	3	3	3	2	2	2	2	1	1	-
CO4										
CO5										
CO6										

1-Low

2-Moderate

3-High

- CO1 Perform nursing procedures related to caring for patients with various medical and surgical conditions in the clinical settings.
- CO2 Demonstrate self-confidence, respect and social communication while caring for patients with medical and surgical conditions in the clinical settings.
- CO3 Demonstrate effective communication and teamwork skills while caring for patients with various medical and surgical conditions in the clinical settings.

CO-PO Mapping

Course Name : Adult Health Nursing II (Theory)

Course Code : NAHN (II) 225

COs	Program Outcomes (POs)									
	1 Patient centered care	2 Professionalism	3 Teaching & Leadership	4 System based practice	5 Health informatics and technology	6 Communication	7 Team work and collaboration	8 Safety	9 Quality Improvement	10 Evidence based practice
CO1	3	-	-	1	2	1	2	-	-	2
CO2	3	2	-	2	2	3	-	2	2	2
CO3	3	3	3	2	2	2	2	1	1	-
CO4	3	2		1	1		3	2	2	3
CO5										
CO6										

1- Low

2- Moderate

3-High

- CO1 Perform nursing procedures related to caring for adult and geriatric clients with various medical and surgical conditions in the clinical settings.
- CO2 Demonstrate self-confidence, respect and social communication while caring for adult and geriatric clients with various medical and surgical conditions in the clinical settings.
- CO3 Design appropriate nursing care plans for adult and geriatric clients with various medical and surgical conditions in clinical settings.
- CO4 Practice managerial skills for delivering nursing care in the clinical settings.

CO-PO Mapping

Course Name : Adult Health Nursing II PRATICAL

Course Code : N-AHN (II) 225

P

COs	Program Outcomes (POs)									
	1 Patient centered care	2 Professionalism	3 Teaching & Leadership	4 System based practice	5 Health informatics and technology	6 Communication	7 Team work and collaboration	8 Safety	9 Quality Improvement	10 Evidence based practice
CO1	3	-	-	1	2	1	2	-	-	2
CO2	3	2	-	2	2	3	-	2	2	2
CO3	3	3	3	2	2	2	2	1	1	-
CO4	3	2		1	1		3	2	2	3
CO5										
CO6										

1- Low

2- Moderate

3-High

- CO1 Perform nursing procedures related to caring for adult and geriatric clients with various medical and surgical conditions
- CO2 Demonstrate self-confidence, respect and social communication while caring for adult and geriatric clients with various
- CO3 Design appropriate nursing care plans for adult and geriatric clients with various medical and surgical conditions in clinical
- CO4 Practice managerial skills for delivering nursing care in the clinical settings.

F. P. S. well
 COLLEGE
 College for Nursing Sciences
 BAYAN LAMPUNG SASAKA UNIVERSITY
 Jember, Indonesia. 6122117



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES
CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	
	Patient centered care: Provide holistic care recognizing individual patient's preferences, values and needs, that is compassionate, coordinated, age and culturally appropriate safe and effective care	Professionalism: Demonstrate accountability for the delivery of standard-based nursing care as per the Council standards that is consistent with moral, altruistic, legal, ethical, regulatory, and humanistic principles	Teaching & Leadership: Influence the behavior of individuals and groups within their environment and facilitate establishment of shared goals through teaching and leadership	System based practice: Demonstrate awareness and responsiveness to the context of health care system and ability to manage resources essential to provide optimal quality of care	Health informatics and Technology: Use technology and synthesize information and collaborate to make critical decisions that optimize patient outcomes	Communication: Interact effectively with patients, families and colleagues fostering mutual respect and shared decision making to enhance patient satisfaction and health outcomes	Teamwork and Collaboration: Function effectively with in nursing and interdisciplinary teams, fostering open communication, mutual respect, shared decision making, team learning	Safety: Minimize risk of harm to patients and providers through both system effectiveness and individual performance			
I Year											
English								1		1	
Anatomy	1	1									
Physiology	1	1									
Nutrition	1	1		2		1				1	
Biochemistry	1	1									
Nursing Foundation											
Psychology	2	1	2	2	2	1	2	2	2	2	
Microbiology	1	1									
Introduction to Computers	1	1				1					
II Year											
Sociology	2	1						1		1	
Pharmacology	1			2							
Pathology	2	1									
Genetics	2	1									
Medical Surgical Nursing (Adult including geriatrics)-I	2	3	3	2	3	2	3	3	3	3	
Community Health Nursing - I	2	1	2	1	2	2	3	3	2	2	
Communication & Education Technology					2		3	3	2	3	
Environmental Studies		2				2					
III Year											
Medical Surgical Nursing (Adult including geriatrics)-II	2	3	3	2	3	2	3	3	3	3	
Child Health Nursing	2	3	3	2	3	2	3	3	3	3	
Mental Health Nursing	2	3	3	2	3	2	3	3	3	3	
Nursing Research and Statistics				2	1						
IV Year											
Midwifery and Obstetrical Nursing	2	3	3	2	3	2	3	3	3	3	
Community Health Nursing-II	2	3	3	2	3	2	3	3	3	3	
Management of											

Principal



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES
CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
	Explore research as evidence for enhancing and changing practice	Discuss the health strategies in promoting, maintaining and restoring health and well-being	Demonstrate proficiency in written, verbal and digital skills at individual and collaborative levels	Apply critical thinking skills and ethical decision making required for advancing practice	Demonstrate the ability to undertake independent learning activities	Value the contribution of research in advancing practice in the provision of quality care	Evaluate leadership and management skills for working in collaborative teams in the provision of quality outcome	Recognize the need for the advancement of professional practice through contributions to education administration, health care policy and knowledge development
I Year								
Nursing Education	1	2		2				1
Advanced Nursing Practice	2	2	1	1	1	1	2	1
Clinical Speciality I								
Medical-Surgical Nursing I	2	2	1	1	1	1	2	1
Obstetrics & Gynaecology Nursing I	2	2	1	1	1	1	2	1
Paediatric Nursing I	2	2	1	1	1	1	2	1
Psychiatric Nursing I	2	2	1	1	1	1	2	1
Community Health Nursing I	2	2	1	1	1	1	2	1
Nursing Research and Statistics	1				1		2	1
II Year								
Nursing Management	2			2	2	1	2	1
Clinical Speciality II								
Medical-Surgical Nursing II	2	2	2	2	2	1	2	1
Obstetrics & Gynaecology Nursing	2	2	2	2	2	1	2	1
Paediatric Nursing I	2	2	2	2	2	1	2	1
Psychiatric Nursing II	2	2	2	2	2	1	2	1
Community Health Nursing II	2	2	2	2	2	1	2	1
Dissertation	1			1			2	

Key: A-Apply-1

M-Mastery-2

Aswath
PRINCIPAL
 College Of Nursing Sciences



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES
CD-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	PO1: Patient centered care: Provide holistic care recognizing individual patient's preferences, values and needs, that is compassionate, coordinated, age and culturally appropriate safe and effective care	PO2: Professionalism: Demonstrate accountability for the delivery of standard-based nursing care as per the Council standards that is consistent with moral, spiritual, legal, ethical, regulatory and humane principles	PO3: Teaching & Leadership: Influence the behavior of individuals and groups within their environment and facilitate achievement of shared goals through teaching and leadership	PO4: System based practice: Demonstrate awareness and responsiveness to the context of health care system and ability to manage resources essential to provide optimal quality of care	PO5: Health Informatics and Technology: Use technology and evidence based information and collaborate to make critical decisions that optimize patient outcomes	PO6: Communication: Interact effectively with patients, families and colleagues, fostering mutual respect and shared decision making to enhance patient satisfaction and health outcomes	PO7: Teamwork and Collaboration: Function effectively with in nursing and interdisciplinary teams, fostering open communication, mutual respect, shared decision making, team learning and development	PO8: Safety: Minimize risk of harm to patients and providers through both system effectiveness and individual performance	PO9: Quality Improvement: Use data to monitor the outcomes of care processes and utilize improvement methods to design and test changes to continuously improve the quality and safety of health care system	PO10: Evidence based practice: Identify, evaluate and use the best current evidence coupled with clinical expertise and consideration of patient's preferences, experience and values to make practical decisions
I Year										
Nursing Foundation	2	3	2	2						
Nutrition & Dietetics	1									
Biochemistry & Biophysics	1									
Psychology	1									
Microbiology	1									
Maternal Nursing	3	3	3	3	3	3		3		3
Child Health Nursing	3	3	3	3	3	3		3		3
Medical Surgical Nursing	3	3	3	3	3	3		3		3
English					1					
II Year										
Sociology	1									
Community Health Nursing	1	3	3	3	3	3	3	3	3	3
Mental Health Nursing	3	3	3	3	3	3		3		3
Introduction to Nursing Education					2			3		
Introduction to Nursing Service Administration					3			3		
Introduction to Nursing Research & Statistics										2

Key: R- Reinforce - 1

A-Apply - 2

M-Mastery - 3

Dayananda Sagar University
College of Nursing Sciences
B-1, 2nd Floor
Kamataka-562112



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES
CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	
	Patient centered care: Provide holistic care recognizing individual patient's preferences, values and needs, that is compassionate, coordinated, age and culturally appropriate safe and effective care	Professionalism: Demonstrate accountability for the delivery of standard-based nursing care as per the Council standards that is consistent with moral, altruistic, legal, ethical, regulatory and humanistic principles	Teaching & Leadership: Influence the behavior of individuals and groups within their environment and facilitate establishment of shared goals through teaching and leadership	System based practice: Demonstrate awareness and responsiveness to the context of health care system and ability to manage resources essential to provide optimal quality of care	Health informatics and Technology: Use technology and synthesize information and collaborate to make critical decisions that optimize patient outcomes	Communication: Interact effectively with patients, families and colleagues fostering mutual respect and shared decision making to enhance patient satisfaction and health outcomes	Function effectively with in nursing and interdisciplinary teams, fostering open communication, mutual respect, shared decision making, team learning and development	Safety: Minimize risk of harm to patients and providers through both system effectiveness and individual performance	monitor the outcomes of care processes and utilize improvement methods to design and test changes to	evaluate and use the best current evidence coupled with clinical expertise and consideration of	
I Year											
English											
Anatomy	1			1				1		1	
Physiology	1			1						1	
Nutrition	1	1				1		2		1	
Biochemistry	1	1		1						1	
Nursing Foundation	1	1	1	1	2	2	1	3	1	1	
Psychology	2	1	2	2	2	1	2	2	2	2	
Microbiology	1			1						1	
Introduction to Computers	1					1		2		2	
II Year											
Sociology	2	1	1			2	3	1		1	
Pharmacology	1	1		2				1	2	3	
Pathology	2	1									
Genetics	2	1									
Medical Surgical Nursing (Adult including geriatrics)-I	2	3	3	2	3	2	3	3	3	3	
Community Health Nursing - I	2	1	2	1	2	2	3	3	2	2	
Communication & Education Technology			1		2		3		2	3	
III Year											
Medical Surgical Nursing (Adult including geriatrics)-II	2	3	3	2	3	2	3	3	3	3	
Child Health Nursing	2	3	3	2	3	2	3	3	3	3	
Mental Health Nursing	2	3	3	2	3	2	3	3	3	3	
Nursing Research and Statistics				2	1	2		2	2	3	
IV Year											
Midwifery and Obstetrical Nursing	2	3	3	2	3	2	3	3	3	3	
Community Health Nursing- II	2	3	3	2	3	2	3	3	3	3	
Management of Nursing Service and Education	2	2		2	1		3	3	3	3	

Introduce-1 Apply-2 Mastery-3

Principals
PRINCIPAL,
 College Of Nursing Sciences
 DAYANANDA SAGAR UNIVERSITY



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES
CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	
	Patient centered care: Provide holistic care recognizing individual patient's preferences, values and needs, that is compassionate, coordinated, age and culturally appropriate safe and effective care.	Professionalism: Demonstrate accountability for the delivery of standard-based nursing care as per the Council standards that is consistent with moral, altruistic, legal, ethical, regulatory and humanistic principles.	Teaching & Leadership: Influence the behavior of individuals and groups within their environment and facilitate establishment of shared goals through teaching and leadership.	System based practice: Demonstrate awareness and responsiveness to the context of health care system and ability to manage resources essential to provide optimal quality of care.	Health informatics and Technology: Use technology and synthesize information and collaborate to make critical decisions that optimize patient outcomes.	Communication: Interact effectively with patients, families and colleagues fostering mutual respect and shared decision making to enhance patient satisfaction and health outcomes.	Function effectively with in nursing and interdisciplinary teams, fostering open communication, mutual respect, shared decision making, team learning.	Safety: Minimize risk of harm to patients and providers through both system effectiveness and individual performance.	monitor the outcomes of care processes and utilize improvement methods to design and test changes to evaluate and use the best current evidence coupled with clinical expertise and consideration of		
I Year											
Nursing Foundation	2	1	2	2						1	
Nutrition & Dietetics	1										
Biochemistry & Biophysics	1										
Psychology	1										
Microbiology	1										
Maternal Nursing	3	3	3	3	3	3		3		2	
Child Health Nursing	3	3	3	3	3	3		3		#	
Medical Surgical Nursing	3	3	3	3	3	3		3		#	
English					1			3		#	
II Year											
Sociology	1										
Community Health Nursing	3	3	3	3	3	3		3	#	#	
Mental Health Nursing	3	3	3	3	3	3	3	3	#	#	
Introduction to Nursing				3	2	2		2		#	
Introduction to Nursing Service Administration			3	3	3	3	3	3	#	3	
Introduction to Nursing Research & Statistics									#	#	

Key: R-Reinforce -1

A-Apply -2

M-Mastery -3

Shival

PRINCIPAL
 College Of Nursing Sciences
 DAYANANDA SAGAR UNIVERSITY
 Bangalore, Karnataka-562112



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES
CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PO1: Patient centered care: Provide holistic care recognizing individual patient's requirements, values and needs that is congruent with professional, legal and regulatory requirements and an efficient client-professional relationship.										
PO2: Professionalism: Accountability for the delivery of standard based nursing care as per the Council standards that is consistent with moral, scientific, legal, ethical, regulatory and humanistic principles.										
PO3: Teaching & Leadership: Influence the behavior of students and groups within their own institution and facilitate establishment of shared goals through teaching and leadership.										
PO4: System based practice: Demonstrate awareness and responsiveness to the needs of health care system and ability to manage resources essential to provide optimal quality of care.										
PO5: Health Informatics and Technology: Use technology and evidence based information and collaborate to make critical decisions that optimize patient outcomes.										
PO6: Communication: Interact effectively with patients, families and colleagues fostering mutual respect and shared decision making to enhance patient satisfaction and health outcomes.										
PO7: Teamwork and Collaboration: Function effectively with nursing and interdisciplinary teams, creating a safe environment, mutual respect, shared decision making, team learning and self-direction.										
PO8: Safety: Minimize risk of harm to patients and providers through both system effectiveness and individual performance.										
PO9: Quality Improvement: Use data to monitor the outcomes of care processes and utilize improvement methods to design and test changes to continuously improve the quality and safety of health care systems.										
PO10: Evidence based practice: Identify, evaluate and use the best current evidence alongside with clinical expertise and consideration of patient's preferences, experience and values to make practice decisions.										
I Semester										
Communicative English										1
Applied Anatomy	1			1						1
Applied Physiology	1									1
Applied Psychology	1	1				1		1		1
Applied Sociology	1	1		1						1
Nursing Foundation I	3	1	1	1	2	2	1	3	1	1
Nursing Foundation I Practical										1
II Semester										
Applied Biochemistry	2	1	2	2	2	1	2	2	2	2
Applied Nutrition & Dietetics	1			1						1
Nursing Foundation II	1									1
Nursing Foundation II Practical										1
Health Nursing (Informatics & Technology)										
III Semester										
Applied Microbiology & Infection Control	2	1	1			2	1	1		1
Adult Health Nursing I	1	1		2				1	2	1
Pharmacology I										1
Pathology I	2	1								
Adult Health Nursing I Practical	2	1								1
IV Semester										
Pharmacology II	2	1	3	2	2	2	3	2	3	1
Pathology II & Genetics	2	1	2	1	2	2	1	3	2	2
Adult Health Nursing II			1		2		3		2	3
Adult Health Nursing II Practical	2	1	1	2	3	2	3	1	1	1
Nutrition and Dietetics										
V Semester										
Child Health Nursing I	2	3	1	2	3	2	3	1	3	1
Mental Health Nursing I	2	3	1	2	3	2	3	3	1	2
Community Health Nursing I including Environmental sciences and Epidemiology	2	1	3	2	3	2	3	3	1	3
Educational technology & Nursing Education				2	1	2		2	2	1
Introduction to Evidence based nursing & Infection										
VI Semester										
Child Health Nursing II	2	3	3	2	3	2	3	1	3	1
Mental Health Nursing II	2	3	3	2	3	2	3	1	3	1
ODG Nursing I including SPA module	2	1	3	2	3	2	3	3	3	1
Nursing Management & Leadership	2	3	3	2	3	2	3	1	3	2
VII Semester										
Community Health Nursing II	2	1	3	2	3	2	3	3	1	2
Nursing Research & Statistics	2	3	3	2	3	2	3	1	3	1
ODG Nursing II including Self delivery module	2	1	3	2	3	2	3	3	3	1
VIII Semester										
Internship	1	1	1	1	1	1	1	1	1	1

Handwritten signature/initials



Max. Marks: 75 Marks
Duration: 3 Hours

Date: 04-08-2023
Time: 10am-1pm

SESSIONAL EXAM - III
B.Sc. NURSING - IV YEAR
MIDWIFERY & OBSTETRICAL NURSING

		Marks	COS
I	LONG ESSAY (ANSWER ANY TWO)	10x2=20	
1a.	Define post-partum haemorrhage	2	CO1
1b.	List out causes and management of true postpartum haemorrhage	8	CO2
2a	Define rupture of uterus?	2	CO1
2b.	Explain the causes and surgical & nursing management of rupture of uterus	8	CO3
3a.	Define low birth weight babies	2	CO1
3b.	Explain nursing management of low birth weight babies	8	CO3
II	SHORT ESSAY (ANSWER ANY SEVEN)	5X7=35	
4	Oxytocin	5	
5	Explain role of nurse in family welfare programme	5	CO3
6	Discuss amniotic fluid embolism	5	CO1
7	Explain uterine inertia	5	CO1
8	Describe destructive operations	5	CO1
9	Discuss steps of manual removal of placenta	5	CO1
10	Explain how to control infection in NICU	5	CO1
11	Discuss meconium aspiration syndrome	5	CO1
12	Explain organization of NICU	5	CO1
III	SHORT ANSWERS (ANSWER ALL)	10X2=20	
13	Define postpartum blues	2	CO1
14	List any four birth injuries	2	CO1
15	Enlist any four malformations of newborn	2	CO1
16	Define cord presentation	2	CO1
17	Expand LATCH	2	CO1
18	List nurses responsibilities in administering MgSO4	2	CO1
19	Enlist causes of puerperal pyrexia	2	CO1
20	What is kernicterus	2	CO1
21	List causes male infertility	2	CO1
22	Side effects of IUCD	2	CO1

*CO – Course Outcomes

All the COs listed at the bottom of the page

CO-1	Apply knowledge of physiological changes and management of women in ante, intra, post-partum and gynecological conditions in the clinical settings.
CO-2	Describe nursing care for patient with obstetrics and gynecology conditions.
CO-3	Plan suitable nursing care by using problem solving and scientific skills for clients with obstetrics and gynecology conditions in the clinical settings.

Principal
PRINCIPAL



Max. Marks: 75 Marks
Duration: 3 Hours

Date: 25-09-2023
Time: 10am-1pm

MODEL EXAMINATION
B.Sc. NURSING - IV YEAR
MIDWIFERY & OBSTETRICAL NURSING

		Marks	COS
I	LONG ESSAY (ANSWER ANY TWO)	10x2=20	
1a.	Define shock	2	CO1
1b.	Enumerate the clinical features of haemorrhagic shock	3	CO2
1c.	Describe the management of haemorrhagic shock	5	CO3
2a	Define Labour	2	CO1
2b.	Explain physiology & management of 2 nd stage of labour	8	CO2
3a.	Define low birth weight babies	2	CO1
3b.	Explain nursing management of low birth weight babies	8	CO3
II	SHORT ESSAY (ANSWER ANY SEVEN)	5X7=35	
4	Explain about causes of neonatal jaundice	5	CO1
5	Explain the components of partograph	5	CO2
6	Explain the physiology of lactation	5	CO2
7	Explain about measures for prevention of iron deficiency anemia during pregnancy	5	CO2
8	Enumerate the complications of multiple pregnancy	5	CO2
9	Enlist the positive signs of pregnancy	5	CO1
10	Describe the resuscitation of newborn	5	CO2
11	Describe the management of asphyxia neonatorum	5	CO3
12	Explain organization of NICU	5	CO1
III	SHORT ANSWERS (ANSWER ALL)	10X2=20	
13	Define sub involution of uterus	2	CO1
14	List any four birth injuries	2	CO1
15	Mention the sites of ectopic pregnancy	2	CO1
16	List tocolytic agents	2	CO1
17	Expand LATCH	2	CO1
18	What is polarity of uterus	2	CO1
19	Define antenatal care	2	CO1
20	What is physiological jaundice	2	CO1
21	List causes female infertility	2	CO1
22	Define Oslander's sign	2	CO1

*CO – Course Outcomes

All the COs listed at the bottom of the page

CO-1	Apply knowledge of physiological changes and management of women in ante, intra, post-partum and gynecological conditions in the clinical settings
CO-2	Describe nursing care for patient with obstetrics and gynecology conditions.
CO-3	Plan suitable nursing care by using problem solving and scientific skills for clients with obstetrics and gynecology conditions in the clinical settings.



Max. Marks: 75 Marks
Duration: 3 Hours

Date: 25-09-2023
Time: 10am-1pm

MODEL EXAMINATION
B.Sc. NURSING - IV YEAR
MIDWIFERY & OBSTETRICAL NURSING

		Marks	COS
I	LONG ESSAY (ANSWER ANY TWO)	10x2=20	
1a.	Define shock	2	CO1
1b.	Enumerate the clinical features of haemorrhagic shock	3	CO2
1c.	Describe the management of haemorrhagic shock	5	CO3
2a	Define Labour	2	CO1
2b.	Explain physiology & management of 2 nd stage of labour	8	CO2
3a.	Define low birth weight babies	2	CO1
3b.	Explain nursing management of low birth weight babies	8	CO3
II	SHORT ESSAY (ANSWER ANY SEVEN)	5X7=35	
4	Explain about causes of neonatal jaundice	5	CO1
5	Explain the components of partograph	5	CO2
6	Explain the physiology of lactation	5	CO2
7	Explain about measures for prevention of iron deficiency anemia during pregnancy	5	CO2
8	Enumerate the complications of multiple pregnancy	5	CO2
9	Enlist the positive signs of pregnancy	5	CO1
10	Describe the resuscitation of newborn	5	CO2
11	Describe the management of asphyxia neonatorum	5	CO3
12	Explain organization of NICU	5	CO1
III	SHORT ANSWERS (ANSWER ALL)	10X2=20	
13	Define sub involution of uterus	2	CO1
14	List any four birth injuries	2	CO1
15	Mention the sites of ectopic pregnancy	2	CO1
16	List tocolytic agents	2	CO1
17	Expand LATCH	2	CO1
18	What is polarity of uterus	2	CO1
19	Define antenatal care	2	CO1
20	What is physiological jaundice	2	CO1
21	List causes female infertility	2	CO1
22	Define Oslander's sign	2	CO1

*CO – Course Outcomes

All the COs listed at the bottom of the page

CO-1	Apply knowledge of physiological changes and management of women in ante, intra, post-partum and gynecological conditions in the clinical settings
CO-2	Describe nursing care for patient with obstetrics and gynecology conditions.
CO-3	Plan suitable nursing care by using problem solving and scientific skills for clients with obstetrics and gynecology conditions in the clinical settings.



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES

3rd YEAR B. Sc (Nursing)- II Sessional Examinations
Subject: Medical-Surgical Nursing- II (16NS301)

Duration: 03 Hours

Date: 01/12/2023

Time: 10am-1pm

Max Marks: 75

- Note: 1. All Sections are compulsory
2. Draw neat diagrams wherever necessary

Section- I

(Answer all the questions- Long Essay)

2X10= 20 Marks

1. a. Define otitis media. (1 marks) CLO1
b. Explain the pathophysiology of chronic suppurative otitis media (CSOM). (3 marks) CLO2
c. Write Post- Operative care for the patient with Tympanoplasty. (5 marks) CLO3

2. Mr. X, 50 years old male weighing 65kg admitted to burns ward with 40% thermal burns -
Answer the following:
 - a. Define burns and scalds (2 marks) CLO1
 - b. Explain the classification of burns injury according to depth of injury. (4 marks) CLO2
 - a. Explain the fluid requirements for Mr. X for first 48 hours. (5 marks) CLO2

Section- II

(Answer all the questions- Short Essay)

7X5= 35 Marks

3. Enumerate the common drugs used in critical care unit and state their action. CLO2
4. Write a short note on Meniere's disease. CLO3
5. Write a short note on hypovolemic shock. CLO3
6. Explain psychosocial aspects of aging. CLO2
7. Write a short note on burns rehabilitation. CLO2
8. Explain the clinical manifestations and management of Mastoiditis. CLO2
9. Explain the Disaster management cycle and principles of disaster nursing. CLO2

Section- III

(Answer all the questions- Short answer Questions) 10X2= 20 Marks

10. Define disaster. CLO1
11. Audiometry. CLO2
12. Enumerate the any two poisoning and their antidotes. CLO1
13. Define elderly abuse. CLO2
14. Causes for Otitis externa. CLO2
15. Rule of nine. CLO1
16. Define dementia. CLO1
17. Types of skin graft. CLO2
18. Evan's and Parkland formula. CLO2
19. Causes for Natural and manmade disaster. CLO1



DAYANANDA SAGAR UNIVERSITY

USN No:

I Semester B. Sc (Nursing) Sessional Examination-I

Course Title: Applied Sociology

Course Code: SOCI 115

Duration: 1.5 Hours

Date: 06.12.23

Time: 11.30am -1pm

Max Marks: 38 Marks

- Note:
1. All Sections are compulsory
 2. Draw neat diagrams wherever necessary

SECTION - 1	
(Multiple Choice Questions. Each carries ONE Mark) (1x7=07 Marks)	
1.	Medical Sociology will enable the nurse to recognize the (a) Psychological issues (b) significance of social forces in health (c) communicable diseases (d) Social institutions
2.	Father of sociology is (a) Auguste Comte (b) Wilhelm Wundt (c) Claude Bernard (d) Socrates
3.	Sociology is a study of (a) Social life (b) Social institutions (c) Physical science (d) Emotions
4.	Which is not a type of crisis (a) Situational (b) Maturational (c) Social (d) Motivation
5.	In which year the term 'Sociology' was coined? (a) 1798 (b) 1815 (c) 1838 (d) 1857
6.	Social crisis is also known as (a) Adventitious crisis (b) Maturational (c) Situational (d) Motivational
7.	(e) Society symbolizes the network of (a) human relationships (b) orientations (c) Social relationships (d) Interconnections

Abhishek
PRINCIPAL
College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY



Max. Marks: 50 Marks

Duration: 2 Hours

Date: 12-12-2023

Time: 10am-1pm

EXAMINATION
B.Sc. NURSING - IV YEAR
COMMUNITY HEALTH NURSING-II

	Marks	COS
I LONG ESSAY (ANSWER ANY TWO)	10x1=10	
Ia. Define Community Health Nursing	2	CO7
Ib. List the objectives of Community Health Nursing	3	CO7
Ic. Explain the principles of Community Health Nursing	5	CO7
II SHORT ESSAY (ANSWER ANY SEVEN)	5X6=30	
2 Discuss ESI Act	5	CO2
3 Discuss Indian System of medicine	5	CO4
4 Enumerate the recommendations of Bhore committee	5	CO2
5 Explain the legal framework of MTP Act	5	CO2
6 Discuss about ASHA	5	CO5
7 Explain about National Population Policy	5	CO1
III SHORT ANSWERS (ANSWER ALL)	5X2=10	
8 TBA	2	CO5
9 Occupational Hazards	2	CO4
10 Define antenatal care	2	CO6
11 Vital Statistics	2	CO4
12 Health problems in India	2	CO1

*CO – Course Outcomes

All the COs listed at the bottom of the page

CO1	Define, concepts scope, principle sand historical development community health and community health nursing
CO2	Describe health plans, policies various health committees and health problems in India
CO3	Describe the system of delivery of community health services in rural and urban
CO4	Explain the components of health services
CO5	Describe community health nursing approaches, concepts and responsibilities of nursing personnel
CO6	Describe and appreciate the activities of community health nurse in assisting individuals and groups to promote and maintain their health
CO7	Describe National health programmes, various health schemes, family welfare programmes and role of nurse
CO8	Explain the roles and functions of various national and international health agencies

Principals
PRINCIPAL

College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY
Harohalli, Karnataka-562112



Date: 15-05-2024
Duration: 3 Hours

Max. Marks: 75 Marks
Time: 10 am – 1pm

SESSIONAL EXAM-I
M.Sc. NURSING- I YEAR
COURSE: OBSTETRICS & GYNAECOLOGICAL NURSING-I

		Marks	COs
I	LONG ESSAY (ANSWER ALL)	20x3=60	
1.	Explain health care delivery system	20	2
2a.	Describe magnitude of maternal and child health problems	10	1
2b.	Explain issues of maternal and child health	10	1
3a.	Discuss role of nurse in family welfare programs	10	2
3b.	Explain role of independent nurse midwifery practitioner	10	1
II	SHORT ESSAY (ANSWER ANY THREE)	5X3=15	
4.	Preventive obstetrics	5	1
5.	Menstrual cycle	5	1
6.	Fetal development	5	1
7.	Evidence based midwifery practice	5	4
8.	National Rural Health Mission	5	2

*CO – Course Outcomes
All the COs listed at the bottom of the page

CO-1	Apply knowledge of physiological changes and management of women in ante, intra, post-partum conditions in the community and clinical settings.
CO-2	Integrate trends, ethic and professionalism in caring for pregnant women and their family in clinical and community settings.
CO-3	Demonstrate self-confidence, respect and social communication while caring for pregnant women in the clinical and community settings.
CO-4	Incorporate evidence-based nursing practice in the field of Obstetrics and Gynaecology Nursing.

Abheer
PRINCIPAL
College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY
Bengaluru - 560078



DAYANANDA SAGAR UNIVERSITY
SCHOOL OF HEALTH SCIENCES - COLLEGE OF NURSING SCIENCES
Shavige Malleshwara Hills, Kumaraswamy Layout, Bangalore-560078.

Max. Marks: 75 Marks

Duration: 03 Hrs

Date: 08.05.2024

Time: 01:30 PM to 04:30 PM

I SESSIONAL EXAM
I YEAR PB B.SC NURSING
COURSE: -MENTAL HEALTH NURSING 16PB203

I	LONG ESSAY: (ANSWER ANY TWO)	10 x 2 =20	CO
	1. Explain principles of mental health nursing.		CO1
	2. What is Schizophrenia? Explain Causes and clinical features of it.		CO5
	3. Write in detail about mental status examination.		CO4
II	SHORT ESSAY: (ANSWER ANY SEVEN)	5 X 7 = 35	
	4. Mental Health Team		CO1
	5. Concept of normal and abnormal behavior		CO1
	6. Mini Mental Status Examination.		CO4
	7. Depression.		CO5
	8. Explain clinical types of schizophrenia.		CO5
	9. Nursing management for schizophrenia patient.		CO2
	10. Mania and it's management		CO5
	11. Mental Health Act.		CO1
	12. Classification of mental disorders.		CO2
III	SHORT ANSWERS (ANSWER ALL)	10 X 2 = 20	
	13. Delusion & Hallucination		CO5
	14. 4 E's of elevated mood.		CO5
	15. Enlist Schneider's first rank symptoms of schizophrenia.		CO5
	16. What is echolalia and echopraxia?		CO3
	17. Define dysthymia and cyclothymia.		CO3
	18. 4 A's of schizophrenia.		CO5
	19. Positive & negative symptoms of schizophrenia.		CO5
	20. What is catatonic stupor and excitement?		CO5
	21. Define capgras syndrome.		CO5
	22. Write 2-3 difference between Bipolar I and Bipolar II mood disorder.		CO5

Abhishek

PRINCIPAL

College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY

ALL THE BEST



DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES

Shavige Malleshwara Hills, Kumaraswamy Layout, Bangalore-560078.

Max. Marks: 75 Marks

Duration: 03 Hours

Date: 09.05.2024

Time: 1.30 – 4.30 PM

I SESSIONAL EXAM
PB B.Sc. NURSING - I YEAR
COURSE: - MATERNAL NURSING

		Marks	COs
I	LONG ESSAY (ANSWER ANY TWO)	10x2=20	
1.	Legal Framework for the MTP Act.	10	1
2	Describe perioperative nursing care for obstetric conditions.	10	2
3	Explain anatomy of female gynecoid pelvis.	10	1
II	SHORT ESSAY (ANSWER ANY SEVEN)	5X7=35	
4	Planned Parenthood	5	1
5	Incentives for Family Planning	5	1
6	Causes of Maternal Morbidity	5	2
7	Aims of Preconception Care	5	1
8	Purposes of Family Planning	5	1
9	Objectives of Maternity Benefit	5	1
10	Genetic Counseling	5	1
11	Physiological changes during I stage of labour	5	2
12	Discuss management of II stage of labour	5	2
III	SHORT ANSWERS (ANSWER ALL)	2X5=20	
13	Define maternity leave under the Maternity Benefit Act.	2	1
14	Name two contraceptive methods provided under family planning programs.	2	2
15	What is the role of ASHAs in family planning?	2	2
16	Name two major maternal health programs in India.	2	2
17	Give two benefits of breastfeeding.	2	1
18	State two causes of maternal mortality.	2	2
19	Name two genetic disorders.	2	1
20	Define lactation counseling.	2	1
21	Decidua	2	1
22	What is antenatal care?	2	1

Handwritten signature

PRINCIPAL

College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY
Harohalli, Karnataka-562112



DAYANANDA SAGAR UNIVERSITY
SCHOOL OF HEALTH SCIENCES - COLLEGE OF NURSING SCIENCES
 Shavige Malleshwara Hills, Kumaraswamy Layout, Bangalore-560078.

Max. Marks: 75 Marks
 Duration: 03 Hrs

Date: 08.05.2024
 Time: 01:30 PM to 04:30 PM

I SESSIONAL EXAM
I YEAR PB B.SC NURSING
COURSE: -PSYCHOLOGY 16PB105

I	LONG ESSAY: (ANSWER ANY TWO)	10 x 2 =20	CO
	1. Define Motivation. Explain classification of motives.		CO3
	2. What is Perception? Explain principles of perception.		CO2
	3. Define psychology. Explain scope of psychology.		CO1
II	SHORT ESSAY: (ANSWER ANY SEVEN)	5 X 7 = 35	
	4. Enlist and explain types of attention.		CO2
	5. Define intelligence. Explain types of it.		CO3
	6. Brief about Maslow's Hierarchy of needs theory of motivation.		CO2
	7. Discuss about determinants of attention.		CO3
	8. Explain Spearman's G factory theory of intelligence.		CO3
	9. Explain Drive theory of motivation.		CO2
	10. Elaborate about errors in perception.		CO3
	11. Discuss about introspection method of psychology.		CO1
	12. Describe about sensation.		CO2
III	SHORT ANSWERS (ANSWER ALL)	10 X 2 = 20	
	13. Enlist types of hallucination.		CO3
	14. Enlist types of distraction.		CO2
	15. Make a list of methods of psychology.		CO1
	16. What is Illusion?		CO3
	17. Define Extrinsic and Intrinsic Motivation.		CO3
	18. Define Sensation & Distraction.		CO2
	19. What is shifting attention?		CO2
	20. Calculate IQ for below mentioned values: MA= 16, CA=20 IQ=?		CO5
	21. Write the uses of intelligence test.		CO5
	22. Enlist eight major kinds of intelligence given by Gardner's.		CO5

Principal
PRINCIPAL
 College Of Nursing Sciences
 DAYANANDA SAGAR UNIVERSITY
 I,Harohalli, Karnataka-552112
ALL THE BEST



**DAYANANDA SAGAR UNIVERSITY
COLLEGE OF NURSING SCIENCES**

Shavige Malleshwara Hills, Kumaraswamy Layout, Bangalore-560078.

Max. Marks: 75 Marks
Duration: 03 Hours

Date: 09.05.2024
Time: 1.30 – 4.30 PM

**I SESSIONAL EXAM
PB B.Sc. NURSING - 1 YEAR
COURSE: - MATERNAL NURSING**

		Mark s	COs
I	LONG ESSAY (ANSWER ANY TWO)	10x2=20	
1a.	Define antenatal care	2	1
1b.	List the objectives of antenatal care and explain about antenatal care	8	1
2	Discuss physiological changes during pregnancy	10	1
3	Explain anatomy of internal female reproductive organs	10	1
II	SHORT ESSAY (ANSWER ANY SEVEN)	5X7=35	
4	Illustrate fetal circulation with diagram	5	1
5	Structure and functions of placenta	5	1
6	Discuss Menstrual cycle	5	1
7	Explain Fetal Skull	5	3
8	Discuss episiotomy	5	1
9	Explain female pelvis	5	1
10	Discuss minor disorders of pregnancy	5	1
11	Physiological changes during II stage of labour	5	1
12	Discuss management of I stage of labour		
III	SHORT ANSWERS (ANSWER ALL)	2X5=20	
13	Define Labour	2	1
14	Define Fertilization	2	1
15	Define Blastocyst	2	1
16	Define Zygote	2	1
17	Implantation	2	1
18	Fetal membranes	2	1
19	Define polarity	2	1
20	Osiander's sign	2	1
21	Decidua	2	1
22	Hegar's sign	2	1

*CO – Course Outcomes

All the COs listed at the bottom of the page

CO-1	Apply knowledge of physiological changes and management of women in ante, intra, post-partum conditions in the clinical settings.
CO-2	Describe perioperative nursing care for obstetries conditions.
CO-3	Explain the physiology of lactation and advice on management of breast feeding.

Shivani

PRINCIPAL

College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY



DAYANANDA SAGAR UNIVERSITY
SCHOOL OF HEALTH SCIENCES - COLLEGE OF NURSING SCIENCES
Shavige Malleshwara Hills, Kumaraswamy Layout, Bangalore-560078.

Max. Marks: 75 Marks
Duration: 3Hrs.

Date: 15.05.2024
Time: 10.00 am to 11.00 pm

I SESSIONAL EXAM
I YEAR M.SC NURSING
COURSE: - COMMUNITY HEALTH NURSING

I	LONG ESSAY (ANSWER ALL QUESTIONS)	3*20=60	CO
1	a) Discuss in detail about the ethical, legal and socio-cultural issues in community health nursing.	10 M	CO1
	b) Describe the trends and challenges in Community health nursing.	10M	CO1
2	Describe alternative systems for health promotion and management of health problems.	20M	CO2
3	Write IMNCI Module for Anemia and Malnutrition.	20M	CO3
II	SHORT ESSAY (ANSWER ALL QUESTIONS)	03*5=15	
4	Determinants of Health.	5M	CO1
5	SBA Module.	5M	CO3
6	National Population Policy.	5M	CO2

Shivani
PRINCIPAL
College Of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY
Harohalli, Karnataka-562112



DAYANANDA SAGAR UNIVERSITY
SCHOOL OF HEALTH SCIENCES - COLLEGE OF NURSING SCIENCES
Shavige Malleshwara Hills, Kumaraswamy Layout, Bangalore-560078.

Max. Marks: 75 Marks
Duration: 3Hrs.

Date: 28.06.2024
Time: 10.00 am to 01.00 pm

II SESSIONAL EXAM
I YEAR M.SC NURSING
COURSE: - COMMUNITY HEALTH NURSING

I	LONG ESSAY (ANSWER ALL QUESTIONS)	3*20=60	CO
1	a) Discuss in detail about Aims, Objectives, Scope and Role of Nurse in the field of community health nursing. b) Explain Nursing Audit in Community Health Nursing	10M 10M	CO1 CO1
2	Describe Disaster, Types of Disaster, Phases of Disaster and the management of situation during a mass casualty.	20M	CO2
3	Explain Family Health Process, its Components, application of theory concept and Role of the Community Health Nurse in it.	20M	CO2
II	SHORT ESSAY (ANSWER ALL QUESTIONS)	03*5=15	
4	Management Information and Evaluation Systems Application in Nursing	5M	CO1
5	Telenursing Role in Nursing	5M	CO3
6	Records and Reports maintained in the Community Field for better health care.	5M	CO2

Abhishek
PRINCIPAL
School of Nursing, SCS
DAYANANDA SAGAR UNIVERSITY
Harohalli, Karnataka-562112



Date: 30-06-2024
Duration: 3 Hours

Max. Marks: 75 Marks
Time: 10 am – 1pm

SESSIONAL EXAM-II
M.Sc. NURSING- I YEAR
COURSE: OBSTETRICS & GYNAECOLOGICAL NURSING-I

		Marks	COs
I	LONG ESSAY (ANSWER ALL)	20x3=60	
1.	Define infertility, enlist causes of infertility, and explain assisted reproductive techniques	20	2
2a.	Explain physiological changes and management of 1st stage of labour	10	1
2b.	Discuss analgesia and anesthesia in labour	10	1
3a.	Discuss how to identify high risk pregnancy	10	1
3b.	Explain triple test, amniocentesis, chorionic villi sampling	10	1
II	SHORT ESSAY (ANSWER ANY THREE)	5X3=15	
4.	Partograph	5	1
5.	Non Stress Test	5	1
6.	Minor disorder of pregnancy and its management	5	2
7.	Methods of placental separation and delivery	5	1
8.	Role of nurse in infertility management	5	2

*CO – Course Outcomes

All the COs listed at the bottom of the page

CO-1	Apply knowledge of physiological changes and management of women in ante, intra, post-partum conditions in the community and clinical settings.
CO-2	Integrate trends, ethic and professionalism in caring for pregnant women and their family in clinical and community settings.
CO-3	Demonstrate self-confidence, respect and social communication while caring for pregnant women in the clinical and community settings.
CO-4	Incorporate evidence-based nursing practice in the field of Obstetrics and Gynaecology Nursing.

Official
PRINCIPAL



Max. Marks: 75 Marks
Duration: 3 Hours

Date: 29-07-2024
Time: 10am-1pm

SESSIONAL EXAM - I
B.Sc. NURSING - IV YEAR
MIDWIFERY & OBSTETRICAL NURSING

		Marks	COS
I	LONG ESSAY (ANSWER ANY TWO)	10x2=20	
1a.	Define labour	2	CO1
1b.	Explain physiological changes during 1 st stage of labour	8	CO1
2a	Define Puerperium	2	CO1
2b.	Explain physiological changes & management of puerperium	8	CO2
3.	Describe physiology changes & management of 3 rd stage of labour	10	CO2
II	SHORT ESSAY (ANSWER ANY SEVEN)	5X7=35	
4	Explain Fetal circulation with diagram	5	CO1
5	Write Structure & Functions of mature placenta	5	CO1
6	Discuss Legal & ethical aspects in midwifery	5	CO1
7	Describe Menstrual cycle	5	CO1
8	Explain episiotomy	5	CO1
9	Describe mechanism of normal labour	5	CO1
10	Fetal skull	5	CO1
11	Discuss physiology of lactation	5	CO1
12	Characteristics and functions of amniotic fluid	5	CO1
III	SHORT ANSWERS (ANSWER ALL)	2X10=20	
13	Define maternal mortality rate	2	CO1
14	Define fertilization	2	CO1
15	List four pelvic joints	2	CO1
16	Write land marks of pelvic brim	2	CO1
17	List four abnormalities of placenta	2	CO1
18	Implantation	2	CO1
19	Draw a neat diagram of fallopian tube and label it	2	CO1
20	Decidua	2	CO1
21	APGAR score	2	CO1
22	List four causes of onset of labour	2	CO1

*CO – Course Outcomes

All the COs listed at the bottom of the page

CO-1	Apply knowledge of physiological changes and management of women in ante, intra, post partum and gynecological conditions in the clinical settings
CO-2	Describe nursing care for patient with obstetrics and gynecology conditions.
CO-3	Plan suitable nursing care by using problem solving and scientific skills for clients with obstetrics and gynecology conditions in the clinical settings.



Dayananda Sagar
University Bengaluru

COLLEGE OF NURSING SCIENCES
SCHOOL OF HEALTH SCIENCE
Shavige Malleshwara Hills, Kumaraswamy Layout,
Bengaluru-560078.

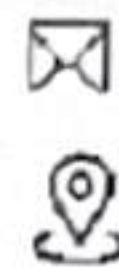
Max. Marks: 75 Marks
Duration: 3 Hours

Date: 30.07.24
Time: 10am-1pm

SESSIONAL EXAM - I
B.Sc. NURSING - IV YEAR
SUB: COMMUNITY HEALTH NURSING-II

		Marks	COS
I	LONG ESSAY (ANSWER ANY TWO)	10x2=20	
1a.	Explain the health problems in India	5	1
1b.	Enumerate the National Health Policies	5	1
2a	Describe the Health Care Delivery Systems	8	1
2b.	List down the Role of Community Health Nurse	2	1
3.	Explain the MCH Services	7	2
3b.	Mention the Functions of PHC	3	2
II	SHORT ESSAY (ANSWER ANY SEVEN)	5X7=35	
4	MTP Act	5	3
5	Occupational Health Safety	5	3
6	Alternative Health Care Systems	5	2
7	School Health Services	5	2
8	Functions of Urban Health Services	5	1
9	Importance of Health Education	5	3
10	Environmental Sanitation	5	3
11	Budgeting of the Health Centre	5	2
12	Child Adaptation Act	5	2
III	SHORT ANSWERS (ANSWER ALL)	2X10=20	
13	Special clinics	2	2
14	Referral Systems	2	2
15	UNICEF	2	1
16	Indian Red Cross Society	2	1
17	Vital Statistics	2	2
18	Principles of Community Health Nursing	2	1
19	Child Abuse	2	1
20	Female Foeticide Act	2	2
21	Planning Commission	2	2
22	Principles of Home Visit	2	2

Principal
PRINCIPAL
College of Nursing Sciences
DAYANANDA SAGAR UNIVERSITY



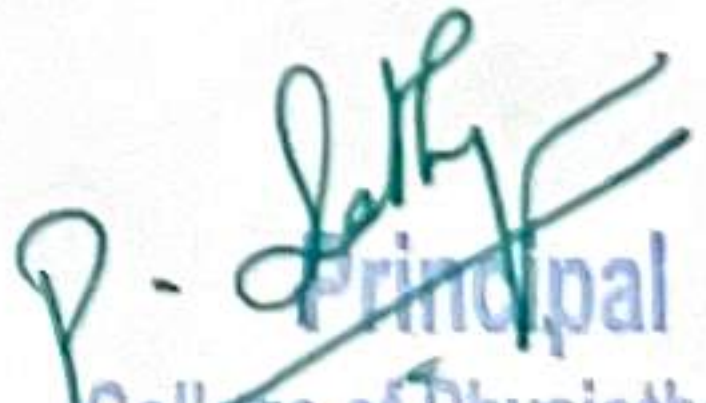
2.6.1 The institution has stated learning outcomes (generic and programme specific)/graduate attributes which are integrated into the assessment process and widely publicized through the website and other documents

The College of Physiotherapy (COPT) is committed to delivering a transformative education that equips students with the knowledge, skills, and professional attitudes required to restore physical function, enhance mobility, and improve the quality of life for individuals of all ages. At COPT, learning outcomes are meticulously designed to align with global standards and regulatory body guidelines, ensuring graduates emerge as competent, compassionate, and forward-thinking professionals in the dynamic healthcare landscape.

COPT emphasizes a robust understanding of human anatomy, physiology, biomechanics, and pathology. The integration of clinical reasoning with theoretical knowledge is a hallmark of the curriculum, fostering the ability to tackle complex health challenges and deliver holistic care.

Practical skills form the backbone of physiotherapy education at COPT. Students gain hands-on experience in manual therapy techniques, therapeutic exercises, and the use of electrotherapy modalities. Advanced technologies, such as gait analysis systems and simulation-based learning environments, are integrated into the training, preparing students to utilize cutting-edge tools in patient care. COPT prioritizes the development of interpersonal skills, enabling students to build trust with patients, collaborate within multidisciplinary teams, and provide effective education on self-care and preventive strategies. By fostering a compassionate attitude, the college instills moral values and prepares students to serve as ethical leaders in healthcare. The importance of evidence-based practice is ingrained in physiotherapy education at COPT. Students are trained to critically appraise scientific literature, integrate the latest research into clinical decision-making, and contribute to the advancement of the profession through their own research endeavors. This approach fosters a culture of lifelong learning, equipping graduates to adapt to emerging trends and innovations in healthcare.

Leadership and teamwork are integral to the learning outcomes at COPT, preparing students to thrive in multidisciplinary healthcare settings. The curriculum also encourages creativity and innovation, enabling physiotherapists to design novel interventions, implement emerging technologies, and address unmet needs in patient care. As advocates for health and well-being, COPT graduates contribute to policy


Principal
College of Physiotherapy,
Dayananda Sagar University,
Bangalore, 560078

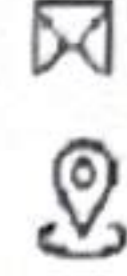


development, manage rehabilitation programs, and drive initiatives that promote accessibility and equity in healthcare.

COPT adheres to rigorous quality assurance processes to ensure the alignment of program education objectives (PEOs), program outcomes (POs), and course outcomes (COs) with global and regulatory standards. Graduate attributes and qualification descriptors are clearly defined and disseminated to stakeholders, enhancing transparency and accountability. Regular updates to the curriculum, informed by feedback from faculty, industry, alumni, and students, ensure that the program remains responsive to evolving healthcare needs.

The College of Physiotherapy is dedicated to nurturing physiotherapists who are not only skilled clinicians but also ethical leaders, innovators, and advocates for public health. By achieving these comprehensive learning outcomes, COPT graduates are poised to transform lives, enhance community well-being, and contribute to the advancement of the global healthcare system.

Principal
College of Physiotherapy,
Dayananda Sagar University,
Bangalore, 560078



USN No:

I, B.P.T Examination – 3rd sessional August 2024

Course Title : HUMAN ANATOMY

Course Code:

Duration:03 Hours

Date:12/08/24

Time: Morning

Max Marks:100

- Note: 1.All Sections are compulsory
2.Draw neat diagrams wherever necessary

SECTION –A

(Long Essay – Answer any Two Questions)

02x10=20

Marks

1.	Describe the shoulder joint under the following headings a) bones forming the joint, b) ligaments, c) movements and muscles responsible for movements, d) applied anatomy	(10 Marks)	CO1	PO1
2.	Describe the hamstring muscles under the following headings? a) origin b) insertion c)action d) nerve supply	(10 Marks)	CO1	PO1
3.	Describe the temporomandibular joint under the following headings a)Bones forming the joint b) ligaments c) movements and muscles responsible for movements d) applied anatomy	(10 Marks)	CO1	PO1

SECTION –B

(Short Essay-Answer any twelve Questions)

12X05=60 Marks

4.	Synovial joint	(05 Marks)	CO1	PO1
5.	Spermatogenesis	(05 Marks)	CO3	PO1
6.	Microscopic structure of transverse section of skeletal muscle	(05 Marks)	CO1,CO2	PO1

P. S. S.

Principal
Principal
College of Physiotherapy,
Dayananda Sagar University,
Bangalore, 560078

7.	Circle of Willis	(05 Marks)	CO1	PO1
8.	Describe the internal features of right atrium.	(05 Marks)	CO1	PO1
9.	Interior of second part of duodenum	(05 Marks)	CO1	PO1
10	Describe the branches of external carotid artery	(05 Marks)	CO1	PO1
11.	Describe the course of facial nerve in the face and mention its branches	(05 Marks)	CO1	PO1
12.	Great saphenous vein	(05 Marks)	CO2	PO2
13.	Ulnar nerve in hand	(05 Marks)	CO2	PO2
14.	Formation and contents of rectus sheath	(05 Marks)	CO1	PO1
15.	Deltoid muscle – attachments and actions	(05 Marks)	CO1	PO1
16.	Supports of uterus	(05 Marks)	CO1	PO1
17.	Name the divisions of trigeminal nerve and describe the course and branches of mandibular nerve	(05 Marks)	CO2	PO2

SECTION –C

(Short Answer –Answer ALL Questions)

10X02=20 Marks

18.	Name any 4 branches of Femoral artery	(02 Marks)	CO1, CO2	PO1, PO2
19.	Name the structures attached to coracoid process	(02 Marks)	CO1	PO1
20.	Name any 4 intracranial dural venous	(02 Marks)	CO1	PO1



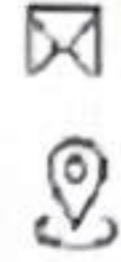
	sinuses	Marks)		
21.	Name four ligaments of liver	(02 Marks)	CO1	PO1
22.	Name the structures passing through foramen magnum	(02 Marks)	CO1	PO1
23.	Foot drop	(02 Marks)	CO4	PO4
PO424.	Epiphysis- name the types	(02 Marks)	CO1	PO1
25.	Name any 4 muscles of Larynx	(02 Marks)	CO1	PO1
26.	Attachments of popliteus muscle	(02 Marks)	CO1	PO1
27.	Name the types of cartilage	(02 Marks)	CO1	PO1





**COLLEGE OF
PHYSIOTHERAPY**

ppl-physio@dsu.edu.in
Deverakagalahalli, Kanakapura Road Ramanagara Dt.
Karnataka - 562 112



USN

No:

I B.P.T Examination – August 2024

Course Title : Kinesiology

Duration:03 Hours

Time: 10.00 AM to 1.00 PM

Course Code:

Date: 12.8.24

Max Marks:100

- Note: 1.All Sections are compulsory
2.Draw neat diagrams wherever necessary

SECTION –A (Long Essay – Answer any Two Questions)		02x10=20 Marks	CO	PO
1.	What is the difference between power grip and precision grip? Describe any two types of Grip.	(10 Marks)	CO3	PO1 PO2, PO3, PO5, PO6
2.	Describe in detail about static and dynamic stability of shoulder.	(10 Marks)	CO1	PO1
3.	Define Posture? Enumerate different types of posture and explain the frontal plane analysis of posture.	(10 Marks)	CO3	PO1 PO2, PO3, PO5, PO6

SECTION –B (Short Essay-Answer any Eight Questions)		12X05=60 Marks	CO	PO
4.	Describe the structure of Intervertebral Disc.	(05 Marks)	CO1	PO1
5.	Lumbo pelvic Rhythm.	(05 Marks)	CO3	PO1 PO2, PO3, PO5, PO6



6.	Screw home mechanism of knee joint.	(05 Marks)	CO2	PO1, PO2, PO3
7.	Explain in brief about kinetics and kinematics with example.	(05 Marks)	CO2	PO1, PO2, PO3
8.	Length tension relationship of a muscle.	(05 Marks)	CO1	PO1
9.	Describe the structure and function of radioulnar joint.	(05 Marks)	CO1	PO1
10.	Structure and function of temporomandibular joint.	(05 Marks)	CO1	PO1
11.	Define lever and explain in detail about II order lever with example in human body.	(05 Marks)	CO1	PO1
12.	Define active and passive insufficiency. Explain any one	(05 Marks)	CO1	PO1
13.	Describe Scapulo humeral rhythm.	(05 Marks)	CO2	PO1, PO2, PO3
14.	Explain determinants of Gait.	(05 Marks)	CO2	PO1, PO2, PO3
15.	Explain Newtons laws of Motion.	(05 Marks)	CO2	PO1, PO2, PO3
16.	Describe Palmar arches.	(05 Marks)	CO1	PO1
17.	Explain synovial joints in detail with neat diagram.	(05 Marks)	CO1	PO1

SECTION -C		10X02=20 Marks	CO	PO
(Short Answer -Answer ALL Questions)				
18.	Carrying angle.	(02 Marks)	CO3	PO1, PO2, PO3, PO5, PO6



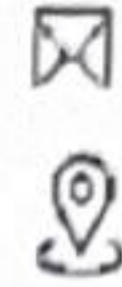
19.	Define COG and LOG.	(02 Marks)	CO2	PO1, PO2, PO3
20.	What is Q angle and its significance.	(02 Marks)	CO2	PO1, PO2, PO3
21.	Mention the phases of Gait cycle.	(02 Marks)	CO2	PO1, PO2, PO3
22.	What is Genu recurvatum?	(02 Marks)	CO3	PO1, PO2, PO5, PO6
23.	What are the movements of first Carpometacarpel joints?	(02 Marks)	CO1	PO1
24.	Mention the uses of Pulleys.	(02 Marks)	CO2	PO1, PO2, PO3
25.	Mention different types of Muscle contraction.	(02 Marks)	CO3	PO1, PO2, PO5, PO6
26.	Spurt and shunt muscle.	(02 Marks)	CO3	PO1, PO2, PO5, PO6
27.	Name the ligaments of Hip Joint.	(02 Marks)	CO1	PO1





**COLLEGE OF
PHYSIOTHERAPY**

ppl-physio@dsu.edu.in
Deverakagalahalli, Kanakapura Road Ramanagaram Dt.
Karnataka - 562 112



No:

USN

I B.P.T Examination – August 2024

Course Title: HUMAN PHYSIOLOGY

Course Code:

Duration:03 Hours

Date:

Time:

Max Marks:100

- Note: 1. All Sections are compulsory
2. Draw neat diagrams wherever necessary

SECTION –A

(Long Essay – Answer any Two Questions)

02x10=20 Marks

1.	Name hormones secreted from anterior pituitary. Discuss the physiological actions of growth hormone. Add a note on effect of hypersecretion of growth hormone in children and adults.	(10 Marks) (3+4+3)	CO1	PO1
2.	Mention the phases of cardiac cycle. With a neat labelled diagram explain changes in left ventricular pressure and volume during cardiac cycle.	(10 Marks) (2+8)	CO1	PO1
3.	Mention the composition and functions of gastric juice. Explain various phases and regulation of gastric secretion.	(10 Marks) (3+4+3)	CO1	PO1

SECTION –B

(Short Essay-Answer any Eight Questions)

12X05=60 Marks

4.	What is artificial kidney? Explain physiological basis and indications.	(05 Marks)	CO1	PO1
5.	With a neat labelled diagram of respiratory membrane, explain the factors affecting diffusion of gases through it.	(05 Marks) (2+3)	CO1	PO1
6.	Define chronaxie, rheobase and utilization	(05 Marks)	CO2	PO1,PO2



	time. Draw neat labelled diagram of strength-duration curve.	(3+2)		
7.	Classify plasma proteins. Mention any 6 functions of plasma proteins.	(05 Marks) (2+3)	CO1	PO1
8.	With a neat labelled diagram, explain normal ECG waves and causes for different waves.	(05 Marks) (2+3)	CO2	PO1, PO2
9.	Explain defecation reflex with diagram.	(05 Marks) (3+2)	CO1	PO1
10	Draw and label visual pathway. Explain effects of lesions at any 2 sites.	(05 Marks) (3+2)	CO1	PO1
11.	Tabulate 6 differences between upper motor neuron and lower motor neuron lesions.	(05 Marks)	CO1	PO1
12.	Mention any 2 causes and 6 clinical features of Cushing's syndrome.	(05 Marks) (2+3)	CO1	PO1
13.	Discuss the circulatory changes occurring during exercise.	(05 Marks)	CO2, CO3	PO1, PO2
14.	Mention the cause and clinical features of myasthenia gravis. Explain the physiological basis of treatment.	(05 Marks) (1+2+2)	CO3	PO1,PO2
15.	Explain tubuloglomerular feedback mechanism.	(05 Marks)	CO1	PO1
16.	Discuss the role of Hypothalamus in temperature regulation.	(05 Marks)	CO1	PO1
17.	Define and classify synapse. Explain any two functions of synapse.	(05 Marks) (1+2+2)	CO1	PO1

SECTION -C

(Short Answer -Answer ALL Questions)

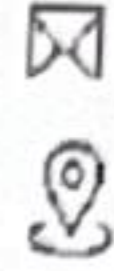
10X02=20 Marks

18.	List hormones of posterior pituitary gland.	(02 Marks)	CO1	PO1
19.	Explain physiological basis for polyuria, polyphagia in diabetes mellitus.	(02 Marks)	CO3	PO1, PO2
20.	Draw and label EEG waves.	(02 Marks)	CO2	PO1, PO2



21.	Define Landsteiner's law.	(02 Marks)	CO1	PO1
22.	Draw and label different lung volumes and capacities.	(02 Marks)	CO2	PO1, PO2
23.	Write 4 functions of liver.	(02 Marks)	CO1	PO1
24.	Discuss applications of cystometrogram.	(02 Marks)	CO3	PO1, PO2
25.	Add a note on facilitated diffusion with 2 examples	(02 Marks)	CO1	PO1
26.	List 4 hormones regulating menstrual cycle.	(02 Marks)	CO1	PO1
27.	Define rigor mortis and mention its cause.	(02 Marks)	CO1	PO1





No:

USN

I B.P.T Examination – August 2024

Course Title : Kinesiology

Duration:03 Hours

Time: 10.00 AM to 1.00 PM

Course Code:

Date: 12.8.24

Max Marks:100

- Note: 1.All Sections are compulsory
2.Draw neat diagrams wherever necessary

SECTION –A (Long Essay – Answer any Two Questions)		02x10=20 Marks	CO	PO
1.	What is the difference between power grip and precision grip? Describe any two types of Grip.	(10 Marks)		
2.	Describe in detail about static and dynamic stability of shoulder.	(10 Marks)		
3.	Define Posture? Enumerate different types of posture and explain the frontal plane analysis of posture.	(10 Marks)		

SECTION –B (Short Essay-Answer any Eight Questions)		12X05=60 Marks	CO	PO
4.	Describe the structure of Intervertebral Disc.	(05 Marks)		
5.	Lumbo pelvic Rhythm.	(05 Marks)		
6.	Screw home mechanism of knee joint.	(05 Marks)		
7.	Explain in brief about kinetics and kinematics with example.	(05 Marks)		
8.	Length tension relationship of a muscle.	(05 Marks)		
9.	Describe the structure and function of radioulnar joint.	(05 Marks)		
10.	Structure and function of temporomandibular joint.	(05 Marks)		
11.	Define lever and explain in detail about II order lever with example in human body.	(05 Marks)		
12.	Define active and passive insufficiency. Explain any one	(05 Marks)		
13.	Describe Scapulo humeral rhythm.	(05 Marks)		
14.	Explain determinants of Gait.	(05 Marks)		



15.	Explain Newtons laws of Motion.	(05 Marks)		
16.	Describe Palmar arches.	(05 Marks)		
17.	Explain synovial joints in detail with neat diagram.	(05 Marks)		

SECTION –C (Short Answer –Answer ALL Questions)		10X02=20 Marks	CO	PO
18.	Carrying angle.	(02 Marks)		
19.	Define COG and LOG.	(02 Marks)		
20.	What is Q angle and its significance.	(02 Marks)		
21.	Mention the phases of Gait cycle.	(02 Marks)		
22.	What is Genu recurvatum?	(02 Marks)		
23.	What are the movements of first Carpometacarpel joints?	(02 Marks)		
24.	Mention the uses of Pulleys.	(02 Marks)		
25.	Mention different types of Muscle contraction.	(02 Marks)		
26.	Spurt and shunt muscle.	(02 Marks)		
27.	Name the ligaments of Hip Joint.	(02 Marks)		

P. Sethy



Principal
College of Physiotherapy,
Dayananda Sagar University,
Bangalore, 560078

SECOND YEAR BPT
FIRST INTERNAL ASSESSMENT – PATHOLOGY

CODE: (22PT201)

Time: 1 Hours

Maximum: 20 marks

LONG ESSAY:



SL NO	QUESTIONS	MARKS	PO	CO
1	Define shock. Mention the types and examples of each. Brief on pathogenesis of hypovolemic shock.	10 (2+4+4)	PO1	CO1

SHORT ESSAY:

SL NO	QUESTIONS	MARKS	PO	CO
2	Differentiate between Marasmus and Kwashiorkor	4	PO1	CO1

SHORT ANSWERS:

SL NO	QUESTIONS	MARKS	PO	CO
3	Types of necrosis with examples	2	PO1	CO1
4	Name 2 viruses and 2 parasites with disease it cause	2	PO1	CO1
5	Types of embolism	2	PO1	CO1

Principal
College of Physiotherapy,
Dayananda Sagar University,
Bangalore, 560078

1ST INTERNALS EXAM 2024 BPT II

ELECTROTHERAPY (22PT205)

MAXIMUM -40 MARKS

LONG ESSAY: (any 1)

SI no	QUESTION	MARKS	PO	CO
1	What is SD Curve? Write a note on the characteristics of SD Curve, uses, advantages and disadvantages.	10	PO1	CO1
2	Enumerate the molecular theory of magnetism. Mention the properties of magnet and add a note on electrotherapy induction.	10	PO1	CO1

SHORT ESSAY: (any 4)

SI no	QUESTION	MARKS	PO	CO
3	Write a note on seddon's classification of nerve injury.	5	PO1	CO1
4	What is a transformer? Add a note on its construction and working.	5	PO1	CO1
5	Write in details about the principles and techniques of medical ionization	5	PO1	CO1
6	Define shock? Mention about the safety precautions and management.	5	PO1	CO1
7	Define static electricity. Mention about the characteristics of lines of forces.	5	PO1	CO1

SHORT ANSWERS:

SI no	QUESTION	MARKS	PO	CO
8	Eddy currents	2	PO1	CO1
9	Chronaxie and Rheobase	2	PO1	CO1
10	Fuse	2	PO1	CO1
11	NMES. Write 2 uses of it.	2	PO1	CO1
12	Ohm's Law	2	PO1	CO1



1ST INTERNALS EXAM 2024 BPT II

MICROBIOLOGY (22PT202)

MAXIMUM -20 MARKS

LONG ESSAY:

SI no	QUESTION	MARKS	PO	CO
1	Define and classify sterilization. Describe the principle and functioning of an autoclave with a neat labelled diagram. Mention the uses of an autoclave in a healthcare setting.	10	PO1	CO1

SHORT ESSAY:

SI no	QUESTION	MARKS	PO	CO
2	Define immunity and Types of Immunity. Write in detail about the innate immunity	4	PO1	CO1

SHORT ANSWERS: (ANY 2)

SI no	QUESTION	MARKS	PO	CO
3	Bacterial spore	3	PO1	CO1
4	Bacterial growth curve	3	PO1	CO1
5	Mention the anaerobic culture methods.	3	PO1	CO1





Dayananda Sagar
University Bengaluru

COLLEGE OF PHYSIOTHERAPY
SCHOOL OF HEALTH SCIENCES
Shavige Malleshwara Hills
Kumaraswamy Layout
Bangalore- 560078

1st Internal Examination January 2024

Marks: 40

Year: II BPT (22PT204)

Date: 29/01/24

Long Essay (Answer any one)		PO	CO
10*01=10			
01	Define active assisted exercises. Explain in detail principles, techniques, effects and uses.	PO1, PO3	CO1, CO2, CO3
02	Define lever and its order in reference with their mechanical disadvantage.	PO1	CO1
Short Essay :			PO1
4*5=20			
01	Explain in detail grades of MMT.	PO1	CO1
02	Define passive movement. Explain principle of passive movements.	PO1, PO3	CO1, CO2, CO3
03	Explain in detail about starting positions.	PO1, PO3	CO1, CO2, CO3
04	Pelvic tilt	PO1	CO1, CO3
Short Answer :			PO1
2*5=10			
01	Jacobson's method	PO1	CO1
02	De Lormes exercise regimens	PO1	CO1
03	Structural properties of skeletal muscle.	PO1	CO1
04	Isokinetic exercises	PO1	CO1
05	Strength and endurance.	PO1, PO3	CO1, CO3





Dayananda Sagar
University Bengaluru

COLLEGE OF PHYSIOTHERAPY
SCHOOL OF HEALTH SCIENCES
Shavige Malleshwara Hills
Kumaraswamy Layout
Bangalore- 560078

1st Internal Examination January 2024

Marks: 20

Year: II BPT (22PT207) bioengineering

Date: 02/02/24

Long Essay (Answer any one)		PO	CO
10*01=10			
01	Define orthosis and prosthesis . explain in detail about the biomechanical principles of orthosis and prosthesis	PO1	CO1
Short Essay		PO1	CO1
5*1=5			
01	Useses of orthosis and prosthesis	PO1	CO1
02	Internal and external force system	PO1	CO1



Pharmacology (22PT203) II Year B.P.T

First Internal Examination Jan 2024

Draw a neat labelled diagram/flowchart wherever necessary

SECTION - A

Long Essay

SL NO	QUESTIONS	MARKS	PO	CO
1	Classify antihypertensive drugs. Discuss the mechanism of action, uses and adverse effects of Enalapril	10	PO1	CO1

SECTION - B

(Short Essay - Answer any FOUR Questions)

04x05=20 Marks

SL NO	QUESTIONS	MARKS	PO	CO
2	Explain the mechanism of action, describe 4 uses and mention 2 adverse effects of heparin	(2+2+1 Marks)	PO1	CO1
3	Define plasma protein binding and discuss the clinical significance of plasma protein binding	(2+3Marks)	PO1	CO1
4	Classify adrenergic agonists based on therapeutic uses.	5	PO1	CO1
5	Describe the mechanism of action of nitrates. Mention 4 uses and 2 adverse effects	(2+2+1 Marks)	PO1	CO1
6	Classify skeletal muscle relaxants. Mention 4 uses and 2 adverse effects of d-tubocurarine	(2+2+1 Marks)	PO1	CO1



SECTION - C

(Short Answer - Answer ALL Questions)

SL NO	QUESTIONS	MARKS	PO	CO
2	Mention types of drug antagonism.	2	P01	C01
3	Mention 4 uses of thiazides	2	P01	C01
4	Mention 4 uses of antiplatelet drugs	2	P01	C01
5	Explain 2 uses of beta blockers	2	P01	C01
6	Mention 2 cholinomimetics along their 2 uses	2	P01	C01



1ST INTERNALS EXAM 2024 BPT II

RESEARCH METHODOLOGY (22PT206)

MAXIMUM -20 MARKS

LONG ESSAY: (any one)

Sl no	QUESTION	MARKS	PO	CO
1	Write comprehensive notes on longitudinal research design. Differentiate longitudinal with cross sectional research design with their	10	PO1	CO1
2	Define Research. Differentiate between Applied Research a Vs fundamental Research as well as qualitative and quantitative research.	10	PO1	CO1

SHORT ESSAY:

Sl no	QUESTION	MARKS	PO	CO
3	Bring out meaning of research. Explain FINER concept of selecting problem.	5	PO1	CO1
4	State the characteristics of SMART objectives.	5	PO1	CO1

P. Sathy



Principal
College of Physiotherapy,
Dayananda Sagar University,
Bangalore, 560078

WhatsApp Presentations - Google Internal Quality Assuranc- AQAR_REPORT_2022_23.p Programme Educational Criterion 2

https://www.dsu.edu.in/physiotherapy/peo-po-pso-co

DAYANANDA SAGAR UNIVERSITY GLC - 2024 Careers Examination News & Events Newsletter Alumni Blog ERP Login e-Brochure International Admissions English

HOME UNIVERSITY ACADEMICS ADMISSIONS INTERNATIONAL RESEARCH INNOVATION PLACEMENT NAAC LIBRARY HOSTEL @ HAROHALLI CONTACT

Home > College of Physiotherapy > PEO, PO, PSO, CO

PEO, PO, PSO, CO

Based on the vision and mission of the College of Physiotherapy- DSU, the Program Educational Objectives (PEOs) that outline the expected achievements of the Physiotherapy program graduates are stated:

- PEO 1: Clinical Excellence and Proficiency
- PEO 2: Leadership, Communication and member of Interdisciplinary care team
- PEO 3: Research and Innovation
- PEO 4: Professional, Ethical and Compassionate Care
- PEO 5: Lifelong Learning and Professional Growth

Program Objectives (POs):

- PO1

PHYSIOTHERAPY

- About Physiotherapy
- Vision, Mission and Goals
- PEO, PO, PSO, CO
- Principal's Message
- Faculty List
- DSU SYMPOSIUM 2024
- Programs Offered
- Syllabus & Scheme
- Seats & Eligibility
- Board of Studies

29°C Haze Search 13:10 23-11-2024

P. Selva

Principal
 College of Physiotherapy,
 Dayananda Sagar University,
 Bangalore, 560078

Browser tabs: [S] WhatsApp, Presentations - Google D..., Internal Quality Assuranc..., AQAR_REPORT_2022_23.t..., Programme Educational C..., Criterion 2

Address bar: <https://www.dsu.edu.in/physiotherapy/peo-po-psy-co>

Navigation: Home, Back, Forward, Refresh, Stop, Print, Full Screen, Search, Star, Bookmarks, Settings, Help

Page Content:

- PSO 5: Pursue lifelong learning and professional development
- PSO 6: Promote community health and wellness

Program Outcomes (POutcomes):

- POutcome 1: Demonstrates Proficiency in Physiotherapy Principles and Techniques
- POutcome 2: Communicates and Collaborates Effectively in Interdisciplinary Settings
- POutcome 3: Engages in Research and Utilizes Evidence-Based Practice
- POutcome 4: Practices Ethical and Compassionate Care
- POutcome 5: Demonstrates Commitment to Lifelong Learning and Professional Development
- POutcome 6: Promotes Community Health and Well-Being

Footer:

- ABOUT**
 - The University
 - Vision & Mission
 - News & Events
 - Research
 - Innovation Labs
- SCHOOLS**
 - School of Engineering
 - School of Computer Applications
 - School of Commerce & Management
 - School of Basic & Applied Sciences
 - School of Health Sciences
- ADMISSIONS**
 - Admissions details
 - DSAT Admissions - Apply Online
 - Direct Admissions - Apply Online
 - Course Eligibility & Fee Structure

DAYANANDA SAGAR UNIVERSITY

DSU Main Campus:
Devarakaggalahalli, Harohalli,
Kanakapura Road, Ramenagara Dt.,

System tray: Breaking news Priyanka Gandhi..., Search, Taskbar icons, Network, ENG IN, 13:10 23-11-2024

P. Jethy
Principal
College of Physiotherapy,
Dayananda Sagar University,
Bangalore, 560078

The screenshot displays a web browser window with the following content:

- Browser Tabs:** (6) WhatsApp, Presentations - Google D..., Internal Quality Assuranc..., AQAR_REPORT_2022_23..., Programme Educational C..., Criterion 2
- Address Bar:** <https://www.dsu.edu.in/physiotherapy/peo-po-psy-co>
- Page Content:**
 - Program Objectives (POs):** PO1, PO2, PO3, PO4, PO5, PO6
 - Program-Specific Objectives (PSOs):**
 - PSO 1: Master foundational physiotherapy principles
 - PSO 2: Exhibit leadership and communication skills
 - PSO 3: Engage in research and evidence-based practice
 - PSO 4: Practice ethical and compassionate care
 - PSO 5: Pursue lifelong learning and professional development
 - PSO 6: Promote community health and wellness
- Navigation Menu (Right Side):**
 - Syllabus & Scheme
 - Seats & Eligibility
 - Board of Studies
 - Programme Educational Objectives
 - Programme Outcomes
 - Library
 - Calendar of Events
 - Opportunities & Careers
 - Research
 - Placements
 - Alumni
 - News and Events
 - Code Of Conduct
 - DSU PHYSIOCON 2023
 - Project Guide list
 - Newsletters
 - Student Council
 - Parents Teacher Meet
- Taskbar (Bottom):** Includes a search bar, system tray with icons for network, volume, and power, and the date/time: 13:10 23-11-2024.

Principal
College of Physiotherapy,
Dayananda Sagar University,
Bangalore, 560078

PEO and Mission Mapping

<u>PEO</u>	<u>PEO Description</u>	<u>Mission: To achieve excellence in education through research and innovation.</u> To enhance professional competencies in Physiotherapy through clinical reasoning, clinical skills and communication. To practice moral, ethical and compassionate care leading towards better health to improve the quality of life.
<u>PEO1: Clinical Excellence and Proficiency</u>	Graduates will demonstrate exceptional clinical skills and knowledge, applying evidence-based practices and innovative techniques to assess, diagnose, and develop effective physiotherapy treatment plans for patients across diverse populations and conditions.	3
<u>PEO2: Leadership and Communication</u>	Graduates will have leadership qualities and effective communication skills, enabling them to work collaboratively within interdisciplinary healthcare teams, advocate for patient-centered care, and effectively communicate with patients, their families, and healthcare professionals.	2*
<u>PEO 3: Research and Innovation</u>	Graduates will engage in research and innovation activities, contributing to the advancement of physiotherapy knowledge, evidence-based practice, and the development of novel approaches to enhance patient care and outcomes.	3
<u>PEO 4: Ethical and Compassionate Care</u>	Graduates will practice moral and ethical conduct, upholding patient confidentiality, respecting cultural diversity, and advocating for patient autonomy while providing compassionate care that considers the holistic well-being of patients, including their physical, emotional, and psychosocial needs.	3
<u>PEO 5: Lifelong Learning and Professional Growth</u>	Graduates will demonstrate a commitment to lifelong learning, engaging in continuous professional development, staying abreast of advancements in the field of physiotherapy, and actively seeking opportunities to improve their skills and knowledge	3
<u>PEO 6: Community Impact and Public Health</u>	Graduates will contribute to community health and wellness through community outreach programs, health education initiatives, and preventive care strategies, making a positive impact on the health and quality of life of the communities they serve.	3

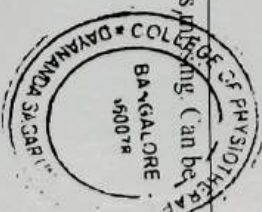
* Only communication aspect is highlighted. Leadership aspect can be added in mission to map accurately with PEO



PEO and Vision Mapping

<u>PEO</u>	<u>PEO Description</u>	<u>Vision</u> : To be a center of excellence in Physiotherapy education, clinical training, research and innovation and to produce professionals with exceptional skills, leadership qualities to serve humanity with compassionate care.
PEO1: Clinical Excellence and Proficiency	Graduates will demonstrate exceptional clinical skills and knowledge, applying evidence-based practices and innovative techniques to assess, diagnose, and develop effective physiotherapy treatment plans for patients across diverse populations and conditions.	3
PEO2: Leadership and Communication	Graduates will have leadership qualities and effective communication skills, enabling them to work collaboratively within interdisciplinary healthcare teams, advocate for patient-centered care, and effectively communicate with patients, their families, and healthcare professionals.	3
PEO 3: Research and Innovation	Graduates will engage in research and innovation activities, contributing to the advancement of physiotherapy knowledge, evidence-based practice, and the development of novel approaches to enhance patient care and outcomes.	3
PEO 4: Ethical and Compassionate Care	Graduates will practice moral and ethical conduct, upholding patient confidentiality, respecting cultural diversity, and advocating for patient autonomy while providing compassionate care that considers the holistic well-being of patients, including their physical, emotional, and psychosocial needs.	3
PEO 5: Lifelong Learning and Professional Growth	Graduates will demonstrate a commitment to lifelong learning, engaging in continuous professional development, staying abreast of advancements in the field of physiotherapy, and actively seeking opportunities to improve their skills and knowledge	2*
PEO 6: Community Impact and Public Health	Graduates will contribute to community health and wellness through community outreach programs, health education initiatives, and preventive care strategies, making a positive impact on the health and quality of life of the communities they serve.	3

* Lifelong learner: Capability to recognize the need, engage self to update knowledge and professional skills – is included in vision by adding enthusiasm to learn after exceptional skills



Program objectives and Vision mapping

<u>PO</u>	<u>PO Description</u>	<u>Vision: To be a center of excellence in Physiotherapy education, clinical training, research and innovation and to produce professionals with exceptional skills, leadership qualities to serve humanity with compassionate care</u>
<u>PO1</u>	Acquire comprehensive knowledge and proficiency in physiotherapy principles, evidence-based practices, and innovative techniques.	3
<u>PO2</u>	Demonstrate leadership qualities, effective communication, and collaborative skills within interdisciplinary healthcare teams.	
<u>PO3</u>	Engage in research activities, contribute to the advancement of physiotherapy knowledge, and utilize evidence-based practices in clinical decision-making.	
<u>PO4</u>	Practice ethical conduct, patient confidentiality, cultural sensitivity, and compassionate care, addressing patients' physical, emotional, and psychosocial needs.	
<u>PO5</u>	Commit to lifelong learning, participate in continuous professional development, and stay updated with the latest advancements in the physiotherapy field.	
<u>PO6</u>	Engage in community outreach programs, health education initiatives, and preventive care strategies to promote community health and well-being.	

* Lifelong learner: Capability to recognize the need, engage self to update knowledge and professional skills – is missing. Can be included in vision by adding enthusiasm to learn after exceptional skills



Program objectives and Mission mapping

<u>PO</u>	<u>PO Description</u>	
<u>PO1</u>	Acquire comprehensive knowledge and proficiency in physiotherapy principles, evidence-based practices, and innovative techniques.	3
<u>PO2</u>	Demonstrate leadership qualities, effective communication, and collaborative skills within interdisciplinary healthcare teams.	3
<u>PO3</u>	Engage in research activities, contribute to the advancement of physiotherapy knowledge, and utilize evidence-based practices in clinical decision-making.	2*
<u>PO4</u>	Practice ethical conduct, patient confidentiality, cultural sensitivity, and compassionate care, addressing patients' physical, emotional, and psychosocial needs.	3
<u>PO5</u>	Commit to lifelong learning, participate in continuous professional development, and stay updated with the latest advancements in the physiotherapy field.	3
<u>PO6</u>	Engage in community outreach programs, health education initiatives, and preventive care strategies to promote community health and well-being.	3

* Only communication aspect is highlighted. Leadership aspect can be added in mission to map accurately with PO



Program specific outcomes and Vision mapping

PO	<u>PO Description</u>	Vision: To be a center of excellence in Physiotherapy education, clinical training, research and innovation and to produce professionals with exceptional skills, leadership qualities to serve humanity with compassionate care
<u>PSO1</u>	Demonstrate a comprehensive understanding of core physiotherapy principles, theories, and evidence-based practices and Achieve proficiency in applying various physiotherapy techniques, including manual therapy, therapeutic exercises, and therapeutic modalities.	3
<u>PSO2</u>	Demonstrate leadership qualities and effective communication within interdisciplinary healthcare teams and Collaborate with healthcare professionals to provide patient-centered care and achieve common treatment goals	3
<u>PSO3</u>	Participate in research projects to contribute to the advancement of physiotherapy knowledge and Utilize evidence-based practices in clinical decision-making to optimize patient outcomes.	3
<u>PSO4</u>	Uphold ethical conduct, patient confidentiality, and cultural sensitivity in all patient interactions and Provide compassionate care, addressing patients' physical, emotional, and psychosocial needs, promoting their overall well-being.	3
<u>PSO5</u>	Demonstrate a commitment to continuous professional growth by engaging in relevant workshops, seminars, and specialized training and Stay updated with the latest advancements in the field through self-directed learning and active participation in professional organizations.	2*
<u>PSO6</u>	Engage in community outreach programs, health education initiatives, and preventive care strategies to positively impact community health and Raise awareness about the benefits of physiotherapy and preventive measures to improve overall community well-being.	3

* Lifelong learner: Capability to recognize the need, engage self to update knowledge and professional skills - organising. Can be included in vision by adding enthusiasm to learn after exceptional skills



Program specific outcomes and Mission mapping

<u>PO</u>	<u>PO Description</u>	<u>Mission: To achieve excellence in education through research and innovation.</u> To enhance professional competencies in Physiotherapy through clinical reasoning, clinical skills and communication. To practice moral, ethical and compassionate care leading towards better health to improve the quality of life.
<u>PSO1</u>	Demonstrate a comprehensive understanding of core physiotherapy principles, theories, and evidence-based practices and Achieve proficiency in applying various physiotherapy techniques, including manual therapy, therapeutic exercises, and therapeutic modalities.	3
<u>PSO2</u>	Demonstrate leadership qualities and effective communication within interdisciplinary healthcare teams and Collaborate with healthcare professionals to provide patient-centered care and achieve common treatment goals	2*
<u>PSO3</u>	Participate in research projects to contribute to the advancement of physiotherapy knowledge and Utilize evidence-based practices in clinical decision-making to optimize patient outcomes.	3
<u>PSO4</u>	Uphold ethical conduct, patient confidentiality, and cultural sensitivity in all patient interactions and Provide compassionate care, addressing patients' physical, emotional, and psychosocial needs, promoting their overall well-being.	3
<u>PSO5</u>	Demonstrate a commitment to continuous professional growth by engaging in relevant workshops, seminars, and specialized training and Stay updated with the latest advancements in the field through self-directed learning and active participation in professional organizations.	3
<u>PSO6</u>	Engage in community outreach programs, health education initiatives, and preventive care strategies to positively impact community health and Raise awareness about the benefits of physiotherapy and preventive measures to improve overall community well-being.	3

* Only communication aspect is highlighted. Leadership aspect can be added in mission to map accurately with PSO



Program outcomes and Vision mapping

<u>PO Outcome</u>	<u>PO Description</u>	<u>Vision</u> : To be a center of excellence in Physiotherapy education, clinical training, research and innovation and to produce professionals with exceptional skills, leadership qualities to serve humanity with compassionate care
<u>PO Outcome1</u>	Exhibit comprehensive knowledge and understanding of physiotherapy principles, evidence-based practices, and innovative techniques and Apply various physiotherapy techniques effectively, including manual therapy, therapeutic exercises, and therapeutic modalities.	3
<u>PO Outcome2</u>	Demonstrate effective leadership qualities and communication skills within interdisciplinary healthcare teams and Collaborate with healthcare professionals to provide patient-centered care, ensuring successful treatment outcomes	3
<u>PO Outcome3</u>	Actively participate in research activities to contribute to the advancement of physiotherapy knowledge and Utilize evidence-based practices in clinical decision-making to optimize patient outcomes and treatment plans.	3
<u>PO Outcome4</u>	Uphold ethical conduct, patient confidentiality, and cultural sensitivity in all patient interactions and healthcare settings and Provide compassionate care, addressing patients' physical, emotional, and psychosocial needs with empathy and understanding.	3
<u>PO Outcome5</u>	Engage in continuous professional development through workshops, seminars, and specialized training and Stay updated with the latest advancements in the field of physiotherapy through self-directed learning and active participation in professional organizations.	2*
<u>PO Outcome6</u>	Actively participate in community outreach programs, health education initiatives, and preventive care strategies to positively impact community health and Raise awareness about the benefits of physiotherapy and preventive measures to improve overall community well-being.	3

* Lifelong learner: Capability to recognize the need, engage self to update knowledge and professional skills – is missing. Can be included in vision by adding enthusiasm to learn after exceptional skills



Program outcomes and Mission mapping

<u>POutcome</u>	<u>PO Description</u>	<u>Mission: To achieve excellence in education through research and innovation.</u> <u>To enhance professional competencies in Physiotherapy through clinical reasoning, clinical skills and communication.</u> <u>To practice moral, ethical and compassionate care leading towards better health to improve the quality of life.</u>
<u>POutcome1</u>	Exhibit comprehensive knowledge and understanding of physiotherapy principles, evidence-based practices, and innovative techniques and Apply various physiotherapy techniques effectively, including manual therapy, therapeutic exercises, and therapeutic modalities.	3
<u>POutcome2</u>	Demonstrate effective leadership qualities and communication skills within interdisciplinary healthcare teams and Collaborate with healthcare professionals to provide patient-centered care, ensuring successful treatment outcomes	2*
<u>POutcome3</u>	Actively participate in research activities to contribute to the advancement of physiotherapy knowledge and Utilize evidence-based practices in clinical decision-making to optimize patient outcomes and treatment plans.	3
<u>POutcome4</u>	Uphold ethical conduct, patient confidentiality, and cultural sensitivity in all patient interactions and healthcare settings and Provide compassionate care, addressing patients' physical, emotional, and psychosocial needs with empathy and understanding.	3
<u>POutcome5</u>	Engage in continuous professional development through workshops, seminars, and specialized training and Stay updated with the latest advancements in the field of physiotherapy through self-directed learning and active participation in professional organizations.	3
<u>POutcome6</u>	Actively participate in community outreach programs, health education initiatives, and preventive care strategies to positively impact community health and Raise awareness about the benefits of physiotherapy and preventive measures to improve overall community well-being.	3

* Only communication aspect is highlighted. Leadership aspect can be added in mission to map accurately with PSO



Suggestions in PEO

1. PEO 6 and PEO 2 can be clubbed "Leadership, communication and member of interdisciplinary care team"
2. Professional term is missing in PEO's. It can be added in PEO4 as Professional, Ethical and Compassionate Care
3. In PEO 1 description Evidence based Practices can be edited as Evidence based Practice
4. In PEO 2 and can be removed after patient centered care

As PSO, PO and POutcomes are as per PEO's no suggestions in these sections except mapping with vision and mission

Mapping is done by following scale

"0" indicates there is no correlation, "1" Slight (Low) Correlation "2" Moderate (Medium) Correlation "3" Substantial (High) Correlation



[Handwritten signature]



COLLEGE OF
PHYSIOTHERAPY

BPT II YEAR (Curriculum 2022-23)

CO-PO Mapping

COURSE	COURSE CODE	P01	P02	P03	P04	P05	P06
PATHOLOGY	22PT201	2	0.6	0.3	0	3	0
MICROBIOLOGY	22PT202	2	0.6	0	0	1	0
PHARMACOLOGY	22PT203	1.5	0.75	0.5	1	0.5	0
EXERCISE THERAPY	22PT204 (Theory) and 22PT271 (Practical)	1	1.75	0.75	0.7	0	0
ELECTROTHERAPY	22PT205 (Theory) and 22PT272 (Practical)	2.6	0	0.5	1	0	0
RESEARCH METHODODOLOGY	22PT206	1	0.75	1.25	1	0	0
BIOENGINEERING: PROGRAM ELECTIVE I	22PT207	1.8	1.8	1.4	1	1	0.4
DIET AND NUTRITION: PROGRAM ELECTIVE II	22PT208	2	0	0	1	1	1



[Handwritten Signature]





**COLLEGE OF
PHYSIOTHERAPY**

YEAR: II YEAR

COURSE CODE: 22PT201

TITLE OF THE COURSE: PATHOLOGY

COURSE OUTCOMES:

CO 1: To be able to understand the causes, symptomatology and investigations of different disorders/diseases.

CO 2: To be able to actively participate in lifelong learning and apply its knowledge in concluding differential diagnosis, final diagnosis, and management in relation to physiotherapy.

CO 3: To collaborate with various health care teams and upskill oneself with the advancements to ensure overall patient care.

Course Outcomes	Programme Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
CO1	3	0	0	0	0	0
CO2	3	0	0	0	1	0
CO3	0	2	1	0	2	0
Average	2	0.6	0.3	0	3	0

P. Selby





**COLLEGE OF
PHYSIOTHERAPY**

YEAR: II YEAR

COURSE CODE: 22PT202

TITLE OF THE COURSE: MICROBIOLOGY

COURSE OUTCOMES:

CO 1: To be able to acquire comprehensive knowledge about the life cycle, modes of transmission and effects of various parasite and its effect on human body.

CO 2: To be able to understand the cause, investigations and related management of different conditions and utilize this knowledge during physiotherapy management.

CO 3: To engage oneself in professional development and communicate with interdisciplinary healthcare to optimize patient treatment and care.

Course Outcomes	Programme Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
CO1	3	0	0	0	0	0
CO2	3	0	0	0	1	0
CO3	0	2	0	0	2	0
Average	2	0.6	0	0	1	0

P. Saty





**COLLEGE OF
PHYSIOTHERAPY**

YEAR: II YEAR

COURSE CODE: 22PT203

TITLE OF THE COURSE: PHARMACOLOGY

COURSE OUTCOMES:

CO 1: To be able to acquire comprehensive knowledge of effects and adverse effects of various drugs on different systems of human body.

CO 2: To be able to understand the limitations imposed by drugs on any therapy applied for patient care.

CO 3: To collaborate with various health care professionals and optimize outcomes assessment and management based on interdisciplinary and comprehensive approach.

CO 4: To comprehend the advancements and utilize evidence based practices during clinical decision making.

Course Outcomes	Programme Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
CO1	3	0	0	0	0	0
CO2	3	0	0	0	0	0
CO3	0	3	0	1	0	0
CO4	0	0	2	3	2	0
Average	c	0.75	0.5	1	0.5	0

P. Sathy





COLLEGE OF PHYSIOTHERAPY

YEAR: II YEAR

COURSE CODE: 22PT204 (Theory) and 22PT271 (Practical)

TITLE OF THE COURSE: EXERCISE THERAPY

COURSE OUTCOMES:

CO 1: To be able to acquire comprehensive knowledge about different types of exercises their principles and techniques.

CO 2: To be able to communicate efficiently about all the principles, techniques and effect of exercises to patients and healthcare professionals.

CO 3: To be able to comprehend all the therapeutic principles and techniques in the restoration of physical function of the patient in health care set up.

CO 4: To comprehend the advancements in therapeutic skills as a therapeutic model for evidence based practices for addressing patients.

Course Outcomes	Programme Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
CO1	3	0	0	0	0	0
CO2	2	3	0	0	0	0
CO3	1	2	0	3	0	0
CO4	0	2	3	2	0	0
Average	1	1.75	0.75	0.7	0	0

P. Sathy





COLLEGE OF PHYSIOTHERAPY

YEAR: II YEAR

COURSE CODE: 22PT205 (Theory) and 22PT272 (Practical)

TITLE OF THE COURSE: ELECTROTHERAPY

Course Outcomes :

CO-1: To be able to describe the basics of electricity and its therapeutic aspects based on the electrotherapy perspective

CO-2: To be able to apply principles and techniques of different electrotherapy modalities in the clinical set up

CO-3: TO be able to demonstrate the effective electrotherapy treatment methods with privacy and precautions

CO-4: To be able to perform appropriate electro-diagnostic tests and interpret the findings prior to the selection of therapeutic currents

CO-5: To comprehend the advancements and utilize evidence based practices during clinical decision making.

CO-6: To document the findings from the patients confidentially

Course Outcomes	Programme Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
CO1	3	0	0	0	0	0
CO2	3	0	0	0	0	0
CO3	3	0	0	3	0	0
CO4	3	0	0	0	0	0
CO5	1	0	3	0	0	0
CO6	3	0	0	3	0	0
Average	2.6	0	0.5	1	0	0

P. Sathy





COLLEGE OF PHYSIOTHERAPY

YEAR: II YEAR

COURSE CODE: 22PT206

TITLE OF THE COURSE: RESEARCH METHODOLOGY

COURSE OUTCOMES:

CO 1: To be able to understand the concepts of research and its application in physiotherapy.

CO 2: To be able to communicate with different disciplines to achieve the successful outcomes in research.

CO 3: To regularly upgrade himself with evidence based practices and learn to contribute towards professional development.

CO 4: To understand the importance of ethical conduct related to research practice throughout his professional life.

Course Outcomes	Program Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
CO1	4	0	0	0	0	0
CO2	0	3	0	0	0	0
CO3	0	0	5	0	0	0
CO4	0	0	0	4	0	0
Average	1	0.75	1.25	1	0	0

P. S. H.





COLLEGE OF PHYSIOTHERAPY

YEAR: II YEAR

COURSE CODE: 22PT207

TITLE OF THE COURSE: BIOENGINEERING : PROGRAM ELECTIVE I

Course Outcomes:

At the completion of the course, students will be able to:

CO1: Understand the historical aspects, materials and instrumentation of common prostheses and orthoses

CO2: Understand the classification and basic principles of working of common prosthetic and orthotic devices

CO3: Understand the role of a Physiotherapist in the process of prescribing and designing of prosthesis, orthosis & assistive devices

CO4: Understand the uses, assessment and prescription of common prosthesis, orthotics and assistive devices.

CO5: Demonstrate various methods of training a patient with prosthesis, orthosis or assistive devices to achieve functional independence.

Course Outcomes	Programme Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
CO1	3	0	0	0	0	0
CO2	2	3	0	0	0	0
CO3	2	2	3	0	0	0
CO4	2	2	3	3	2	0
CO5	0	2	1	2	3	2
Average	1.8	1.8	1.4	1	1	0.4

P. Sathy



**COLLEGE OF
PHYSIOTHERAPY**

YEAR: II YEAR

COURSE CODE: 22PT208

TITLE OF THE COURSE: DIET AND NUTRITION : PROGRAM ELECTIVE II

COURSE OUTCOMES:

At the completion of the course, students will be able to:

- 1) Understand the science of nutrition in daily life and in patient care. Describe the Recommendation of Daily Allowances in India and by WHO.
- 2) Understand the role of a nutrition in overall healing in different disorders based on recent evidences.
- 3) Describe different assessment techniques with advances related to food and nutrition and contribute in awareness at community level.

Course Outcomes	Program Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
CO1	4	0	0	0	0	0
CO2	2	0	0	3	0	0
CO3	0	0	0	0	3	3
Average	2	0	0	1	1	1

P. Sathy





COLLEGE OF PHYSIOTHERAPY

BPT I YEAR (Curriculum 2011-12) Co-PO Mapping

AVERAGE
COURSE
OUTCOME
SCORE

COURSE	COURSE CODE	PO 1	PO2	PO3	PO4	PO5	PO6
HUMAN ANATOMY	22PT101(TH)/ 22PT171(PR)	1.5	0.5	0	0.5	0	0
HUMAN PHYSIOLOGY	22PT102(TH)/ 22PT172(PR)	2	0.75	0	0.75	0	0
BIOCHEMISTRY	22PT103	3	0	0	0	0	0.33
KINESIOLOGY	22PT104(TH)/22PT173(PR)	2.75	0.75	1	0	0.5	0.25
PSYCHOLOGY	22PT105	1.5	0.75	0.5	0.5	0.5	0.5
SOCIOLOGY	22PT106	0.75	0.75	0.5	1	0.75	0.25

P. Lakshmi
PRINCIPAL
College of Physiotherapy,
Dayananda Sagar University,
Bangalore 560 078





COLLEGE OF PHYSIOTHERAPY

YEAR : I YEAR BPT

TITLE OF THE COURSE : HUMAN ANATOMY

COURSE CODE : 22PT101 (Theory). 22PT171 (Practical)

COURSE OUTCOMES

The expected outcomes of this course is that after the prescribed hours of lectures, demonstrations and practical the student will be able to...

CO1: Understand & exhibit comprehensive knowledge of bones, joints, muscles, brain, cardio-pulmonary and nervous systems as needed for the study and practice in physiotherapy.

CO2: Demonstrate the surface anatomy of various structures on the surface of the human body.

CO3: Understand the principles and sequential development of the organs.

CO4: Uphold ethical conduct in applying knowledge of Anatomy in practice of physiotherapy

Course Outcomes	Programme Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
C01	3	0	0	0	0	0
C02	-	2	0	0	0	0
C03	3	0	0	0	0	0
C04	0	0	0	2	0	0
Average	1.5	0.5	0	0.5	0	0

P. Sathy
Head of Department
College of Physiotherapy
Dayananda Sagar University
Bangalore 560 078





COLLEGE OF PHYSIOTHERAPY

YEAR : I YEAR BPT

TITLE OF THE COURSE : HUMAN PHYSIOLOGY

COURSE CODE : 22PT102 (Theory), 22PT172 (Practical)

COURSE OUTCOMES:

The expected outcomes of this course is that after the prescribed hours of lectures, practical and demonstrations the student will be able to...

CO 1: acquire comprehensive knowledge of physiological functions of different organs and organ systems of human body.

CO 2: to demonstrate the different laboratory skills and learn the appropriate solutions in the respective experiments.

CO 3: to practice the correlation of elementary physiology towards the clinical reasoning and provide the compassionate care to the patient.

CO 4: to understand the ethical conduct and develop the practice to follow it throughout the profession.

Course Outcomes	Programme Outcomes					
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
C01	3	0	0	0	0	0
C02	2	1	0	0	0	0
C03	3	2	0	0	0	0
C04	0	0	0	3	0	0
Average	2	0.75	0	0.75	0	0

Principal
College of Physiotherapy,
Dayananda Sagar University,
Bangalore 560 078





COLLEGE OF PHYSIOTHERAPY

YEAR : 1 YEAR BPT

TITLE OF THE COURSE : BIOCHEMISTRY

COURSE CODE : 22PT103

COURSE OUTCOMES

The expected outcomes of this course is that after the prescribed hours of lectures and demonstrations the student will be able to...

CO1: Acquire comprehensive knowledge of the cell organelles with their molecular and functional organization and delineate structure, function and interrelationships of various biomolecules and consequences of deviation from the normal.

CO2: To understand the formation and fate of these biomolecules their normal levels in body fluids required for functioning and their abnormal levels to understand the disease process.

CO3: To understand community prevention measures of digestion and assimilation of nutrients and consequence of malnutrition and explain the biochemical basis of inherited disorders with their associated sequelae.

Course Outcomes	Programme Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
CO1	3	0	0	0	0	0
CO2	3	0	0	0	0	0
CO3	3	0	0	0	0	1
Average	3	0	0	0	0	0.33

[Signature]
PRINCIPAL
College of Physiotherapy
Dayananda Sagar University
Bangalore 560 078





COLLEGE OF PHYSIOTHERAPY

YEAR : I YEAR BPT

TITLE OF THE COURSE : KINESIOLOGY

COURSE CODE : 22PT104

COURSE OUTCOMES

The expected outcomes of this course is that after the prescribed hours of lectures, practical and demonstrations the student will be able to...

CO1: to acquire knowledge on the structure and components of joints and muscles

CO2: to acquire the knowledge on the kinetics and kinematic motions of all the joints

CO3: to analyse and demonstrate the patho-mechanics in the human body

CO4: to understand and analyse the muscle activity in human body during activities of daily living.

Course Outcomes	Programme Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	0	0	0	0
CO2	3	1	1	0	0	0
CO3	3	2	3	0	2	1
CO4	3	0	0	0	0	0
Average	2.75	0.75	1	0	0.5	0.25


PRINCIPAL
College of Physiotherapy,
Dayananda Sagar University
Bangalore 560 078





COLLEGE OF PHYSIOTHERAPY

YEAR : 1 YEAR BPT

TITLE OF THE COURSE : PSYCHOLOGY

COURSE CODE : 22PT105

COURSE OUTCOMES

The expected outcomes of this course is that after the prescribed hours of lectures and demonstrations the student will be able to...

C01: understand the history, scope and method of Psychology.

C02: acquire knowledge on different types of cognitive behaviours and their application in daily life.

C03: provide a patient-centred approach when planning rehabilitation in terms of Motivation, Emotion and impact of stress on behaviour.

C04: engage one-self towards the advances through self-directed learning.

Course Outcomes	Programme Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
C01	3	0	0	0	0	2
C02	3	0	0	0	0	0
C03	0	3	0	2	0	0
C04	0	0	2	0	2	0
Average	1.5	0.75	0.5	0.5	0.5	0.5


PRINCIPAL
College of Physiotherapy
Dayananda Sagar University
Bangalore 560 074





COLLEGE OF PHYSIOTHERAPY

YEAR : I YEAR BPT

TITLE OF THE COURSE : SOCIOLOGY

COURSE CODE : 22PT106

COURSE OUTCOMES

The expected outcomes of this course is that after the prescribed hours of lectures and demonstrations the student will be able to...

CO1: understand the practices that helps sociological engagement and approach towards patient assessment.

CO2: learn the practice of socio-cultural factors and Patient confidentiality in health care settings.

CO3: developing skills for empathy, understanding and motivating participation from patients.

CO4: exhibit the contribution of behaviour in health and sickness and relate it to the therapeutic situations in physiotherapy practices.

Course Outcomes	Programme Outcomes					
	PO 1	PO2	PO3	PO4	PO5	PO6
CO1	3	0	0	0	0	0
CO2	0	0	0	2	0	1
CO3	0	0	0	2	1	0
CO4	0	3	2	0	2	0
Average	0.75	0.75	0.5	1	0.75	0.25

P. Sathy
Head of Department
College of Physiotherapy,
Dayananda Sagar University,
Bangalore 560 078





COLLEGE OF PHYSIOTHERAPY

BPT SYLLABUS

SCHEME OF TEACHING AND EVALUATION

YEAR-I BPT

SL.	COURSE CODE	COURSE TITLE	M/S	NO. OF TEACHING HOURS/WEEK			SCHEME OF EVALUATION						TOTAL	
				D	SP		THEORY			PRACTICAL				
					T	P	W	VV	CA	IA	P	CA		IA
1	22PT101	HUMAN ANATOMY	M	04	-	-	100	30	10	10	--	--	--	150
2	22PT102	HUMAN PHYSIOLOGY	M	04	-	-	100	30	10	10	--	--	--	150
3	22PT103	BIOCHEMISTRY	M	02	-	-	80	--	05	05	--	--	--	
4	22PT104	KINESIOLOGY	M	05	-	-	100	30	10	10	--	--	--	150
5	22PT105	PSYCHOLOGY (SEC- A)	M	02	-	-	40	--	05	05	--	--	--	50
	22PT106	SOCIOLOGY (SEM C-B)	M	02	-	-	40	--	05	05	--	--	--	50
6	22PT171	HUMAN ANATOMY	M	--	1	2	--	--	--	--	40	05	05	50
7	22PT172	HUMAN PHYSIOLOGY	M	--	1	2	--	--	--	--	40	05	05	50
8	22PT173	KINESIOLOGY	M	--	2	2	--	--	--	--	40	05	05	50
TOTAL				19	4	6	420	90	45	45	120	15	15	750



YEAR: I YEAR
 COURSE COD: 22PT101 (Theory) & 22PT171 (Practical)
 TITLE OF THE COURSE: HUMAN ANATOMY

P. Sathy



COLLEGE OF PHYSIOTHERAPY

COURSE OBJECTIVES

The study of anatomy will include identification of all gross anatomical structures. Particular

emphasis will be placed on description of bones, joints, muscles, brain, cardiopulmonary and nervous systems as these are related to the application of patients requiring physiotherapy.

COURSE OUTCOMES

The expected outcomes of this course is that after the prescribed hours of lectures, demonstrations

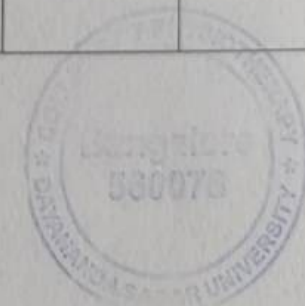
and practical sessions the student will have an in-depth knowledge of human anatomy and will

be able to identify bones, joints, muscles, brain, cardio -pulmonary and nervous systems as

needed for the study and practice in physiotherapy.

COURSE TITLE – Human Anatomy														
COURSE CODE – 22PT101														
Hours				Hours per week				Evaluation pattern						
T h	Pr ac	SP T	Tot al	T h	Pr ac	SP T	Tot al	Theory			Th Aggreg ate	Practica l		Th+P rac
								I A	Writt en exam	V V		I A	Fin al Exa m	
15 0	76	38	264	4	2	1	7	2 0	100	30	150	1 0	40	200

S.I No.	Topic	Theory hours	Practical hours
1.	General Introduction - Must Know <ul style="list-style-type: none"> Histology-Cell, tissues of the body, epithelium, connective tissue, cartilage, bone, lymph, muscle, nerve, skin, bursa, ligaments etc. Osteology- Formation, function, growth and repair of bones, bone classification and types Joints-definition-classification, structure of fibrous, synovial, cartilaginous joints, blood supply and nerve supply of joints. 	15	6





COLLEGE OF PHYSIOTHERAPY

		<ul style="list-style-type: none"> • Muscles – origin, insertion, types, nerve supply and actions • Development of Musculoskeletal system. <p>-Desirable to know</p> <ul style="list-style-type: none"> • Axial skeleton • Differentiation, development of various systems (skin, blood vessels, lymphatic system, fascia) <p>-Nice to know</p> <ul style="list-style-type: none"> • General Embryology- Ovum, spermatozoa, fertilization • Foetal circulation 		
2.	Systems of Human Body	<p>- Must Know</p> <ul style="list-style-type: none"> • Cardiovascular System –Anatomy of heart, Arteries, Capillaries, Veins, lymphatic system • Respiratory System - Anatomy of lungs, upper and lower respiratory tract including nose, larynx, trachea, bronchi, broncho-pulmonary segments, pleura and lungs • Sensory Organs <p>-Desirable to know</p> <ul style="list-style-type: none"> • Urogenital System –Anatomy of Urinary system, Urogenital Diaphragm. <p>-Nice to know</p> <ul style="list-style-type: none"> • Genetics • Digestive System–Anatomy of the gastrointestinal tract. 	15	8
3.	Upper Extremity	<p>- Must Know</p> <ul style="list-style-type: none"> • Outline the anatomical features, attachments, ossification and side determination of the bones of U/L: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges • Joints of upper limb: shoulder girdle, Shoulder joint, Elbow, Wrist and joints of 	24	14





COLLEGE OF PHYSIOTHERAPY

		<p>hand</p> <ul style="list-style-type: none"> • Fascia and Muscles of front and back of upper arm: origin, insertion, nerve supply and action • Muscles of front and back of forearm: origin, insertion, nerve supply and action • Muscles of hand: origin, insertion, nerve supply and action, arches of hand • Nerves of upper Extremity and their position course, relations & distribution • Blood vessels of upper Extremity and their position course, relations, distribution and main branches. Lymphatic drainage of upper Extremity • Surface & Bony landmarks of upper extremity • Demonstration of muscles and movements of Upper extremity joints. • Palpation of peripheral arteries & nerves of upper extremity <p>-Desirable to know</p> <ul style="list-style-type: none"> • Radiographic appearance of Musculoskeletal system of Upper Extremity <p>Nice to know</p> <ul style="list-style-type: none"> • Applied anatomy of all structures of Upper Extremity 		
4.	Thorax	<p>- Must Know</p> <ul style="list-style-type: none"> • Ribs: Parts & main features of typical rib & define true, false and floating ribs • Sternum: parts and anatomical features • Thoracic vertebrae: parts and anatomical features • Mediastinum – divisions and contents • Pericardium and Conduction system of heart • Joints of Thorax- Identify & explain in detail various joints: • Manubrio-sternal joint, Costo-Chondral 	14	6





COLLEGE OF PHYSIOTHERAPY

		<p>joints, Chondro- sternal joints</p> <ul style="list-style-type: none"> • Costo-vertebral joints, Costo-transverse joints • Intervertebral joints • Movements of vertebral column & Rib cage. • Intercostal space and its content and accessory muscles of respiration • Diaphragm- origin, insertion, structures passing through it. • Mention the course and branches of nerves, blood vessels and lymphatic drainage of thorax. <p>-Desirable to know</p> <ul style="list-style-type: none"> • Surface anatomy and radio-graphical appearance of structures of thorax <p>-Nice to know</p> <ul style="list-style-type: none"> • Applied anatomy of thorax 		
5.	Head, Face and Neck	<p>- Must Know</p> <ul style="list-style-type: none"> • Bones of skull and mandible • Muscles & Vessels and nerve supply of neck • Facial muscles and its nerve supply and blood supply • Temporo-Mandibular (TM) joint, Cervical vertebrae & Skull. • Movement of TM joint <p>-Desirable to know</p> <ul style="list-style-type: none"> • Triangles of neck • Larynx, Pharynx • Gross anatomy and muscles of eyes, ears and tongue • Blood and nerve supply of eyes and ears • Salivary glands • Lateral wall of nose • Position, shape, size, function, blood supply and nerve supply of: Hypothalamus and 	14	0





COLLEGE OF PHYSIOTHERAPY

		<p>pituitary glands, pineal glands, thyroid glands, parathyroid glands, thymus.</p> <p>-Nice to know Surface and radiographic appearance of Head, Neck and Face.</p> <ul style="list-style-type: none"> • Applied anatomy of Head, Neck and Face. 		
06.	Neuro anatomy	<p>- Must Know</p> <ul style="list-style-type: none"> • Central Nervous System • Peripheral Nervous System • Cranial nerves • Peripheral Nerves • Neuromuscular Junction • Sensory End Organs • Spinal Cord Segments & Areas • Brainstem • Cerebellum • Inferior colliculi & Superior colliculi • Thalamus • Corpus striatum • Cerebral hemispheres • Basal Ganglia • Internal Capsule • Thalamo-cortical radiations • Pyramidal systems & Extra-pyramidal systems • Sympathetic & Para-sympathetic system • Ventricles system • Meninges • Pons, medulla • Blood supply of the brain <p>-Desirable to know</p> <ul style="list-style-type: none"> • Epithalamus • Rhinencephalon • Diencephalon • Visual radiation • Auditory radiation • Neural tube • Position, shape, size, function, blood supply 	18	8





COLLEGE OF PHYSIOTHERAPY

		and nerve supply of the following glands: Hypothalamus, pituitary gland.		
7.	Trunk and Abdomen	<p>- Must Know</p> <ul style="list-style-type: none">• Vertebral columns: Identify parts of typical (and atypical) vertebra and state the main features, attachments and ossification.• Intervertebral disc and mention its part. <p>Myology-</p> <ul style="list-style-type: none">• Fascia and muscles of back / para vertebral muscles.• Fascia and muscles of post Abdominal Wall: origin, insertion, nerve supply and action.• Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum.• Fascia and muscles connecting U/L with vertebral column: origin, insertion, nerve supply, action. <p>-Desirable to know</p> <ul style="list-style-type: none">• Surface Anatomy of all vertebrae• Mention the course and branches of nerves, blood vessels and also lymphatic drainage of trunk & abdomen.• Lumbar Plexus: Position, formation and branches.• Rectus sheath: formation and contents.• Contents of vertebral canal and abdomen• Large blood vessels of the gut: Location, size, shape, features, blood supply, nerve supply and functions of the following: Stomach, liver spleen, pancreas, kidney, urinary bladder, intestines, gall bladder.• Radiographic appearance of vertebrae• Position, shape, size, function, blood supply and nerve supply of the following glands: Adrenal glands, pancreatic islets. <p>-Nice to know</p>	16	8





COLLEGE OF PHYSIOTHERAPY

		<ul style="list-style-type: none"> Applied Anatomy of structures of trunk & abdomen. 		
8.	Pelvis	<p>- Must Know</p> <ul style="list-style-type: none"> Features of pubic symphysis and sacroiliac joints. Muscles of pelvic floor, their attachments, action Nerve supply, Lymphatic drainage and Blood vessels of the region with course, variations, distribution and main branches <p>-Desirable to know</p> <ul style="list-style-type: none"> Demonstration of movements of pelvis Sacral Plexus Main features of subdivision, boundaries, walls & floor of pelvis. Difference between male and female pelvis. Anatomy, Blood and nerve supply and difference between male and female reproductive system. Position, shape, size, function, blood supply and nerve supply of the following glands: ovaries and testes. <p>-Nice to know</p> <ul style="list-style-type: none"> Applied anatomy of lumbar plexus 	10	6
9.	Lower Extremity	<p>- Must Know</p> <ul style="list-style-type: none"> Osteology - Hip bone, femur, Tibia, Fibula, Patella, and bones of the foot Myology- Origin, Insertion, Nerve Supply, Action of the following: <ul style="list-style-type: none"> Fascia and muscles in anterior of thigh Fascia and muscles of medial side of thigh Fascia and muscles of posterior of thigh Fascia and muscles of gluteal region Fascia and muscles of lateral side of leg Fascia and muscles of back of leg and sole of foot Arches and skin of foot Detailed explanation of joints of Lower 	24	14





COLLEGE OF PHYSIOTHERAPY

		<p>extremity: Hip, joint, Knee joint, Ankle joint, joints of foot.</p> <ul style="list-style-type: none">• Surface & Bony landmarks of lower extremity• Demonstration of muscles and movements of lower extremity joints.• Identification and palpation the nerves of Lower extremity and mention their position course, relations and distribution• Indication and palpation the blood vessels of Lower extremity and mention their position, course, relation, distribution and main branches• Explain femoral triangle, femoral canal, inguinal canal and adductor canal and subsartorial canal• Poptileal fossa <p>-Desirable to know</p> <ul style="list-style-type: none">• Radiographic appearance of musculoskeletal system of Lower extremity• Lymphatic drainage of Lower extremity <p>-Nice to know</p> <ul style="list-style-type: none">• Applied Anatomy of structures of Lower extremity		
10.	SPT		38	

Recommended Textbooks:

1. B.D Chaurasia's Human Anatomy – Regional And Applied; Volume I, Volume II and Volume III.





COLLEGE OF PHYSIOTHERAPY

2. SINGH [Inderbir], Textbook of Anatomy with colour atlas: Introduction, Osteology, Upper Extremity, Lower Extremity. Vol I. JP Brothers, New Delhi 1996.
3. SINGH [Inderbir], Textbook of Anatomy with colour Atlas: Thorax and Abdomen. Vol II. JP Brothers, New Delhi 1996.
4. SINGH [Inderbir], Textbook of Anatomy with colour Atlas: Head and Neck Central Nervous System. Vol III. JP Brothers, New Delhi 1996.
5. SINGH [Inderbir], Human Osteology. JP Brothers, New Delhi 1990.

Reference Books:

1. SNELL [Richards], Clinical Anatomy for Medical students: Ed.5. Little Brown and Company, Boston. 1995.
2. MOORIE [KiethL], Clinically Oriented Anatomy. Ed.3., Williams and Wilkins, Baltimore, 1992
3. DATTA [A.K], Essentials of human Anatomy: Thorax and Abdomen Ed.2. Vol. I Current Book International, Calcutta 1994
4. DATTA [A.K], Essentials of human Anatomy: Head and Neck Ed2. Vol. II, Current Book International, Calcutta 1995

YEAR : I YEAR
COURSE CODE : 22PT102 (Theory)
22PT171 (Practical)
TITLE OF THE COURSE : HUMAN PHYSIOLOGY

COURSE OBJECTIVES





COLLEGE OF PHYSIOTHERAPY

This course helps the student to understand the basis of normal human physiology with special emphasis on the functioning of the cardiovascular, musculoskeletal, nervous system and respiratory system.

COURSE OUTCOMES

The expected outcomes of this course is that after the prescribed hours of lectures, demonstrations, and lab and practical the student will be able to demonstrate an understanding of elementary human physiology.

COURSE TITLE – Human Physiology														
COURSE CODE – 22PT102														
Hours				Hours per week				Evaluation pattern						
T h	Pr ac	SP T	Tot al	T h	Pr ac	SP T	Tot al	Theory			Th Aggreg ate	Practica l		Th+P rac
								I A	Writt en exam	V V		I A	Fin al Exa m	
15 0	76	38	264	4	2	1	7	2 0	100	30	150	1 0	40	200

S.I No.	Topic		Theory hours	Practical hours
1.	General Physiology	<p>- Must Know</p> <ul style="list-style-type: none"> • Cells & its organelles – structure & functions • Homeostasis, biofeedback mechanisms • Transport across cell membrane • Outline of membrane potential & action potential <p>-Desirable to know</p> <ul style="list-style-type: none"> • Body fluids: Distribution, composition. Tissue fluid – formation. 	8	-
2.	Nerve Muscle Physiology	<p>- Must Know</p> <ul style="list-style-type: none"> • Muscle- classification, structure, sarcomere & its properties • Myoneural junction & transmission 	14	6





COLLEGE OF PHYSIOTHERAPY

		<ul style="list-style-type: none"> • Molecular basis of muscle contraction • Motor unit, EMG • Nerve - Structure, Properties & Classification of nerves • Propagation of nerve impulse, Resting membrane potential. Action potential – ionic basis and properties. • Degeneration and regeneration of nerve • Neuromuscular junction – Structure • Neuromuscular transmission <p>-Desirable to know</p> <ul style="list-style-type: none"> • Applied aspects – Myasthenia Gravis, Rigor mortis • Length – Tension Relationship, Strength-Duration Curve • Reaction of degeneration • Muscle disorders <p>-Nice to know</p> <ul style="list-style-type: none"> • Fatigue • Load • Plasticity 		
3.	Haematology	<p>- Must Know</p> <ul style="list-style-type: none"> • Composition and functions of blood • Red blood cell – morphology, formation, normal count, functions, physiological and pathological variation. • White blood cell- morphology, classification, properties, functions, physiological & pathological variation • Haemoglobin– basic chemistry, fate and functions. • Immunity- definition, classification, concept of antigen & antibody • Haemostasis– steps, role of platelets • Blood groups – A, B,O,AB and Rh system, Landsteiner's Law • Anaemia, ESR & PCV 	14	6





COLLEGE OF PHYSIOTHERAPY

		<ul style="list-style-type: none"> • Lymph: Composition, formation, circulations and functions <p>-Desirable to know</p> <ul style="list-style-type: none"> • Plasma proteins • Blood coagulation factors, Anticoagulants • Blood transfusion <p>-Nice to know</p> <ul style="list-style-type: none"> • Haemophilia • Thrombocytopenia • Edema 		
4.	Cardiovascular System	<p>- Must Know</p> <ul style="list-style-type: none"> • Physiological anatomy and nerve supply of the heart and blood vessels. Organization of CVS. • General organization and properties of cardiac muscle • Origin and conduction of cardiac impulse • Cardiac cycle and heart sounds • Normal heart rate, bradycardia, tachycardia, normal ECG • Cardiac output- normal values, physiological variations, factors affecting cardiac output and regulation • Blood pressure- normal values, measurement, determinants, short term and long term regulation • Pressure and volume changes during cardiac cycle • Regional circulation- Coronary, Muscular, Cerebral • Shock – Definition, Classification – causes and features. <p>-Desirable to know</p> <ul style="list-style-type: none"> • Pathophysiology of circulatory shock and oedema • Hypertension, hypotension <p>-Nice to know</p> <ul style="list-style-type: none"> • Cardiovascular changes during exercise. 	14	6





COLLEGE OF PHYSIOTHERAPY

5.	Respiratory System	<p>- Must Know</p> <ul style="list-style-type: none"> • General organization of respiratory system • Nerve supply and Functions of respiratory system • Mechanics of respiration- inspiratory & expiratory muscles, intrapleural pressure, lung & thoracic compliance, surfactant, lung volumes & capacities • Diffusion of gases • Transport of respiratory gases • Regulation of respiration • Outline of hypoxia- types & physiological changes • Acclimatization to high altitude. • Dead space, Ventilation/ perfusion ratio • Maximum breathing capacity & breathing reserve • Pulmonary function tests. <p>-Desirable to know</p> <ul style="list-style-type: none"> • Artificial respiration • Chest Expansion <p>-Nice to know</p> <ul style="list-style-type: none"> • Asphyxia, cyanosis (types and physiological changes) • Respiratory changes during exercise. 	14	6
6.	Digestive System	<p>- Must Know</p> <ul style="list-style-type: none"> • Physiological anatomy and nerve supply of alimentary canal. Enteric nervous system • General organization • Mastication and deglutition • Saliva – composition, functions & regulation of salivary secretion • Gastric secretion – composition, mechanism, phases of secretion, • Regulation and functions. • Outline of gastric emptying and peristalsis • Pancreatic secretion - composition, regulation & functions • Liver and Gallbladder – composition and 	12	6





COLLEGE OF PHYSIOTHERAPY

		<p>functions of bile</p> <ul style="list-style-type: none"> • Movements and functions of small and large intestine • Defecation reflex <p>-Desirable to know</p> <ul style="list-style-type: none"> • Jaundice • Peptic ulcer • Constipation, diarrhoea 		
7.	Renal Physiology	<p>- Must Know</p> <ul style="list-style-type: none"> • General introduction, structure and functions of kidney • Formation of urine- filtration, re-absorption and secretion, GFR – normal value and factors affecting • Physiology of micturition • Neurogenic bladder <p>-Desirable to know</p> <ul style="list-style-type: none"> • Renal circulation • Creatinine Clearance • Plasma clearance test • Acid-Base Balance <p>-Nice to know</p> <ul style="list-style-type: none"> • Artificial kidney – Principle of haemodialysis 	10	6
8.	Body Temperature Regulation	<p>- Must Know</p> <ul style="list-style-type: none"> • Normal body temperature & its regulation • Skin-structure and functions <p>-Desirable to know</p> <ul style="list-style-type: none"> • Hypothermia, hyperthermia 	6	6
9.	Endocrine System	<p>- Must Know</p> <ul style="list-style-type: none"> • Introduction - General organization of endocrine glands • Mechanism of hormone action • Releasing hormones from hypothalamus • Physiological actions, regulation & disorders of: 	12	6





COLLEGE OF PHYSIOTHERAPY

		<p>Anterior & Posterior pituitary hormones Thyroid & Parathyroid Hormones Adrenal cortex & medulla Pancreatic hormones</p> <p>-Desirable to know Local Hormones.</p> <p>-Nice to know</p> <ul style="list-style-type: none"> • Disorders: Gigantism, Acromegaly, Dwarfism, Diabetes insipidus. • Disorders: Myxedema, Cretinism, Grave's disease • Disorder: Diabetes mellitus. • Calcitriol, Thymus and Pineal gland. • Disorders: Addison's disease, Cushing's syndrome, Conn's syndrome, Adrenogenital syndrome. 		
10.	Reproductive System	<p>- Must Know</p> <ul style="list-style-type: none"> • Functional anatomy of reproductive system • Puberty, changes in males and females, menarche, menopause • Spermatogenesis - stages and regulation, Physiological actions of testosterone, Semen • Menstrual cycle & Ovarian cycles – phases & hormonal regulation, ovulation • Physiology of pregnancy • Lactation – initiation, maintenance and control, • Functions of placenta <p>-Desirable to know</p> <ul style="list-style-type: none"> • Sex determination, Sex differentiation • Pregnancy tests • Contraception methods <p>-Nice to know</p> <ul style="list-style-type: none"> • Sex chromosomes • precocious and delayed puberty 	12	-





COLLEGE OF PHYSIOTHERAPY

11.	Central Nervous System	<p>- Must Know</p> <ul style="list-style-type: none"> • General organization of nervous system • Receptors – definition, classification and functions • Synapse-definition, physiological anatomy & synaptic transmission • Reflexes – classification, properties and functions • Spinal cord- ascending & descending tract and functions • Ascending tracts-sensations carried, pathways & functions • Descending tract - Origin, course & termination & functions • Pain sensation – types of pain, pathways for pain, referred pain, central analgesia system • Posture & equilibrium, Vestibular apparatus • Thalamus & Hypothalamus – its functions • Cerebellum – functions, effects of lesion • Basal ganglia – functions, effects of lesion, Parkinsonism • Muscle tone • Cerebral cortex – Gross anatomy, division & functions of each lobe • Autonomic nervous system – Organization & functions of parasympathetic & sympathetic system and functions • CSF – Composition, formation, circulation, functions & Blood brain barrier, Applied aspects • Differences between Upper Motor Neuron and Lower Motor Neuron lesions <p>-Desirable to know</p> <ul style="list-style-type: none"> • Synthesis of neurotransmitters • Limbic system and its functions <p>-Nice to know</p> <ul style="list-style-type: none"> • Effects of spinal transection 	18	6
-----	------------------------	---	----	---





COLLEGE OF PHYSIOTHERAPY

		<ul style="list-style-type: none"> • Decerebrate and decorticate rigidity • Thalamic syndrome • Ascending and descending reticular activating system • Speech, memory and learning 		
12.	Special Senses	<p><i>Vision</i></p> <p>Must Know</p> <ul style="list-style-type: none"> • Vision – Structure of Eye ball, retina, refractory errors • Accommodation, visual pathway, Pupillary reflexes <p>Desirable to know</p> <ul style="list-style-type: none"> • Light and dark adaptation • Photochemistry of vision 	16	6
		<p><i>Ear</i></p> <p>Must Know</p> <ul style="list-style-type: none"> • Functional anatomy of Ear, Cochlea • Functions of middle & inner ear <p>Desirable to know</p> <ul style="list-style-type: none"> • Auditory pathway • Audiometry <p>Nice to know</p> <ul style="list-style-type: none"> • Physics of sound • Theories of hearing 		
		<p><i>Taste & smell</i></p> <p>Must Know</p> <ul style="list-style-type: none"> • Functional anatomy • Factors affecting taste and smell 		
13.	Practical & Lecture demonstrations (L.Ds)	<p>a) Clinical examination of arterial pulse.</p> <p>b) Determination of arterial blood pressure.</p> <p>c) Clinical examination of the cardiovascular system.</p> <p>d) Clinical examination of the respiratory system.</p> <p>e) Clinical examination of higher mental functions.</p> <p>f) Clinical examination of the sensory system.</p> <p>g) Clinical examination of motor system –I.</p>	-	22





COLLEGE OF PHYSIOTHERAPY

		h) Clinical examination of motor system –II i) Clinical examination of all cranial nerves.		
14.	SPT		38	

Recommended Textbooks:

1. Textbook of medical physiology – Guyton Arthur
2. Concise medical physiology – Chaudhuri Sujit K.
3. Human Physiology – Chatterjee C.C.
4. Textbook of practical Physiology – Ranade.
5. Text of Physiology – A.K.Jain.
6. Basics of Medical physiology- Venkatesh D & Sudhakar H H
7. Manipal Manual of Physiology – Prof. C N Chandrashekar

Reference Books:

1. Review of Medical Physiology – Ganong William F.
2. Physiological basis of Medical practice – Best & Taylo





COLLEGE OF PHYSIOTHERAPY

YEAR : I YEAR
COURSE CODE : 22PT103
TITLE OF THE COURSE : BIOCHEMISTRY

COURSE OBJECTIVES

This course provides the knowledge and skills in fundamental organic chemistry and introductory biochemistry that are essential for further studies. It covers basic biochemical, cellular, biological and microbiological processes, basic chemical reactions in the prokaryotic and eukaryotic cells, the structure of biological molecules, introduction to the nutrients i.e. carbohydrates, fats, enzymes, nucleic acids and amino acids.

COURSE OUTCOMES

The student would know:

1. Various bio-molecules which are present in the body and functions
2. The formation and fate of these bio-molecules
3. Their normal levels in body fluids required for functioning and their abnormal levels to understand the disease process.

Hours		Evaluation pattern		
Tot	Lec	Written		Total
		IA	Final Exam	Final Exam
60	60	20	80	100

Unit I

S.I No.	Topic		Theory hours
1.	Nutrition	- Must Know <ul style="list-style-type: none">• Introduction, Importance of nutrition Calorific values, Respiratory quotient – Definition, and its	7





COLLEGE OF PHYSIOTHERAPY

		<p>significance</p> <ul style="list-style-type: none"> • Energy requirement of a person - Basal metabolic rate: Definition, Normal values, factor affecting BMR Special dynamic action of food • Physical activities - Energy expenditure for various activities. Calculation of energy requirement of a person <p>-Desirable to know</p> <ul style="list-style-type: none"> • Balanced diet Recommended dietary allowances • Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers Role of lipids in diet <p>-Nice to know</p> <ul style="list-style-type: none"> • Role of proteins in diet: Quality of proteins - Biological value, net protein utilization, Nutritional aspects of proteins-essential and non-essential amino acids. • Nitrogen balance Nutritional disorders 	
2.	Carbohydrate Chemistry	<p>- Must Know</p> <ul style="list-style-type: none"> • Definition, general classification with examples, Glycosidic bond • Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Polysaccharides. 	3
3.	Lipid Chemistry	<p>- Must Know</p> <ul style="list-style-type: none"> • Definition, general classification Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol <p>-Nice to know</p> <ul style="list-style-type: none"> • Essential fatty acids and their importance Lipoproteins: Definition, classification, properties, Sources and function Ketone bodies 	3
4.	Amino-acid Chemistry	<p>-Desirable to know</p> <ul style="list-style-type: none"> • Amino acid chemistry: Definition, Classification, 	3





COLLEGE OF PHYSIOTHERAPY

		<ul style="list-style-type: none"> Disorders of digestion and absorption – Lactose intolerance. 	
3.	Carbohydrate Metabolism	<p>- Must Know</p> <ul style="list-style-type: none"> Introduction, Glycolysis – Aerobic, Anaerobic Citric acid cycle, Substrate level phosphorylation <p>-Desirable to know</p> <ul style="list-style-type: none"> Glycogen metabolism – Glycogenesis, Glycogenolysis, Metabolic disorders glycogen, Gluconeogenesis, Cori cycle <p>-Nice to know</p> <ul style="list-style-type: none"> Hormonal regulation of glucose, Glycosuria, Diabetes mellitus. 	5
4.	Lipid Metabolism	<p>- Must Know</p> <ul style="list-style-type: none"> Introduction to lipid metabolism, Lipolysis, Oxidation of fatty acids -oxidation of fatty acids, Lipogenesis - Denovo synthesis of fatty acids, chain elongation, desaturation, triacylglycerol synthesis, fat metabolism in adipose tissues Ketone body metabolism: Ketone body formation (ketogenesis), utilization (ketolysis), ketosis, Rothera's test <p>-Desirable to know</p> <ul style="list-style-type: none"> Cholesterol metabolism: synthesis, degradation, cholesterol transport Hypercholesterolemia and its effects (atherosclerosis and coronary heart diseases) 	5
5.	Amino acid and Protein Metabolism	<p>- Must Know</p> <ul style="list-style-type: none"> Catabolism of amino acids - Introduction, transamination, deamination, Fate of ammonia, transport of ammonia, Urea cycle <p>-Desirable to know</p> <ul style="list-style-type: none"> Specialized products formed from amino acids - from glycine, arginine, methionine, phenylalanine and tyrosine. 	3





COLLEGE OF PHYSIOTHERAPY

		Peptide bonds Peptides: Definition, Biologically important peptides Protein chemistry: Definition, Classification, Functions of proteins.	
5.	Enzymes	<p>- Must Know</p> <ul style="list-style-type: none"> • Definition, Active site, Cofactor (Coenzyme, Activator), Proenzyme. <p>-Nice to know</p> <ul style="list-style-type: none"> • Classification with examples, Factors affecting enzyme activity, Enzyme inhibition and significance, Isoenzymes, Diagnostic enzymology (clinical significance of enzymes) 	3

Unit II

S.I No.	Topic		Theory hours
1.	Nucleotide and Nucleic acid Chemistry	<p>- Must Know</p> <ul style="list-style-type: none"> • Nucleotide chemistry: Nucleotide composition, functions of free nucleotides in body. <p>-Desirable to know</p> <ul style="list-style-type: none"> • Nucleic acid (DNA and RNA) chemistry: Difference between DNA and RNA, Structure of DNA (Watson and Crick model), Functions of DNA. <p>-Nice to know</p> <ul style="list-style-type: none"> • Structure and functions of tRNA, rRNA, mRNA. 	2
2.	Digestion and Absorption	<p>- Must Know</p> <ul style="list-style-type: none"> • General characteristics of digestion and absorption, Digestion and absorption of carbohydrates, proteins and lipids. <p>-Desirable to know</p>	3





COLLEGE OF PHYSIOTHERAPY

Reference Books:

1. LEHNINGER [Albert] et.al., Principles of Biochemistry, Ed. 3, LBS Publishers, Delhi, 1993
2. ORTEN [James M] and NEUHAUS [OHO.W]. Human Biochemistry, Ed. 9, Mosby, St.Louis, 1975
3. Strayer [LUBERT], Biochemistry, Ed. 4, WH, Freeman & Co., Ny.1995
4. DEVLIN [Thomas M], Biochemistry with Clinical Correalation, Ed. 4, Willey Libs, NY 1997

YEAR

1 YEAR





COLLEGE OF PHYSIOTHERAPY

6	Vitamins	<p>-Must Know</p> <ul style="list-style-type: none"> • Definition, classification according to solubility. <p>-Desirable to know</p> <ul style="list-style-type: none"> • Individual vitamins - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency and toxicity 	7
---	----------	---	---

Unit III

S.I No.	Topic		Theory hours
1.	Mineral Metabolism	<p>-Desirable to know</p> <ul style="list-style-type: none"> • Definition, Sources, RDA, Digestion, absorption, transport, excretion, functions, disorder of Individual minerals - Calcium, phosphate, iron, Magnesium, fluoride, selenium, molybdenum, copper. Phosphate, calcium and iron in detail 	2
2.	Cell Biology	<p>- Must Know</p> <ul style="list-style-type: none"> • Introduction, Cell structure, Cell membrane structure and function, various types of absorption. • Intracellular organelles and their functions, briefly on cytoskeleton 	2
3.	Muscle Contraction	<p>- Must Know</p> <ul style="list-style-type: none"> • Contractile elements in muscle, briefly on the process of muscle contraction, Energy for muscle contraction 	2
4.	Biochemistry of Connective tissue	<p>- Must Know</p> <ul style="list-style-type: none"> • Introduction, various connective tissue proteins: Collagen, elastin - Structure and associated disorders. Glycoproteins, Proteoglycans 	2
5.	Hormone Action	<p>- Desirable to know</p> <ul style="list-style-type: none"> • Definition, classification, Mechanism of hormone action. Receptors, signal transduction, second messengers and cell function 	2





COLLEGE OF PHYSIOTHERAPY

COURSE CODE : 22PT104
(Theory)

22PT173

(Practical)

TITLE OF THE COURSE :
KINESIOLOGY

COURSE OBJECTIVES

This course supplements the knowledge of anatomy and enables the students to have a better understanding of the principles of biomechanics and their applications in musculoskeletal function and dysfunction.

COURSE OUTCOMES

The expected outcomes of this course is that after the prescribed hours of lectures and demonstrations in addition to clinical the student will be able to demonstrate an understanding of the principles of bio-mechanics and kinesiology and their application in health and disease.

COURSE TITLE – Kinesiology														
COURSE CODE – 22PT104														
Hours				Hours per week				Evaluation pattern						
T h	Pr ac	SP T	Tot al	T h	Pr ac	SP T	Tot al	Theory			Th Aggreg ate	Practica l		Th+P rac
								I A	Writt en exam	V V		I A	Fin al Exa m	
15 2	38	38	228	4	1	1	6	2 0	100	30	150	1 0	40	200

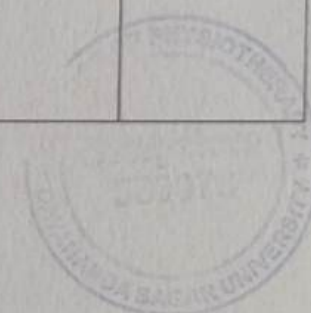
COURSE CONTENTS			
Topic	Kinesiology	Hours of teaching learning	
		Theory	Practical
UNIT - I			
1	Section 1- Basic concepts of Biomechanics	12	1
	Must Know <ul style="list-style-type: none"> Review of mechanics, including motion, forces, force systems, composition of forces, Force of Gravity, Reaction forces, Equilibrium, Objects in Motion, Force of friction, Concurrent force systems, Parallel force systems Introduction to Biomechanics and terminology 		





COLLEGE OF PHYSIOTHERAPY

	<ul style="list-style-type: none"> • Lower Limb: Hip complex, knee, ankle and foot • Vertebral Column: Cervical, Thoracic, thoracic cage, Lumbar and Sacroiliac spine 		
	Nice to know <ul style="list-style-type: none"> • Pathomechanics of the joints 		
UNIT - II			
5	Section- V Goniometry	6	3
	Must Know <ul style="list-style-type: none"> • Parts, types, principles and uses of a goniometry. 		
	Desirable to know <ul style="list-style-type: none"> • Techniques for measurement of ROM of all peripheral joints 		
	Nice to know <ul style="list-style-type: none"> • Techniques for measurement of spine ROM 		
6	Section- VI Biomechanics of Thorax and Chest Wall	4	1
	Must Know <ul style="list-style-type: none"> • General structure and function Rib cage movements -Kinetics and Kinematics • The muscles associated with the rib cage 		
7	Section-VII – Biomechanics of Vertebral Column	15	2
	Must Know <ul style="list-style-type: none"> • General structure and function • Regional structure and function – Cervical region, thoracic region, lumbar region, sacral region • Muscles of the vertebral column • Ligaments of Vertebral Column 		
	Nice to know <ul style="list-style-type: none"> • Pathomechanics of the vertebral column 		





COLLEGE OF PHYSIOTHERAPY

	<ul style="list-style-type: none"> • Axis & planes with movements occurring at each joint • Levers, Pulleys, Moment Arm and Force • Newton's law of motion • Center of Gravity, Line of gravity, Stability and Equilibrium 		
2	Section – II - Muscle Structure and function	8	2
	Must Know <ul style="list-style-type: none"> • Composition, unit, structure, architecture of muscle Classification of Muscles • Functions of muscles & factors affecting it • Group action of muscle 		
	Nice to know- <ul style="list-style-type: none"> • Effect of immobilization, injury & aging on muscle 		
3	Section – III - Joint structure and function	10	2
	Must Know <ul style="list-style-type: none"> • Basic principles of Joint design and a human joint • Tissues present in human joint including fibrous tissue, bone, cartilage and connective tissue • Bio-physical properties of connective tissue [contractile & non-contractile], Elasticity /Plasticity- response to sudden/slow/ sustained loading - Stress strain Curve, Creep, Hysteresis • Classification of joints 		
	Desirable to Know <ul style="list-style-type: none"> • Effect of immobilization, injury & aging on joint 		
4	Section – IV Anatomy and Biomechanics of the joints	70	15
	Must Know <ul style="list-style-type: none"> • Upper limb: Shoulder girdle, elbow, wrist and hand 		





COLLEGE OF PHYSIOTHERAPY

	Acid-Base balance	- Must Know <ul style="list-style-type: none"> • Acids, bases and buffers, pH. Buffer systems of the body, bicarbonate buffer system Role of lungs and kidneys in acid base balance, Acid base imbalance 	2
	Water balance	Nice to know <ul style="list-style-type: none"> • Water distribution in the body, Body water, water turnover, Regulation of water balance: role of ADH and thirst centre. 	1
	Electrolyte balance	Nice to know <ul style="list-style-type: none"> • Osmolarity. Distribution of electrolytes Electrolyte balance: Role of aldosterone, rennin angiotensin system and ANF 	1
	Clinical Biochemistry	Must Know <ul style="list-style-type: none"> • Normal levels of blood and urine constituents, Relevance of blood and urine levels of Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH and Bicarbonate. Desirable to know <ul style="list-style-type: none"> • Liver function tests, Renal function tests 	2
			60

Recommended Textbooks:

1. MURRAY [ROBERT KK], Harper's Bio Chemistry Ed 24, Prentice Hall. 1996, p925
RAMAKRISHNA [S], PRASANNA [KG], RAJAN [R], Text Book of Medical Biochemistry, Ed 1, orient Langman, Bombay 1980.
2. VASUDEVAN [DM] and SREE KUMARI [S], Text Book of Bio Chemistry for Medical students, Ed 1, Jaypee Brothers, New Delhi, 1995
3. DAS [Debajyothi], Biochemistry, Ed. 7, Academic Publishers Calcutta, 1992
4. PRASAD RM, RM's Physiotherapy Textbook Series, Textbook of Biochemistry for Bachelor of Physiotherapy First Edition, RM Publications, Mangalore.





COLLEGE OF PHYSIOTHERAPY

8	Section VIII- Temporomandible Joint	3	1
	Must Know <ul style="list-style-type: none"> • General features • structure and function 		
UNIT - III			
9	Section IX- Analysis of Posture	8	3
	Must Know <ul style="list-style-type: none"> • Static and dynamic posture, • postural control, • kinetics and kinematics of posture • Ideal posture analysis of posture 		
10	Section X- Analysis of Gait	8	4
	Must Know <ul style="list-style-type: none"> • General features of gait, • Gait initiation, kinematics and kinetics of gait, energy requirements. • kinematics and kinetics of gait 		
	Desirable to know <ul style="list-style-type: none"> • Energy requirements • Kinematics and kinetics of the trunk and upper extremities in relation to gait, stair case climbing and running 		
	Nice to know <ul style="list-style-type: none"> • Pathomechanics of abnormal gait patterns 		
11	Section XI -Movement Analysis	3	2
	Must Know <ul style="list-style-type: none"> • Kinetics & Kinematics of various activities of daily living like supine to sitting, sitting to standing, walking and climbing up & down 		
	Nice to know <ul style="list-style-type: none"> • Kinetics & Kinematics of running, jogging, pulling, pushing 		





COLLEGE OF PHYSIOTHERAPY

	<ul style="list-style-type: none">• Kinetics & Kinematics of lifting, overhead activities, squatting		
12	Section XII- Walking aids Must Know	5	2
	<ul style="list-style-type: none">• Parallel bars, crutches, canes, walkers, etc. - types, parts and uses.		
13	SPT	38	

Recommended Textbooks :

1. Joint Structure and Function – A comprehensive Analysis, JP Bros Medical Publishers, New Delhi.
2. Brunnstrom, Clinical Kinesiology, JP Bros Medical Publishers, Bangalore, 5th Ed 1996, 1st Indian Ed 1998
3. Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore, 1st Indian Ed 1997





COLLEGE OF PHYSIOTHERAPY

YEAR : I YEAR
 COURSE CODE : 22PT105
 TITLE OF THE COURSE : PSYCHOLOGY

COURSE OBJECTIVES

This course will enable the student to understand specific psychological factors and effects in physical illness and thus help them to have a holistic approach in their dealings with patients during admission, rehabilitation and discharge.

COURSE OUTCOMES

The expected outcomes of this course is that after completion of lectures and demonstrations the students will be able to recognize and help with the psychological factors involved in disability, pain, disfigurement, unconscious patients, chronic illness, death, bereavement and medical-surgical patient/condition.

Hours		Evaluation pattern		Total
Tot	Lec	Written	Final Exam	Final Exam
60	60	10	40	50

Topic S/No	Course content	Hours of teaching/learning
		Theory
	Unit I	
	Must Know :	5
1	Introduction to Psychology · Definition and nature of Psychology, Fields & subfields of psychology · Schools of thoughts- Structuralism, functionalism, Behaviorism, Gestalt, Psycho-analytic Theory	5
2	Developmental Psychology · Definition & its Theories · Physiological & Psychological changes during Infancy, Early & Late childhood, adolescent stage, Puberty, Adulthood & old age	6
3	Emotions- nature & relationship with autonomic nervous system · Theories of emotions - James Lange theory, Schachter Singer theory, Cannon Bard theory	6
	Desireable to know	





COLLEGE OF PHYSIOTHERAPY

4	Attention & perception: Nature of attention & perception, Principle of grouping	2
5	Stress: Physiological and Psychological relation to health and sickness, Psychosomatic, Professional stress burnout	2
6	Psychological Reactions of a Patient: during admission and treatment anxiety, shock, denial, suspicion, questioning, loneliness, regression, shame, guilt, rejection, fear, withdrawal, depression, egocentricity, concern about small matters, narrowed interests, emotional overreactions, perpetual changes, confusion, disorientation, hallucinations, delusions, illusions, anger, hostility, loss of hope	2
Unit II		
Must Know :		
7	Motivation- Maslow's hierarchy of motives, Theories of motivation, Motivation cycle Conflict & Frustration – Types of conflicts, Common Defense mechanism, stress	6
8	Intelligence : Theories, Distribution and Assessment	6
9	Thinking: Reasoning, Problem Solving, Creative Thinking	4
Desirable to know		
10	Reactions to Loss: death and bereavement shock and disbelief, development of awareness, restitution, resolution, stages of acceptance as proposed by Kubler – Ross	2
Unit III		
Must Know		
11	Learning - Definition and theories, conditioning, Role of learning in human life Memory- Definition and nature, types of memory and forgetting cause Learning	8
12	Personality: Approaches to personality, Personality assessment and Defense Mechanisms. Abnormal Psychology - Difference between normal & Abnormal, Causes of abnormality	4
13	Social psychology: Leadership: Different types of leaders. Different theoretical approaches to leadership.	4
Desirable to know		
14	Behavior Modifications: Application of various conditioning and learning	2





COLLEGE OF PHYSIOTHERAPY

	principles to modify patient behaviours	
	Nice to know	
15	Compliance: Nature, factors contributing to non-compliance, improving compliance	2

Recommended Textbooks:

1. Feldman.R.H (1996). Understanding Psychology. New Delhi: Tata Mc Grawhill.
2. Morgan et al. (2003). Introduction to Psychology. New Delhi: Tata Mc Grawhill.
3. Leftn. Psychology. Boston: Alwin & BacotCompany.
4. Mangal, S.K(2002). Advanced Educational Psychology. New Delhi
5. Atkinson (1996). Dictionary of Psychology.





COLLEGE OF PHYSIOTHERAPY

YEAR : I YEAR
COURSE CODE : 22PT106
TITLE OF THE COURSE : SOCIOLOGY

COURSE OBJECTIVES:

This course introduces students to sociological perspectives on health, illness, and medicine. It explores the social, political, cultural, and economic forces that shape contemporary medicine and experiences of health. Using a range of theoretical approaches, the course will examine topics related to the illness experience, health inequalities, biomedical knowledge and practices, and the impact of medical technologies.

COURSE OUTCOME:

- Students will develop and demonstrate a critical understanding of different sociological perspectives.
- Students will apply a critical sociological perspective to examine key concepts and approaches in public health, showing their awareness of issues regarding the production and distribution of power and knowledge.
- They will learn to link individual experiences of health and illness with social figurations and the social construction of normality.

Hours		Evaluation pattern		
Tot	Lec	Written		Total
		IA	Final Exam	Final Exam
60	60	10	40	50
Topic Sr No	Course content	Hours of teaching/ learning Theory		
	Unit I			
	Mus t Kno w :			
1	Intro ducti	8		





COLLEGE OF PHYSIOTHERAPY

	on - Defi nitio n & Rele vanc e with Phys iothe rapy.	
2	Soci olog y & Heal th -Soc ial facto rs affec ting Heal th Statu s, Soci al Cons ciou snes & Perc eptio n of Illne ss, Deci sion Mak ing in takin g Trea	4





COLLEGE OF PHYSIOTHERAPY

	temen t	
3	Soci aliza tion - Defi nitio n, Influ ence of Soci al Fact ors, on Pers onali ty, Soci aliza tion in the Hos pital &Re hABIL itatio n of the patie nts.	6
4	Soci al grou ps- Con cepts Influ ence of	4



COLLEGE OF PHYSIOTHERAPY

	formal & informal groups of Health & Diseases.	
	Unit II	
	Must Know :	
5	Family-Influence on human personality, Individual Health, Family & Nutrition, Effects of Sickness on Family Psyc	4





COLLEGE OF PHYSIOTHERAPY

	hosomatic Diseases & Family	
6	Community Role - in Rural & Urban communities in Public Health, in determining Beliefs, Practices & Home Remedies in Treatment.	6
7	Social prob	6





COLLEGE OF PHYSIOTHERAPY

8	Soci al Secu rity & Soci al Legi slati on in relati on to the Disa bled	4
	Desi reab le to kno w	
9	Role of Prim ary & Seco ndar y Grou ps in the Hos pital & Reha bilita tion Setti ng	3
	Unit III	
10	Cult ure- Com	3



COLLEGE OF PHYSIOTHERAPY

blems of the Disa bled- Cons eque nces of the follo wing socia l prob lems in relati on to sick ness disa bilit y, reme dies to prev ent these prob lems . Popu latio n Expl osio n Pove rty & Une mplo yme nt	
---	--





COLLEGE OF PHYSIOTHERAPY

	ponents Impact on Human Behaviour Cultural Meaning of Sickness, Response to Sickness & Choice of Treatment	
11	Cast e Systems- Features of Modern Cast Systems & its Trends, Social chan	4





COLLEGE OF PHYSIOTHERAPY

	ge facto rs-H uma n Ada ptati on, Stres s, Devi ance , Heal th Prog ram, Role of Soci al Plan ning in the impr ove ment of Heal th & in Reha bilita tion	
12	Soci al Cont rol - Defi nitio n, Role of nor	3





COLLEGE OF PHYSIOTHERAPY

	ms, Folk ways , Cust oms, Mor als, Reli gion, Law & other mea ns of socia l contr ols in the regul ation of Hum an Beha vior, Soci al Devi ance & Dise ase	
13	Prost ituti on, Alco holis m, Beg gary, Prob	3





COLLEGE OF PHYSIOTHERAPY

	blems of Women in Employment, Role of a Social Worker.	
	Nice to Know	
14	Role of Culture as Social consciousness in moulding the Perception of Reality, Culture induced Symptoms & Dise	2





COLLEGE OF PHYSIOTHERAPY

	ases, Sub- Cult ure of Med ical Wor kers	
--	--	--

Recommended Textbooks:

1. Sachdeva and Vidyabushan, Introduction to the study of sociology.
2. INDRANI T K, Text Books of Sociology for Graduates Nurses and Physiotherapy Students, JP Brothers, New Delhi, 10 edition. and Health Disorders

P. Satby



BPT YEAR-III

SL.NO.	COURSE CODE	COURSE TITLE	M/E	NO. OF TEACHING HOURS			SCHEME OF EVALUATION						TOTAL	
				D	CL	P	THEORY				PRACTICAL			
							W	VV	CA	IA	P	CA		IA
1	22PT301	GENERAL MEDICINE	M	02	--	--	80	--	10	10	--	--	--	100
2	22PT302	GENERAL SURGERY	M	02	--	--	80	--	10	10	--	--	--	100
3	22PT303	ORTHOPEDIC & TRAUMATOLOGY	M	02	--	--	80	--	10	10	--	--	--	100
4	22PT304	ORTHOPEDICS & SPORTS PHYSIOTHERAPY	M	02	--	--	100	30	10	10	--	--	--	150
5	22PT305	CARDIO-RESPIRATORY & GENERAL PHYSIOTHERAPY	M	02	--	--	100	30	10	10	--	--	--	150
6	22PT371	ORTHOPEDICS & SPORTS PHYSIOTHERAPY - PRACTICAL	M	--	01	01	--	--	--	--	40	05	05	50
7	22PT372	CARDIO-RESPIRATORY & GENERAL PHYSIOTHERAPY - PRACTICAL	M	--	01	01	--	--	--	--	40	05	05	50
8	22PT373	CLINICAL TRAINING	M	--	18	--	--	--	--	--	--	--	--	--
GRAND TOTAL				10	20	02	440	60	50	50	80	10	10	700
TOTAL NUMBER OF HOURS/WEEK				32	--	--	--	--	--	--	--	--	--	--

Note: M- Main Course, D - Didactic, CL - Clinical, P - Practical, W - Written, VV - Viva Voce, CA - Continuous Assessment, IA - Internal Assessment

Changes made:

1. Course codes are revised (highlighted in color blue).



P. Sathy

YEAR : BPT III YEAR

COURSE CODE : 22PT301

TITLE OF THE COURSE : GENERAL MEDICINE

COURSE OBJECTIVES

THIS COURSE INTENDS TO FAMILIARIZE STUDENTS WITH MEDICAL TERMINOLOGY & ABBREVIATIONS FOR EFFICIENT & EFFECTIVE CHART REVIEWING & DOCUMENTATION. IT ALSO EXPLORES SELECTED SYSTEMIC DISEASES, FOCUSING ON EPIDEMIOLOGY, PATHOLOGY, HISTOLOGY, ETIOLOGY AS WELL AS PRIMARY & SECONDARY CLINICAL CHARACTERISTICS & THEIR MANAGEMENT. DISCUSSES & INTEGRATES SUBSEQUENT MEDICAL MANAGEMENT OF GENERAL, RHEUMATOLOGY, GERONTOLOGY, CARDIO- VASCULAR & RESPIRATORY SYSTEMS, TO FORMULATE APPROPRIATE INTERVENTION, INDICATIONS, PRECAUTIONS & CONTRAINDICATIONS.

COURSE OUTCOMES:

- **CO 1-** Gain a comprehensive understanding of the causes, manifestations, and management of conditions relevant to physiotherapy through lectures and demonstrations.
- **CO 2-** Develop insight into the etiology, pathology, and symptomatic presentation of various ailments, along with their associated functional impairments.
- **CO 3-** Acquire the ability to assess limitations imposed by diseases on therapeutic interventions, aiding in the formulation of effective treatment plans.
- **CO 4-** Cultivate a nuanced understanding of how physiological dysfunctions impact therapeutic outcomes, fostering informed and empathetic patient care practices.

COURSE TITLE –GENERAL MEDICINE													
COURSE CODE –22PT301													
Hours				Hours per week				Evaluation pattern					
Theor y	Practica l	Supervise d practical training	Tota l	T h	Pra c	SPT	Tota l	Written	Total	Practical	Total		
								IA	Final Exa m	Final Exa m	I A	Final Exa m	Final Exa m
60	-	-	60	2	-	-		20	20	-	-	-	-

GENERAL MEDICINE I

S.I No.	Topic	Hours of teaching/learning
1.	- Must to know	3 Hours



	Infection:	<ul style="list-style-type: none"> • Effects of infection on the body – Pathology – source and spread of infection- Pyrexia of unknown origin, bacterial: streptococcal, staphylococcal, thyroid shigella, cholera, leprosy, enteric gram negatives, meningitis, encephalitis • – vaccinations – generalized infections – rashes and infection – food poisoning and gastroenteritis – sexually transmitted diseases – HIV infections and Aids, Gonorrhoea, syphilis, chlamydia • Polio • Clostridial infection, tetanus, gas gangrene • Covid 19, Rabies • Protozoal, Malaria, amoebiasis, filaria 	
2.	Poisoning :	<p>- Must to know</p> <ul style="list-style-type: none"> • Clinical features – general management – common agents in poisoning – pharmaceutical agents – drugs of misuse – chemical pesticides –Envenomation • Snake and Scorpion bite 	2 Hours
3.	Endocrine diseases:	<p>- Must to know</p> <ul style="list-style-type: none"> • Common presenting symptoms of Endocrine disease – common classical disease presentations, clinical features and its management; • Diabetes Mellitus : Etiology and pathogenesis of diabetes- clinical manifestation of the disease- management of the disease – complication of diabetes • Thyroid disorders, GH Disorders, DI, Calcium homeostasis – PTH, Vitamin D3, Calcitonin's • Adrenal glands disorders Cushing's, Addison's, Conns 	4 Hours
4.	Diseases of the blood :	<p>- Must to know</p> <ul style="list-style-type: none"> • Examinations of blood disorders – Clinical manifestations of blood disease Anaemia – signs and symptoms – types and management, Haemophilia, VWB Disease, platelet disorders, DIC, Leukaemia's, 	4 Hours



lymphomas, multiple myeloma.

GENERAL MEDICINE II

S.I No.	Topic	Theory hours
1.	<p>Diseases of the digestive system</p> <p>- Must to know</p> <ul style="list-style-type: none"> • Clinical manifestations of gastrointestinal disease – Aetiology, clinical features, diagnosis, complications and treatment of the following conditions : Reflux Oesophagitis, Ulcerative Colitis, Peptic Ulcer disease, Achalasia Cardia, Carcinoma of Oesophagus, GI bleeding, Carcinoma of Stomach, Pancreatitis, Malabsorption Syndrome, Peritonitis, Infections of Alimentary Tract ; • Diarrhoea, constipation, irritable bowel syndrome. • Clinical manifestations of liver diseases - Aetiology, clinical features, diagnosis, complications and treatment of the following conditions : Viral Hepatitis, Wilson's Disease, Alpha- antitrypsin deficiency, Tumours of the Liver, Gall stones, Cholecystitis • Alcoholic Liver Disease 	7 Hours
2.	<p>Cardiovascular Disease :</p> <p>- Must to know</p> <ul style="list-style-type: none"> • Examination of the Cardiovascular System – Investigations : ECG, Exercise Stress Testing, Radiology ; Clinical manifestations of Cardiovascular disease ; Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases and disorders of the heart : Pericarditis, Myocarditis, Endocarditis, Rheumatic Fever – resulting in valve disorders, Ischemic Heart Disease, Coronary Valve Disease, Congenital disorders of the Heart, Cardiac Arrest ; Examination and Investigations of diseases of arteries and veins 	8 Hours

		<ul style="list-style-type: none"> • ; Hypertension: Definition, causes, classification, types, assessment, investigations and management. • Hyperlipidaemia, myocardial ischemia, MI, Cardiomyopathy, congenital heart disease, Aortic disease: Dissection, Coarctation of aorta, vascular disorder: Atherosclerosis, thromboangitis obliterans 	
3.	Respiratory Disease	<p>- Must to know</p> <ul style="list-style-type: none"> • Examination of the Respiratory System – Investigations : Chest Radiographs, Pulmonary Function Testing, Arterial Blood Gas Analysis ; • Clinical manifestations of Lung disease ;Patterns of lung disease – Chronic Obstructive Lung Disease and Restrictive Lung Disease ; • Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following lung diseases : Asthma, Pneumonia, Tuberculosis <p>-Desirable to know</p> <ul style="list-style-type: none"> • Chronic Bronchitis, Emphysema, Bronchiectasis, Cystic Fibrosis, Upper Respiratory Tract Infections, , Fungal Diseases, Interstitial Lung Diseases, Diseases of the pleura, diaphragm and chest wall ; • Respiratory failure – Definition, types, causes, clinical features, diagnosis and management. 	9 Hours

GENERAL MEDICINE III

S.I No.	Topic	Theory hours
1.	Diseases of the Skin: -Must to know Examination and clinical manifestations of skin diseases ; Causes, clinical features and management of the following skin conditions : Leprosy, Psoriasis, Pigmentary Anomalies, Vasomotor disorders, Dermatitis, Coccal and Fungal Parasitic and Viral infections.	6 Hours
2.	Psychiatric - Nice to know	5 Hours



Disorders:	<ul style="list-style-type: none">• Depression, mood Disorders, OCD, Anxiety, Personality disorders, Alcohol, Sleep disorders: Insomnia, hypersomnia
-------------------	--

Recommended books:

1. Davidson's Principles and Practice of Medicine
2. Harrison's Internal Medicine
3. Braunwald Text of Cardiology
4. Text Book of Cardiology by Hurst

Question Paper pattern for University Exams –

Long Essay Answers (Answer any 2 out of 3):	2 × 10 = 20 marks
Short Essay Answers (Answer any 8 out of 10):	8 × 5 = 40 marks
Short Answers (Answer all 10 questions):	10 × 2 = 20 marks

Changes made:

1. New Topic/Content is added to curriculum in discussion with respective subject expert (highlighted in color blue).
2. Question paper pattern is added.
3. No. of teaching/learning hours are revised.



COURSE CODE : 22PT302

TITLE OF THE COURSE : GENERAL SURGERY

COURSE OBJECTIVES:

THIS COURSE INTENDS TO FAMILIARIZE STUDENTS WITH PRINCIPLES OF GENERAL SURGERY INCLUDING VARIOUS SPECIALTIES LIKE CARDIOVASCULAR, THORACIC, NEUROLOGY AND PLASTIC SURGERY. IT ALSO FAMILIARIZES THE STUDENTS WITH TERMINOLOGY AND ABBREVIATIONS FOR EFFICIENT AND EFFECTIVE CHART REVIEWING AND DOCUMENTATION. IT EXPLORES VARIOUS CONDITIONS NEEDING ATTENTION, FOCUSING ON EPIDEMIOLOGY, PATHOLOGY, AS WELL AS PRIMARY AND SECONDARY CLINICAL CHARACTERISTICS AND THEIR SURGICAL AND MEDICAL MANAGEMENT.

COURSE OUTCOMES:

CO1: To be able to acquire comprehensive knowledge on the basic conditions of general surgery, indications, contraindications, precautions and principles of general surgery and its conditions

CO2: To be able to understand common clinical features, etiology, pathogenesis in general surgery indicated patient

CO3: To collaborate with various health care professionals and optimize outcomes assessment and plan interventions pre and post general surgery in a patient

CO4: To comprehend the advancements and utilize evidence based practices during clinical decision making.

COURSE TITLE –GENERAL SURGERY											
COURSE CODE –22PT302											
Hours				Hours per week				Evaluation pattern			
Theory	Practical	Supervised practical training	Total	Theory	Practical	SPT	Total	Written	Total	Practical	Total



								IA	Final Exam	Final Exam	I A	Final Exam	Final Exam
60	-	-	60	2	-	-		20	20	20	-	-	-

COURSE CONTENTS		
S. No.	Topic	Hours of teaching/learning
1	Section I	5hrs
	Must Know <ul style="list-style-type: none"> Fluid, Electrolyte and Acid-Base disturbances - diagnosis and management Nutrition in the surgical patient Wound healing - basic process involved in wound repair, basic phases in the healing process, clinical management of wounds, factors affecting wound healing Scars - types and treatment Hemostasis - components, hemostatic disorders, factors affecting bleeding during surgery 	
	Nice to know <ul style="list-style-type: none"> Transfusion therapy in surgery - blood components, complications of transfusion Surgical Infections : General Post - Operative Complications and its management 	
2	Section - II	3hrs
	Must Know <ul style="list-style-type: none"> Reasons for Surgery Types of anaesthesia and its affects on the patient Types of Incisions Clips Ligatures and Sutures General Thoracic Procedures - Radiologic Diagnostic procedures Endoscopy - types, Biopsy - uses and types. Overview and Drainage systems and tubes used in Surgery. 	
3	Section - III	4hrs
	Must Know <ul style="list-style-type: none"> Causes, Clinical Presentation, Diagnosis and treatment of the following Thoracic Trauma situations Airway obstruction Pnuemothorax Hemothorax 	
4	Section - IV	3hrs



	segmentectomy - Indications, Physiological changes and Complications ; Thoracoplasty, Pleurectomy, Pleurodesis and Decortication of the Lung	
8	Section VIII Must to know <ul style="list-style-type: none"> Diseases of the Arteries and Veins : Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases : Arteriosclerosis Atherosclerosis Aneurysm Buerger's disease Raynaud's Disease, Thrombophlebitis Deep Vein Thrombosis Pulmonary Embolism Varicose Veins 	5hrs
9	Section IX- Must to know <ul style="list-style-type: none"> Definition, Indication, Incision, Physiological changes and Complications following Common operations - Cholecystectomy Colostomy, Ileostomy Gastrectomy Hernias Appendicectomy Mastectomy Neprectomy Prostectomy 	4hrs
10	Section X- Must to know <ul style="list-style-type: none"> Burn: Definition, Classification, Causes, Prevention, Pathological changes, Complications, Clinical Features and Management- Skin Grafts - Types, Grafting Procedures, Survival of Skin Craft Flaps - Types and uses of Flaps 	4hrs
11	Section XI Nice to know <ul style="list-style-type: none"> ENT: Common problems of ear, otitis media, Otosclerosis, functional achonia and deafness, management facial palsy classification, medical and surgical management of lower motor neuron type of facial palsy. 	3hrs



12	Section XII- Must to know <ul style="list-style-type: none"> • WomensHealth : Menstrual cycle and its disorders. Hormonal disorders of females obesity and female hormones • Cancer of the female reproductive organs- management • Infections and sexually transmitted disease in female • Menopause - its effects on emotions and musculoskeletal system. • Malnutrition and deficiencies in females. • Sterility pathophysiology- investigations- management. • Maternal physiology in pregnancy. Musculo skeletal disorders during pregnancy • Prenatal complications- investigations Management • Child birth- Stages - complications- investigations- management - Pain relief in labour - Purperium - Post Natal care • Surgical procedures involving child birth • Incontinence - Types, Causes, Assessment and Management • Definition, Indications and Management of the following surgical procedures Hysterosalphyngography Dilatation and Curettage Laproscopy Colposopy Hysterectomy 	6hrs
13	Section XIII Must know <ul style="list-style-type: none"> • Ophthalmology: Ophthalmologic surgical conditions, refraction's, conjunctivitis, glaucoma, corneal ulcer, iritis, cataract, retinitis, detachment of retina, defects of extra-ocular muscles- surgical management 	3hrs
14	Section XIV Nice to know Introduction, Indications & Complications of following Neurosurgeries <ul style="list-style-type: none"> • Burr-hole, Craniotomy, Cranioplasty • Deep brain stimulation, Neural implantation • Microvascular decompression surgery • Shunting, Embolization • Ablative surgery - Thalamotomy and Pallidotomy • Coiling of aneurysm and Clipping of aneurysm 	5hrs



	Must know	
	Fractures of Upper Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures: Fractures of clavicle. Fractures of greater tuberosity and neck of humerus. Fracture shaft of humerus. supracondylar fracture of humerus. Fractures of capitulum, radial head, olecranon, coronoid, and epicondyles. Both bone fractures of ulna and radius. Fracture of forearm – Monteggia, Galeazzi fracture –dislocation. Colle's fracture. Smith's fracture. Scaphoid fracture. Fracture of the metacarpals. Bennett's fracture. (Proximal and middle.) Dislocations of Upper Limb - Anterior dislocation of shoulder – mechanism of injury, clinical feature, complications, conservative management (Kocher's and Hippocrates maneuver), surgical management (putti plat, bankart's) etc. Recurrent dislocation of shoulder – mechanism of injury, clinical features and management. Posterior dislocation of elbow- mechanism of injury, clinical feature, complications & management	
	Desirable to know	2
	Fractures of scapula. Side swipe injury of elbow. Chauffer's fracture. Fracture of the phalanges Posterior dislocation of shoulder	
4	Fractures and Dislocations of lower Limb	5
	Must know	
	Fractures and Dislocations of Lower Limb Fracture of Pelvis and Lower Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures: Fracture neck of femur – classification, clinical features, complications, management - conservative and surgical. Fractures of trochanters. Fracture shaft femur—clinical features, mechanism of injury, complications, management-conservative and surgical. supracondylar fracture of femur. Fractures of the condyles of femur. Fracture patella. Fractures of tibial condyles. Both bones fracture of tibia and fibula. Pott's fracture – mechanism of injury, management. Bimalleolar fracture Trimalleolar fracture Fracture calcaneum – mechanism of injury, complications and management. Fracture of talus. Fracture of metatarsals—stress fractures Jone's fracture. Fracture of phalanges. Dislocations of Lower Limb - mechanism of injury, clinical features, complications, management of the following dislocations of lower limb.. Posterior dislocation of hip. Central dislocation of hip. Dislocation of patella. Recurrent dislocation of patella.	
	Desirable to know	2
	Fracture of pelvis. Dupuytren's fracture, Maisonneuve's fracture Anterior dislocation of hip.	
5	Fracture of Spine	5

Recommended books:

1. General Surgical Operations – by Kirk / Williamson
2. Surgery by Nan
3. Bailey and Love's – Short Practice of Surgery
4. Chest Disease by Crofton and Douglas.
5. Patrica A Downie, Text book of Heart, Chest Vascular Disease for physiotherapists, JP Bros.

Question Paper pattern for University Exams –

Long Essay Answers (Answer any 2 out of 3):	2 × 10 = 20 marks
Short Essay Answers (Answer any 8 out of 10):	8 × 5 = 40 marks
Short Answers (Answer all 10 questions):	10 × 2 = 20 marks

Changes made:

1. New Topic/Content is added to curriculum in discussion with respective subject expert (highlighted in color blue).
2. Question paper pattern is added.
3. No. of teaching/learning hours are revised.

COURSE CODE : 22PT303

TITLE OF THE COURSE : ORTHOPAEDICS AND TRAUMATOLOGY

COURSE OBJECTIVES:

INTRODUCE THE STUDENT TO THE ORTHOPEDIC CONDITIONS WHICH COMMONLY CAUSE DISABILITY. PARTICULAR EFFORT IS MADE IN THIS COURSE TO

FACILITATE THE UNDERSTANDING OF STUDENT WITH ANY DETAILS PERTAINING TO DIAGNOSIS WHICH WILL CONTRIBUTE TO THEIR UNDERSTANDING OF THE LIMITATIONS IMPOSED BY ORTHOPEDIC PATHOLOGY ON THE FUNCTIONING OF THE INDIVIDUAL.

COURSE OUTCOMES: At the end of the course, student will be able to:

CO 1: To be able to acquire comprehensive various conditions related to musculoskeletal system of human body.

CO 2: To be able to understand the complications and limitations acquired due to untreated or neglected treatments.

CO 3: To identify the disability caused due to musculoskeletal dysfunction and its impact on society.

CO 4: To set the treatment goals and comprehend the advancements and utilize evidence based practices during clinical decision making.

COURSE TITLE – ORTHOPAEDICS AND TRAUMATOLOGY														
COURSE CODE – 22PT303														
Hours				Hours per week				Evaluation pattern						
T h	Pra c	SP T	Tot al	T h	Pra c	SP T	Tot al	Theory			Th Aggregat e	Practical		Th+Pra c Final Exam
								I A	Writte n exam	V V		I A	Final Exam	
6 0	00	00	60	2	-	-	2	2 0	80	-	-	-	-	100

S.No.	Content/Topic	Hours of teaching /Learning
	UNIT - I	23
1	Introduction to orthopaedics.	2
	Must know	
	Clinical examination in an Orthopedic patient. Common investigative procedures. Radiological and Imaging techniques in Orthopaedics. Inflammation and repair, Soft tissue healing.	
2	Traumatology Fracture	2
	Must know	
	Definition, types, signs and symptoms. Fracture healing, Complications of fractures. Conservative and surgical approaches. Principles of management – reduction (open/closed, immobilization etc). Subluxation/ dislocations – definition, signs and symptoms, management (conservative and operative).	
3	Fractures and Dislocations of Upper Limb	5

	Must to know	
	Fracture of Cervical Spine - Mechanism of injury, clinical feature complications (quadriplegia); Management- immobilization (collar, cast, brace, traction); Management for stabilization, management of complication (bladder and bowel, quadriplegia). Clay shoveller's fracture. Hangman's fracture. Fracture odontoid. Fracture of atlas. Fracture of Thoracic and Lumbar Regions - Mechanism of injury, clinical features, management —conservative and surgical of common fractures around thoracic and lumbar regions. Fracture of coccyx. Fracture of Rib Cage - Mechanism of injury, clinical features, management for Fracture Ribs, Fracture of sternum.	
	UNIT -II	17
6	Soft Tissue Injuries	
	Must know	3
	Define terms such as sprains, strains, contusion, tendinitis, rupture, tenosynovitis, tendinosis, bursitis. Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries: Meniscal injuries of knee. Cruciate injuries of knee. Medial and lateral collateral injuries of knee Lateral ligament of ankle. Wrist sprains. Strains- quadriceps, hamstrings, calf, biceps, triceps etc. Contusions- quadriceps, gluteal, calf, deltoid etc. Tendon ruptures-Achilles, rotator cuff muscles, biceps, pectorals etc.	
7	Hand Injuries	2
	Must know	
	Mechanism of injury, clinical features, and management of the following - Crush injuries. Flexor and extensor injuries. Burn injuries of hand.	
8	Amputations	2
	Must know	
	Definition, levels of amputation of both lower and upper limbs, indications, complications.	
9	Traumatic Spinal Cord Injuries	2
	Must know	
	Clinical features, complications, medical and surgical management of Paraplegia and Quadriplegia.	
10	Deformities	5
	Must know	
	Clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities. Congenital Deformities - CTEV. CDH. Torticollis. Scoliosis. Flat foot. Vertical talus. Hand anomalies- syndactyly, polydactyly and ectrodactyly. Arthrogryposis multiplex congenita (amyoplasia congenita). Limb deficiencies- Amelia and Phocomelia. Klippel-Feil syndrome. Osteogenesis imperfecta (fragile ossium). Cervical rib. Acquired Deformities - Acquired Torticollis. Scoliosis. Kyphosis. Lordosis.	

	Genu varum. Genu valgum. Genu recurvatum Coxa vara. Pes cavus. Hallux rigidus. Hallux valgus. Hammer toe. Metatarsalgia.	
11	Disease of Bones and Joints	3
	Must know	
	Causes, Clinical features, Complications, Management- medical and surgical of the following conditions : Infective conditions: Osteomyelitis (Acute / chronic). Brodie's abscess. TB spine and major joints like shoulder, hip, knee, ankle, elbow etc. Arthritic conditions: Pyogenic arthritis. Septic arthritis. Syphilitic infection of joints. Bone Tumors: classification, clinical features, management - medical and surgical of the following tumors : Osteoma. Osteosarcoma, Osteochondroma. Enchondroma. Ewing's sarcoma. Giant cell tumor. Multiple myeloma. Metastatic tumors. Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis. Metabolic Bone Diseases: Rickets. Osteomalacia, Osteopenia. Osteoporosis.	
	UNIT - III	20
12	Inflammatory and Degenerative Conditions	2
	Must know	
	Causes, clinical feature, complications, deformities, radiological features, management- conservative and surgical for the following conditions : Osteoarthritis. Rheumatoid arthritis. Ankylosing spondylitis Gouty arthritis. Psoriatic arthritis. Hemophilic arthritis. Still's disease (juvenile rheumatoid arthritis). Charcot's joints. Connective Tissue Disorders- Systemic Lupus Erythematosus, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD)	
13	Syndromes	2
	Must know	
	Causes, Clinical features, complications, management- conservative and surgical of the following : Cervico brachial syndrome. Thoracic outlet syndrome. Vertebro- basilar syndrome. Scalenus syndrome. Costo clavicular syndrome. Levator scapulae syndrome. Piriformis syndrome.	
14	Neuromuscular Disorders	2
	Must know	
	Definition, causes, clinical feature, complications, management. (Multidisciplinary approach) medical and surgical of the following conditions : Cerebral palsy. Poliomyelitis. Spinal Dysraphism. Leprosy.	
15	Cervical and Lumbar Pathology	4
	Must know	
	Causes, clinical feature, patho- physiology, investigations, management-Medical and surgical for the following : Prolapsed intervertebral disc (PID), Spinal Canal Stenosis. Spondylosis	



	(cervical and lumbar) Spondylolysis. Spondylolisthesis. Lumbago/ Lumbosacral strain. Sacralisation. Lumbarisation. Coccydynia. Hemivertebra.	
16	Orthopedic Surgeries	4
	Must know	
	Indications, Classification, Types, Principles of management of the following Surgeries : Arthrodesis. Arthroplasty (partial and total replacement). Osteotomy, External fixators. Spinal stabilization surgeries(Harrington's, Luque's, Steffi plating) etc , Limb re-attachments.	
17	Regional Conditions	4
	Must know	
	Definition, Clinical features and management of the following regional conditions Shoulder: Periarthritic shoulder (adhesive capsulitis). Rotator cuff tendinitis. Supraspinatus Tendinitis. Infraspinatus Tendinitis. Bicipital Tendinitis.Subacromial Bursitis. Elbow: Tennis Elbow. Golfer's Elbow. Olecranon Bursitis (student's elbow). Triceps Tendinitis. Wrist and Hand: De Quervain's Tenosynovitis. Ganglion. Trigger Finger/ Thumb. Mallet Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture. Pelvis and Hip : IT Band Syndrome. Piriformis Syndrome. Trochanteric Bursitis. Knee: Osteochondritis Dissecans. Prepatellar and Suprapatellar Bursitis.Popliteal Tendinitis. Patellar Tendinitis. Chondromalacia Patella.Plica Syndrome. Fat Pad Syndrome (Hoffa's syndrome). Ankle and Foot: Ankle Sprains. Plantar Fasciitis / Calcaneal Spur.Tarsal Tunnel Syndrome.Achilles Tendinitis.Metatarsalgia.Morton's Neuroma.	
18	Peripheral Nerve Injuries	2
	Must know	
	Examination of following peripheral nerve injuries –	
	<ul style="list-style-type: none"> • Brachial plexus • Median nerve • Ulnar Nerve • Radial nerve • Sciatic Nerve 	
	Desirable to know	
	Conditions related to above nerve injuries	

Books Recommended:

1. Outline of Fractures—John CrawfordAdams.
2. Outline of Orthopedics.— John Crawford Adams.
3. Text book of Orthopedics.—Maheswari.
4. Apley'sOrthopedics.
5. Textbook of Orthopedics and Traumatology— M.N.Natarajan

Question Paper pattern for University Exams –



Long Essay Answers (Answer any 2 out of 3):

$2 \times 10 = 20$ marks

Short Essay Answers (Answer any 8 out of 10):

$8 \times 5 = 40$ marks

Short Answers (Answer all 10 questions):

$10 \times 2 = 20$ marks

Changes made:

1. New Topic/Content is added to curriculum in discussion with respective subject expert (highlighted in color blue).
2. Question paper pattern is added.
3. No. of teaching/learning hours are revised.



COURSE CODE: 22PT304

22PT371

TITLE OF THE COURSE: ORTHOPEDICS & SPORTS PHYSIOTHERAPY

ORTHOPEDICS & SPORTS PHYSIOTHERAPY PRACTICALS

COURSE OBJECTIVES

THIS COURSE SERVES TO INTEGRATE THE KNOWLEDGE GAINED BY THE STUDENTS IN CLINICAL ORTHOPEDICS WITH THE SKILLS GAINED IN EXERCISE THERAPY, ELECTRO THERAPY AND MASSAGE, THUS ENABLING THEM TO APPLY THESE IN CLINICAL SITUATIONS OF DYSFUNCTION DUE TO PATHOLOGY IN THE MUSCULOSKELETAL SYSTEM.

COURSE OUTCOMES

- 1). THE STUDENT WILL BE ABLE TO COMPREHEND ALL THE TOPICS IN ORTHOPEDICS AND SPORTS PHYSIOTHERAPY COURSE.
- 2). THE STUDENT WILL BE ABLE TO APPLY THE KNOWLEDGE OF ORTHOPEDICS AND SPORTS PHYSIOTHERAPY IN PATIENT CARE AND TREATMENT.
- 3). THE STUDENTS WILL BE ABLE TO HAVE A COMPLETE OVERVIEW ON THE APPLICATION OF ORTHOPEDICS AND SPORTS PHYSIOTHERAPY IN THE CLINICAL SET UP.
- 4). THE STUDENT WILL BE ABLE TO THE KNOWLEDGE OF ORTHOPEDICS AND SPORTS PHYSIOTHERAPY IN THE FIELD OF SPORTS.



Course Title :- Orthopedics and Sports Physiotherapy														
Course Code:- 22PT304														
Course Title :- Orthopedics and Sports Physiotherapy Practicals														
Course Code:- 22PT371														
Course Credit for Orthopedics and Sports Physiotherapy														
Hours				Hrs/Wk				Evaluation Pattern						
Th	Pr	Sct	Tot	Lec	Pr	Sct	Tot	Written		Total	Practical		Total	
								IA	Final exam	VV	Final Exam	IA	Final exam	Final exam
100	50	0	180	2	1		3	20	100	30	150	10	40	50
Topic		Course content							Hours of teaching /Learning					

Sr.No		Theory	Practical
	UNIT 1		
1	PT assessment for Orthopaedic conditions	5	5
	Must to know		
	SOAP format- Subjective - history taking, informed consent, personal, past, medical and socioeconomic history, chief complaints, history of present illness. Pain assessment- intensity, character, aggravating and relieving factors, site and location. Objective- on observation - body built swelling, muscle atrophy, deformities, posture and gait. On palpation- tenderness-grades, muscle spasm, swelling-methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances. On examination – ROM – active and passive, resisted isometric tests, limb length-apparent, true and segmental , girth measurement, muscle length testing-tightness, contracture and flexibility, manual muscle testing, peripheral neurological examination- dermatomes, myotomes and reflexes, special tests and functional tests. Prescription of home program. Documentation of case records, and follow up.		
2	Fractures	7	3
	Must to know		
	PT management in complications - early and late - shock, compartment syndrome, VIC, fat embolism, delayed and mal union, RSD, myositis ossificans, AVN, pressure sores etc. Physiotherapy assessment in fracture cases. Aims of PT management in fracture cases - short and long term goals. Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period.		
3	Specific fractures and dislocations:	8	3
	Must to know		
	PT assessment and management of upper limb fractures and dislocations. PT assessment and management of lower limb fractures and dislocations including pelvis. PT assessment and management spinal fractures.		
4	Physiotherapeutic techniques	2	4
	Must to know		
	Selection and application of physiotherapeutic techniques, manoeuvre's, modalities for preventive, curative and rehabilitative means in all conditions.		
5	Schools of mobilization	4	4
	Must to know		



	Principles of various schools of thought in manual therapy. (Briefly Maitland and McKenzie).		
6	Degenerative and Inflammatory conditions	4	3
	Must to know		
	PT assessment and management and home program for the following conditions – Osteoarthritis - emphasis mainly on knee, hip and hand, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease, Periarthritic shoulder. Osteoporosis- causes, predisposing factors, investigations and PT treatment.		
	UNIT II		
7	Infective conditions	3	
	Must to know		
	PT assessment and management for following conditions – Osteomyelitis – acute and chronic, Septic arthritis, pyogenic arthritis, TB spine and major joints - knee and hip.		
8	Spinal Abnormalities	3	5
	Must to know		
	Define, review the postural abnormalities of spinal column, clinical features, and deformities, medical and surgical management. Describe PT assessment and management and home program.		
9	Congenital Deformities	5	3
	Must to know		
	Review in detail the causes, signs and symptoms, radiological features, medical and surgical management. Describe the PT. assessment and management of the following conditions: Congenital: CTEV, CDH, Torticollis, pes planus, pes cavus and other common deformities. Acquired: scoliosis, kyphosis, coxa vara, genu varum, valgum and recurvatum.		
10	Cerebral palsy:	2	
	Must to know		
	Common orthopaedic deformities, clinical features, complications, conservative and surgical management and home program with special emphasis on carrying techniques. PT management after surgical corrections.		
11	Poliomyelitis	2	
	Must to know		
	Common deformities, conservative and surgical management. PT. assessment and management after surgical corrections and reconstructive surgeries - emphasis on tendon transfer and home program.		
12	Leprosy	2	
	Must to know		



	PT Assessment, aims, and pT management after surgical procedure: tendon transfer both pre and post operatively.		
13	Amputations	3	3
	Must to know		
	Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management.		
14	Spinal conditions:	5	5
	Must to know		
	Review the causes, signs and symptoms, investigations, radiological features, neurological signs. PT assessment, aims, and management and home program of the following conditions: Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacro-iliac joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta.		
15	Spinal Traction	2	2
	Must to know		
	Effects of spinal traction, types of traction, modes of application, indications for spinal traction, contraindications, precautions, limitations of traction.		
16	Orthopaedic surgeries	4	1
	Must to know		
	Pre and post-operative PT assessment, goals, precautions and PT management of following surgeries such as : Arthrodesis, Osteotomy, Arthroplasty-partial and total - Excision arthroplasty, excision arthroplasty with implant, interpositional arthroplasty and total replacement; Tendon transplant, Soft tissue release- tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Re-attachment of limbs, External fixators, Synovectomy.		
	UNIT III	5	4
17	Shoulder joint:		
	Must to know		
	Shoulder instabilities, TOS, RSD, Impingement syndrome - conservative and Post-operative PT management. Total shoulder replacement and Hemi replacement. - Post operative PT management. AC joint injuries - rehabilitation. Rotator cuff tears- conservative and surgical repair. Subacromial decompression - Post operative PT management.		

18	Elbow and forearm	2	1
	Must to know		
	Excision of radial head - Post operative PT management. Total elbow arthroplasty- Post operative PT management.		
19	Wrist and Hand	2	2
	Must to know		
	Total wrist arthroplasty. Repair of ruptured extensor tendons. Carpal tunnel syndrome. Flexor and extensor tendon lacerations - Post operative PT management.		
20	Hip Joint	3	2
	Must to know		
	Joint surgeries - hemi and total hip replacement - Post operative PT management Tendonitis and bursitis - Management.		
21	Knee joint	5	3
	Must to know		
	Lateral retinacular release, chondroplasty- Post operative management. Realignment of extensor mechanism. ACL and PCL reconstruction surgeries - Post operative rehabilitation. Meniscectomy and meniscal repair - Post operative management. Plica syndrome, patellar dysfunction and Hoffa's syndrome- conservative management. TKR- rehabilitation protocol. Patellar tendon ruptures and Patellectomy- rehabilitation.		
22	Ankle and foot	1	2
	Must to know		
	Ankle instability. Ligamentous tears- Post operative management.		
23	Prosthesis and Orthotics	6	
	Must to know		
	Introduction to Bio-Engineering ; Classification of Orthoses and prostheses; Biomechanical principles of orthotic and prosthetic application; Designing of upper extremity, lower extremity and spinal orthosis, indications and check out; Designing of upper extremity and lower extremity prostheses, indications and check out; Psychological aspects of orthotic and prosthetic application; prescription and designing of footwear and modifications.		
24	Sports Physiotherapy	4	2
	Must to know		
	Physical fitness. Stages of soft tissue healing. Treatment guidelines for soft tissue injuries- Acute,		

	Sub acute and chronic stages. Repair of soft tissues-rupture of muscle, tendon and Ligamentous tears. Soft tissue injuries- prevention and rehabilitation of, Lateral ligament sprain of ankle. Rotator cuff injuries. Collateral and Cruciate injuries of knee. Meniscal injuries of knee. Supraspinatus and Bicipital tendonitis. Pre patellar and Subacromial bursitis. Tennis and Golfer's elbow. Hamstring strains, Quadriceps contusion, TA rupture. Dequervain's tenosynovitis. Trigger and Mallet finger. Plantar fasciitis. Wrist sprains		
25	Yoga	1	3
	Must to know		
	Applied Yoga in orthopaedic conditions		
	Desirable to know		
26	Physiotherapy Management for Tumours of the bone.	1	
	Nice to know		
27	Radiological positions, angle calculations for Orthopaedic problems using X ray	1	

Books Recommended:

1. Outline of Fractures—John CrawfordAdams.
2. Outline of Orthopedics.— John Crawford Adams.
3. Text book of Orthopedics.—Maheswari.
4. Apley'sOrthopedics.
5. Textbook of Orthopedics and Traumatology— M.N.Natarajan

Question Paper pattern for University Exams –

Long Essay Answers (Answer any 2 out of 3):	2 × 10 = 20 marks
Short Essay Answers (Answer any 12 out of 14):	12 × 5 = 60 marks
Short Answers (Answer all 10 questions):	10 × 2 = 20 marks

Changes made:

1. New Topic/Content is added to curriculum in discussion with respective subject expert (highlighted in color blue).
2. Question paper pattern is added.
3. No. of teaching/learning hours are revised.



COURSE CODE: 22PT305

22PT372

TITLE OF THE COURSE: CARDIO-RESPIRATORY & GENERAL PHYSIOTHERAPY

CARDIO-RESPIRATORY & GENERAL PHYSIOTHERAPY PRACTICALS

COURSE OBJECTIVES:

THIS COURSE SERVES TO INTEGRATE THE KNOWLEDGE GAINED BY THE STUDENTS IN CLINICAL CARDIORESPIRATORY CONDITIONS WITH THE SKILLS GAINED IN EXERCISE THERAPY, ELECTRO THERAPY AND MASSAGE, THUS ENABLING THEM TO APPLY THESE IN CLINICAL SITUATIONS OF DYSFUNCTION DUE TO PATHOLOGY IN THE CARDIO- RESPIRATORY PATHOLOGY

COURSE OUTCOMES: At the end of course, student shall be able to:

CO 1: To be able to acquire comprehensive knowledge of cardiovascular and respiratory conditions and management.

CO 2: To be able to demonstrate the different treatment and management techniques that improves patient's overall health.

CO 3: To regularly upgrade himself with evidence based practices and learn to contribute towards professional development.

CO 4: To understand the importance of ethical conduct throughout clinical practice and aware the society about the importance of health.

**COURSE TITLE – CARDIO-RESPIRATORY & GENERAL PHYSIOTHERAPY
CARDIO-RESPIRATORY & GENERAL PHYSIOTHERAPY PRACTICALS
COURSE CODE – 22PT305**



22PT372

Hours				Hours per week			Evaluation pattern							
Th	Pra	SP	Tot	T	Pra	SP	Tot	Theory			Practical		Th+Pr	
								IA	Written exam	V V	Theor y Aggregate	IA	Final Exam	Final Exam
100	120	0	250	2	1	0	3	20	100	30	150	-	50	200

Sr. No.	Topic /Course Content	Hours of teaching/learning	
		Theor y	Practica l
UNIT I			
1	Basics of Human Respiratory System	4	-
	Must know		
	<ul style="list-style-type: none"> Anatomical and Physiological differences between the Adult and Pediatric lung Basics of Circulatory System 	2	
2	Bedside assessment of the patient	6	8
	Must know		
	<ul style="list-style-type: none"> Assessment of an Adult Respiratory and Cardiac conditions Assessment of a Paediatric Respiratory and Cardiac conditions 	3 3	5 3
3	Radiological & biochemical & Haematological investigations	8	
	Must know		
	Interpretation & correlate of following investigations with clinical findings and diagnosis of cardio respiratory dysfunction - <ul style="list-style-type: none"> Biochemical analysis-serum enzymes, C.P.K levels, L.D.H., S.G.O.T., S.G.P.T. Troponin T, Lipid profile, Chest X-ray CT Thorax 2-D Echo ECG PFT ABG ABI 		
	EXERCISE TOLERANCE TESTING	2	2
	<ul style="list-style-type: none"> SIMPLE TESTS - ON FIELD TESTS, 6MIN WALK TEST, SHUTTLE WALK TEST GRADED EXERCISE TESTS- PROTOCOLS IN TREADMILL 		



AND CYCLE ERGOMETRY			
4	Physiotherapy techniques to increase lung volume	4	6
	Must know		
	<ul style="list-style-type: none"> • Positioning and Mobilization • Breathing exercises • Neurophysiological Facilitation of Respiration • Mechanical aids: Incentive Spirometry, CPAP, IPPB 		
5	Physiotherapy techniques to decrease work of breathing	3	2
	Must know		
	<ul style="list-style-type: none"> • Positioning • Breathing re-education – Breathing control techniques Mechanical aids – IPPB, CPAP, BiPAP 		
	Desirable to Know		
	<ul style="list-style-type: none"> • Energy Conservation Techniques 		
6	Physiotherapy techniques to clear secretions	6	6
	Must know		
	<ul style="list-style-type: none"> • Hydration, Humidification & Nebulisation • Mobilization and Breathing exercises • Postural Drainage • Manual techniques – Percussion, Vibration and Shaking, Rib Springing, ACBT, Autogenic Drainage • Mechanical Aids – PEP, Flutter, Acapella, RC Cornet, IPPB • Facilitation of Cough and Huff • Suctioning 		
7	Drug Therapy	3	-
	Must know		
	<ul style="list-style-type: none"> • Cardiac Conditions • Pulmonary Conditions • Drug delivery doses and devices like Inhalers and Nebulisers • Drugs to treat inflammation 		
8	Lung Disorders & their PT Management	4	
	Must know		
	Obstructive, Restrictive & Mixed Patterns		
9	Physiotherapy following Lung Surgeries	2	2
10	Management of breathlessness	2	2
	Must know		
	<ul style="list-style-type: none"> • Causes, assessment and management of breathlessness • Scales to measure dyspnoea 		
11	Pulmonary Rehabilitation	2	2
12	Neonatal and Pediatric Physiotherapy	3	3
	Must know		



	<ul style="list-style-type: none"> Chest physiotherapy for children The neonatal unit Modifications of chest physiotherapy for specific neonatal disorders 		
	Desirable to Know		
	Emergencies in the neonatal unit		
13	Intensive care unit	5	3
	Must know		
	<ul style="list-style-type: none"> Assessment of the critically ill patients Monitoring in the ICU Apparatus, Airways and Tubes used in the ICU Physiotherapy management in Common conditions in the ICU – Head Injury, Pulmonary Edema, Multiple Organ Failure, Neuromuscular Disease, Poisoning, Aspiration, ARDS, Shock, Smoke Inhalation, Tetanus, Lung Disease, etc. NICU / PICU treatment & rehabilitation MOBILISATION 		
	Desirable to Know		
	Dealing with Emergency situations in ICU		
14	Respiratory Failure	3	
	Must know		
	<ul style="list-style-type: none"> Types of Respiratory Failure and its management O2 therapy Mechanical Ventilation 		
15	Physiotherapy management for cardiac disorders	2	2
16	Physiotherapy following Cardiac Surgeries		
	Desirable to Know		
	Physiotherapy management in Critical Cardiac Care		
17	PREVENTION OF ATHEROSCLEROSIS AND CARDIOVASCULAR DISEASES Cardiac Rehabilitation	2	2
18	Cardio-pulmonary resuscitation.	1	1
19	Physiotherapy intervention in the management of Oncology Cases	2	2
20	PT Management of Abdominal Surgeries	2	1
	Must know		
	Management of Pulmonary Restorative Dysfunction following Surgical procedures on Abdomen and Thorax		
21	Assessment &PT Management following Peripheral vascular diseases.	3	
	Must know		
	Arterial Diseases		
	Venous Diseases		
	Lymphatic diseases - Lymphedema		
22	Management of wounds and ulcers	2	2



	<ul style="list-style-type: none"> • Diabetes and its complications • PREVENTION AND MANAGEMENT OF PRESSURE SORES • Care of wounds, ulcers & scars • U.V.R and other electro therapeutics measures for healing of wounds • Prevention of Hyper granulated Scars, Keloids • Electrotherapeutics measures for relief of pain during mobilization of scars tissues 		
23	Burns	1	
	Must know		
	<ul style="list-style-type: none"> • PT management of burns, Post grafted management, Mobilization & Musculoskeletal restorative exercises following burns. • Use of pressure garments 		
24	Physiotherapy in dermatology	2	
	Must know		
	<ul style="list-style-type: none"> • U.V.R therapy in various skin conditions; Vitiligo; Hair loss; Pigmentation; Infected wounds ulcers. • Faradic foot bath for Hyperhidrosis • Care of anaesthetic hand and foot • Documentation of assessment, treatment and follow up skin conditions. 		
	Desirable to Know		
	<ul style="list-style-type: none"> • Evaluation, planning and management of leprosy-prescription, fitting and training with prosthetic and orthotic devices 		
25	Physiotherapy in Obstetrics	8	2
	Must know		
	<ul style="list-style-type: none"> • Antenatal Care, Antenatal Education, • Postnatal Care • Electrotherapy and Exercise Therapy measures for the re-education of Ano-Urethral sphincters • LAMAZE BREATHING, STAGES OF LABOUR, COMPLICATIONS OF PREGNANCY • STAGES OF CHILD BIRTH, COMPLICATIONS OF CHILD BIRTH, FOLLOWING SURGERIES LIKE EPISIOTOMIES, DIASTASIS RECTI, VARICOSE VEINS, PUERPERIUM • PELVIC INFLAMMATORY DISEASES, STRESS INCONTINENCE 		
26	Health Fitness and Promotion	5	2
	Must know		
	<ul style="list-style-type: none"> • Fitness Evaluation • Analysis of Body composition • Evaluation and prescription of Exercise • Factors affecting exercise Performance • Exercise Prescription for Specific groups : Elderly, 		

Women and Children.		
	Desirable to Know	
	<ul style="list-style-type: none"> • Outcome Measures in Cardiovascular & Pulmonary Conditions • Cardiorespiratory changes associated with ageing & fitness program. • Familiarization with concept of Quality of life. 	
27	Physiotherapy management of systemic and metabolic conditions	2
	Must know	
	Treatment, Response to exercise and Implications of Physiotherapy in the following disease conditions: Hypertension, Diabetes, Renal Failure and Obesity	
23	Management of Amputations - Use of Prosthesis following	4
	Must know	
	<ul style="list-style-type: none"> • Diabetes • PVD • Ulcers and gangrenes 	
24	Applied Yoga in Cardio-respiratory conditions	2
25	Home program and education of family members in patient care	2

Recommended books:

1. Tidy's physiotherapy.
2. Cash's Text Book of Chest, Heart, Vascular Disorders for Physiotherapists.
3. The Brompton Guide to chest physiotherapy DU Gasket [Completed]
4. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz
5. Elements in Pediatric Physiotherapy – Pamela M Eckersley
6. Essentials of Cardio Pulmonary Physical Therapy by Hillegass and Sadowsky
7. Cardio pulmonary Symptoms in physical Therapy practice Cohen and Michel
8. Chest Physiotherapy in Intensive Care Unit by Mackenzi
9. Cash's Text book of General Medicine and Surgical conditions for Physiotherapists.
10. Physiotherapy in Psychiatry
11. Physical Therapy for the Cancer patient by M.C Garvey



12. Physiotherapy in Obstetrics and Gynecology by Polden

Question Paper pattern for University Exams –

Long Essay Answers (Answer any 2 out of 3):	2 × 10 = 20 marks
Short Essay Answers (Answer any 12 out of 14):	12 × 5 = 60 marks
Short Answers (Answer all 10 questions):	10 × 2 = 20 marks

Changes made:

1. New Topic/Content is added to curriculum in discussion with respective subject expert (highlighted in color blue).
2. Question paper pattern is added.
3. No. of teaching/learning hours are revised.

P. Sathy



BPT II SYLLABUS (2022-2023)

YEAR: II YEAR

COURSE CODE: 22PT201

TITLE OF THE COURSE: PATHOLOGY

COURSE OBJECTIVES:

THE COURSE WILL ENABLE STUDENTS TO UNDERSTAND THE CONDITIONS IN MICROBIOLOGY AND PATHOLOGY AND ITS APPLICATION IN RELATION WITH PHYSIOTHERAPY. STUDENTS WILL LEARN THE PATHOLOGICAL CHANGES IN VARIOUS CONDITIONS, DISEASES AND DISORDERS, WHICH ARE COMMONLY TREATED BY PHYSIOTHERAPY.

COURSE OUTCOMES:

THE EXPECTED OUTCOMES OF THIS COURSE IS THAT AFTER THE PRESCRIBED HOURS OF LECTURES AND DEMONSTRATIONS IN ADDITION TO CLINICAL APPLICATIONS THE STUDENT WILL BE ABLE TO UNDERSTAND THE CAUSES, SIGNS, SYMPTOMS, INVESTIGATIONS, DIFFERENTIAL DIAGNOSIS, FINAL DIAGNOSIS, MANAGEMENT IN RELATION WITH PHYSIOTHERAPY.

COURSE TITLE – Pathology															
COURSE CODE – 22PT201															
Hours				Hours per week				Evaluation pattern							
Th	Pra c	SP T	Tota l	T h	Pra c	SP T	Tota l	Theory			Th Aggr egat e	Practical		Th+Pr ac	
								IA	Written exam	VV		IA	Final Exa m		Final Exam
60	00	00	60	2	-	-	2	10	40	-	-	-	-	-	50

S I N O	Topic		The ory ho urs
UNIT – I : GENERAL PATHOLOGY			
1.	Introducti on to Patholog y	- Must know	1
2.	Cell injury	- Must know <ul style="list-style-type: none"> • Aetiology and Pathogenesis with a brief recall of important aspects of normal cell structure. • Reversible cell injury: Types, Sequential changes, Cellular swellings, vacuolation, Hyaline 	4

		<p>changes, Mucoid changes.</p> <ul style="list-style-type: none"> • Irreversible cell injury: Types of Necrosis & Gangrene, Autolysis. • Pathologic calcification: Dystrophic and Metastatic. <p>-Desirable to know</p> <ul style="list-style-type: none"> • Intracellular Accumulations - Fatty changes, Protein accumulations, Glycogen accumulations, Pigments - Melanin / Hemosiderin. <p>-Nice to know</p> <ul style="list-style-type: none"> • Extra cellular accumulations: Amyloidosis - Classification, Pathogenesis, Pathology including special stains 	
3.	Inflammation and Repair	<p>- Must know</p> <ul style="list-style-type: none"> • Acute inflammation: features, causes, vascular and cellular events. Inflammatory cells and Mediators. • Chronic inflammation: Causes, Types, Classification nonspecific and granulomatous with examples • Repair, Wound healing by primary and secondary union, factors promoting and delaying the process. • Healing in specific site including bone healing 	3
4.	Immunopathology	<p>-Must know</p> <ul style="list-style-type: none"> • AIDS-Aetiology, Modes of transmission, Diagnostic procedures, handling of infected material and health education, <p>- Desirable to know</p> <ul style="list-style-type: none"> • Immune system: General concepts. • Hypersensitivity: type and examples, antibody and cell mediated tissue injury with examples. • Auto-immune disorders: Basic concepts and classification, SLE. 	3
5.	Infectious diseases	<p>- Must know</p> <ul style="list-style-type: none"> • Mycobacterial diseases: Tuberculosis, Leprosy and Syphilis. <p>- Desirable to know</p> <ul style="list-style-type: none"> • Bacterial disease: Pyogenic, Diphtheria, Gram negative infection, Bacillary dysentery. • Viral diseases: Poliomyelitis, Herpes, Rabies, Measles, Ricktsia, Chlamydial infection • Fungal disease and opportunistic infections. • Parasitic diseases: Malaria, Filaria, Amoebiasis, Kala-azar, Cysticercosis, Hydatid cyst. 	4
UNIT – II : GENERAL PATHOLOGY + HEMATOLOGY + SYSTEMIC PATHOLOGY			
6.	Growth	- Must know .	6

	<p>Disturbances and Neoplasia</p> <ul style="list-style-type: none"> • Precancerous lesions. • Neoplasia: Definition, classification, Biological behaviour • Benign and Malignant, Carcinoma and Sarcoma. • Malignant Neoplasia: Grades and Stages, Local & Distant spread. • Benign & Malignant epithelial tumours • Benign & Malignant mesenchymal tumours <p>-Desirable to know</p> <ul style="list-style-type: none"> • Atrophy, Hypertrophy, Hyperplasia, Aplasia, Hypoplasia, Metaplasia, Malformation, agenesis, dysplasia. • Carcinogenesis: Environmental carcinogens, chemical, viral, occupational. <p>-Nice to know</p> <ul style="list-style-type: none"> • Heredity and cellular oncogenes and prevention of cancer 	
7.	<p>Nutritional Disorders</p> <p>- Must know</p> <ul style="list-style-type: none"> • Marasmus, Kwashiorkor • Vitamin deficiency disorders, classification with specific examples <p>-Desirable to know</p> <ul style="list-style-type: none"> • Protein energy malnutrition 	2
8.	<p>Genetic disorders</p> <p>-Desirable to know</p> <ul style="list-style-type: none"> • Basic concepts of genetic disorders and some common examples and congenital malformation. 	1
9.	<p>Hematology</p> <p>- Must know</p> <ul style="list-style-type: none"> • Constituents of blood and bone marrow, Regulation of hematopoiesis. • Anemia: Classification, clinical features & lab diagnosis. • Hemostatic disorders, Vascular and Platelet disorders & lab diagnosis. Coagulopathies - (i) Inherited (ii) Acquired with lab diagnosis. • Leukocytic disorders: Leukocytosis, Leukopenias, <p>-Desirable to know</p> <ul style="list-style-type: none"> • Nutritional anemias: Iron deficiency anemia, Folic acid, Vit. B 12 deficiency 	7

		<p>anemia including pernicious anemia.</p> <ul style="list-style-type: none"> • Hemolytic Anaemias: Classification and Investigations. Hereditary hemolytic anaemias: Thalessemia, Sickle cell anemia, Spherocytosis and Enzyme deficiencies. Acquired hemolytic anaemias. Alloimmune, Autoimmune ii. Drug induced, Microangiopathic Pancytopenia - Aplastic anemia. • Leukemoid reaction. • <p>Leukemia:Classification,c linicalmanifestation,pathologyandDiagnosis</p> <ul style="list-style-type: none"> • Multiple myeloma • Blood transfusion; Grouping and cross matching, untoward reactions, transmissibleinfections including HIV & hepatitis, Blood-components & plasma-pheresis. 	
1 0.	Respiratory System	<p>- Must know Pneumonia, Bronchitis, Bronchiectasis, Asthma, Tuberculosis</p> <p>-Desirable to know Occupational lung diseases, Carcinoma of lungs</p>	3
1 1.	Cardiovascular system	<p>- Must know</p> <ul style="list-style-type: none"> • Vascular diseases: Atherosclerosis, monckeberg's medial calcification, • Ischemic heart Disease: Myocardial infarction. • Hypertension and Hypertensive heart disease. <p>-Desirable to know</p> <ul style="list-style-type: none"> • Endocarditis. • Rheumatic Heart disease <p>-Nice to know</p> <ul style="list-style-type: none"> • Congenital Heart disease: Atrial septal defect, Ventricular septal defect, Fallot's tetralogy, Patent ductus arteriosus 	4

1 2.	Alimentary tract	<ul style="list-style-type: none"> • Aneurysm <p>- Must know</p> <ul style="list-style-type: none"> • Stomach : Gastritis, Ulcer & Tumours. • Tumours and tumour like condition of the small and large Intestine: Polyps, carcinoid, carcinoma, Lymphoma. <p>-Desirable to know</p> <ul style="list-style-type: none"> • Oral Pathology: Ulcers, leukoplakia, Carcinoma oral cavity diseases • Tumours of salivary gland • Esophagus and precancerous lesions: Esophagus inflammatory, functional disorders and tumours. • Pancreatitis & Pancreatic tumours 	4
UNIT - III : SYSTEMIC PATHOLOGY			4
1 3.	Hepato - biliary pathology	<p>- Must know</p> <ul style="list-style-type: none"> • Jaundice: Types, aetiopathogenesis and diagnosis. • Hepatitis • Alcoholic liver disease • Cirrhosis <p>-Desirable to know</p> <ul style="list-style-type: none"> • Abscesses: Pyogenic, parasitic and Amoebic • Tumours of Liver 	4
1 4.	Lymphatic System	<p>- Must know</p> <ul style="list-style-type: none"> • Lymphadenitis - Nonspecific and granulomatous • Causes of Lymph Node enlargements. • Causes of Splenic Enlargements. <p>-Nice to know</p> <ul style="list-style-type: none"> • Primary Tumours - Hodgkin's and Non hodgkin's Lymphomas, Metastatic Tumours • Diseases of the gall bladder: Cholecystitis, Cholelithiasis, Carcinoma 	2
1 5.	Musculoskeletal System	<p>- Must know</p> <ul style="list-style-type: none"> • Osteomyelitis, acute, chronic, tuberculous, mycetoma • Metabolic diseases: 	4

		<p>16. Rickets/Osteomalacia, osteoporosis, Hyperparathyroidism, Paget's disease.</p> <ul style="list-style-type: none"> • Arthritis: Suppurative, Rheumatoid, Osteoarthritis, Gout, Tuberculous. <p>- Desirable to know</p> <ul style="list-style-type: none"> • Tumours Classification: Benign, Malignant, Metastatic 	
1 6.	Endocrine pathology	<p>- Must know</p> <ul style="list-style-type: none"> • Diabetes Mellitus: Types, Pathogenesis, Pathology, Laboratory diagnosis • Non-neoplastic lesions of Thyroid: Iodine deficiency goiter, autoimmune Thyroiditis, Thyrotoxicosis, Myxedema, Hashimoto's thyroiditis. • Tumours of Thyroid: Adenoma, Carcinoma: Papillary, Follicular, Medullary, Anaplastic. <p>- Desirable to know</p> <ul style="list-style-type: none"> • Adrenal diseases: cortical hyperplasia, atrophy tumors of cortex and medulla. 	3
1 7.	Neuropathology	<p>- Must know</p> <ul style="list-style-type: none"> • Inflammations and Infections : TB Meningitis, Pyogenic Meningitis, Viral meningitis • Brain Abscess • Cysticercosis <p>- Desirable to know</p> <ul style="list-style-type: none"> • CNS Tumors: names according to age & site, clinical features, diagnosis, prognosis. 	3
1 8.	Dermatopathology	<p>- Must know</p> <ul style="list-style-type: none"> • Skin tumours: SCC, BCC, MM 	2

Recommended Textbooks:

1. Text book of pathology: Harshmohan
2. General systemic pathology: Churchill Livingstone
3. Text book of Pathology: Robbins

YEAR: II YEAR

COURSE CODE: 22PT202

TITLE OF THE COURSE: MICROBIOLOGY

COURSE OBJECTIVES:

THE COURSE WILL ENABLE STUDENTS TO UNDERSTAND THE CONDITIONS IN MICROBIOLOGY AND PATHOLOGY AND ITS APPLICATION IN RELATION WITH PHYSIOTHERAPY. STUDENTS WILL LEARN THE PATHOLOGICAL CHANGES IN VARIOUS CONDITIONS, DISEASES AND DISORDERS, WHICH ARE COMMONLY TREATED BY PHYSIOTHERAPY.

COURSE OUTCOMES:

THE EXPECTED OUTCOMES OF THIS COURSE IS THAT AFTER THE PRESCRIBED HOURS OF LECTURES AND DEMONSTRATIONS IN ADDITION TO CLINICAL THE STUDENT WILL BE ABLE TO UNDERSTAND THE CAUSES, FINDINGS, INVESTIGATIONS, MANAGEMENT IN RELATION WITH PHYSIOTHERAPY.

COURSE TITLE – Microbiology															
COURSE CODE – 22PT202															
Hours				Hours per week				Evaluation pattern							
Th	Pra c	SP T	Tota l	T h	Pra c	SP T	Tota l	Theory			Th Aggr egat e	Practical		Th+Pr ac	
								IA	Written exam	VV		IA	Final Exa m		Final Exam
60	00	00	60	2	-	-	2	10	40	-	-	-	-	-	50

S.I No	Topic		Theor y hours
UNIT – I : GENERAL MICROBIOLOGY			
1.	Infection	- Desirable know <ul style="list-style-type: none"> • Definition of Infection. • parasites, host, vector, fomite, • contagious disease, infectious disease, • epidemic, endemic, pandemic, • zoonosis, Epizootic, • Attack rate. 	1
2.	Routes of infection and spread	- Must know <ul style="list-style-type: none"> • Explain the various routes of endogenous and exogenous infections • Define the Source at reservoir of infections. 	1
3.	Normal flora of the body	-Nice to know <ul style="list-style-type: none"> • Describe Normal flora of the human body 	1

4.	Bacterial cell: Anatomy	-Must know <ul style="list-style-type: none"> • Explain labeled diagram of Morphology of bacterial cell limited to recognizing bacteria in clinical samples. • Discuss about the shape, motility and arrangements, which are, virulence associated. 	1
5.	Sterilization and Disinfection and in relation to patient care and disease prevention	- Must know <ul style="list-style-type: none"> • Define Asepsis. • Classify & describe various methods of sterilization methods. • Classify the Disinfectants used in hospital • Describe Methods to test efficacy of disinfectants 	2
6.	Hospital acquired infections	- Must know <ul style="list-style-type: none"> • Describe Hospital acquired infection – Types, causative agents, mode of transmission and prophylaxis. • Explain the standard precautions in relation to the patient care and disease prevention. 	2
7.	Antimicrobials	-Nice to know <ul style="list-style-type: none"> • Describe different methods of antimicrobial susceptibility testing and interpretation of susceptibility tests. • Explain the mode of action of antimicrobials and resistance spectrum developed. 	1
8.	Immunity	- Must know <ul style="list-style-type: none"> • Define Immunity and Mechanism of immunity. • Describe in detail humoral immunity • Describe in detail cell mediated immunity. • Explain the structure and function of immune system –lymphoid organ and tissue. 	2
9.	Antigen	- Desirable to know <ul style="list-style-type: none"> • Define& classify Antigen. Describe characteristics of Antigens 	1
10.	Antibody	- Desirable to know <ul style="list-style-type: none"> • Define& classify Antibody. Describe characteristics of antibody 	1
11.	Antigen-Antibody reaction	- Must know <ul style="list-style-type: none"> • Describe in detail about General Properties and the types of antigen-antibody reactions with relevant to pathogenesis. • Brief introduction on Serological tests: Agglutination, Precipitation, ELISA, Immunofluorescence, Immunochromatography. 	1

12.	Hypersensitivity	- Must know <ul style="list-style-type: none"> • Define & classify Hypersensitivity reactions • Explain the mechanism of Hypersensitivity reactions & outcome measuring immune functions. 	1
UNIT – II : SYSTEMATIC BACTERIOLOGY			
6.	Staphylococcus	- Must know <ul style="list-style-type: none"> • Describe the morphology, mode of transmission and various diseases caused by Staphylococcus and discuss the laboratory diagnosis • Methicillin Resistant Staphylococcus aureus. 	2
7.	Streptococcus and Pneumococcus	- Must know <ul style="list-style-type: none"> • Classify Streptococci and describe the mode of transmission and various diseases caused by Streptococcus and add a note on its laboratory diagnosis protocol. • Describe the cultural characteristics and diagnosis of S.pyogenes & Streptococcus pneumonia. 	2
8.	Mycobacteria	- Must know <ul style="list-style-type: none"> • Describe the morphology, modes of transmission, clinical presentation and laboratory diagnosis of Mycobacterium tuberculosis • Describe the morphology, modes of transmission, clinical presentation laboratory diagnosis of Mycobacterium leprae. • Classify and diseases caused by Atypical mycobacteria/Non-Tuberculosis Mycobacteria. 	2
9.	Escherichia coli and Klebsiella sp.	- Must know <ul style="list-style-type: none"> • Classify the Enterobacteriaceae family • Discuss the laboratory diagnosis of UTI. • Discuss the cultural characteristics and diarrhoeal diseases caused by E.coli • Discuss the cultural characteristics and diseases caused by Klebsiella species. 	2
10.	Pseudomonas	- Desirable to know <ul style="list-style-type: none"> • Discuss the clinical presentation & laboratory diagnosis • Discuss the role of Pseudomonas in hospital infections. 	1
11.	Vibrio cholera	- Desirable to know <ul style="list-style-type: none"> • Discuss the clinical presentation & laboratory diagnosis of cholera • Discuss the diseases caused by halophilic 	1

		vibrios.	
12.	Bacillus anthracis Clostridia, Bacteroides and Fusobacterium.	- Desirable to know <ul style="list-style-type: none"> • Discuss clinical presentation & the laboratory diagnosis of anthrax. • Describe the morphology, disease associated and laboratory diagnosis of Clostridium species. • Classify and discuss the laboratory diagnosis of non-sporing anaerobes. 	2
13.	General properties	- Desirable to know <ul style="list-style-type: none"> • Discuss briefly basic structure and broad classification of viruses. • List of medically important viruses' pathogenesis and infections caused by viruses. • Explain the about the immunity and prophylaxis of viral diseases 	1
14.	HIV	- Must know <ul style="list-style-type: none"> • Describe morphology, epidemiology, mode of transmission of HIV • Describe clinical features of AIDS • Describe various methods of laboratory diagnosis of HIV. • Add a note on preventive measures 	2
15.	HBV	- Must know <ul style="list-style-type: none"> • Discuss the morphology ,clinical features, laboratory diagnosis and prophylaxis of - Hepatitis B. 	1
16.	HCV	- Desirable to know <ul style="list-style-type: none"> • Discuss the morphology, mode of transmission , clinical features, laboratory diagnosis of Hepatitis C 	1
17.	HSV	- Must know <ul style="list-style-type: none"> • Discuss the morphology, mode of transmission , clinical features, laboratory diagnosis of HSV 	1
18.	Polio virus	- Desirable to know <ul style="list-style-type: none"> • Discuss the Morphology, clinical features, laboratory diagnosis of Polio virus and immunization. 	1
19.	Rubella	- Nice to know <ul style="list-style-type: none"> • Discuss the Morphology, clinical features, laboratory diagnosis of Rubella 	1
20.	Measles	- Nice to know <ul style="list-style-type: none"> • Discuss the Morphology, clinical features, laboratory diagnosis of Measles 	1

UNIT – III : MYCOLOGY			
21.	Introduction and classification of fungi	<p>-Desirable to know</p> <ul style="list-style-type: none"> Classify medically important fungi, diseases caused: superficial, subcutaneous, opportunistic infections including mycotoxins, systemic mycoses. Discuss the recent updates on Laboratory diagnosis of fungal infections. Discuss the common antifungal agents and mode of action. 	2
22.	Introduction and classification of Parasites	<p>- Must know</p> <ul style="list-style-type: none"> Classify medically important parasites, diseases caused and the Laboratory diagnosis of parasitic infections including sample collection. Add a note on Opportunistic parasitic infections. 	1
23.	Malaria	<p>- Must know</p> <ul style="list-style-type: none"> Explain briefly about the clinical features, laboratory diagnosis of Malaria Explain briefly about the various methods in prophylaxis for Malaria. 	1
24.	Filariasis	<p>- Must know</p> <ul style="list-style-type: none"> Classify somatic nematodes. Describe the life cycle and clinical features and laboratory diagnosis of Brugia Malayi Describe the life cycle and clinical features and laboratory diagnosis of Wuchereria Bancrofti 	1
25.	Pyrexia of unknown origin(PUO)	<p>- Must know</p> <ul style="list-style-type: none"> Definition, Classification & their definition Common Causes & pathogenesis of fever Clinical presentations Lab diagnosis 	1
26.	Sexually transmitted diseases(STIs)	<p>- Must know</p> <ul style="list-style-type: none"> Definition, Classification Common STIs Clinical presentations & complications Etiological agents Lab diagnosis Treatment Prevention & control strategies National control programs 	1

27.	Acute respiratory infections	<ul style="list-style-type: none"> - Must know • Definition, Classification • Etiological agents • Clinical presentations & complications • Factors influencing- host, environment <ul style="list-style-type: none"> • Lab diagnosis • Treatment • Prevention & control strategies 	2
28.	CNS infections	<ul style="list-style-type: none"> - Must know • Definition, Classification • Common CNS infections & Etiological agents • Clinical presentations & complications • Lab diagnosis • Treatment • Prevention & control strategies 	2
29.	Urinary tract infections	<ul style="list-style-type: none"> - Must know • Definition, Classification • Common terminologies & Etiological agents • Clinical presentations & complications • Lab diagnosis • Treatment • Prevention & control strategies 	1
30.	Pelvic inflammatory diseases	<ul style="list-style-type: none"> - Must know • Definition, causes, Risk factors & Etiological agents • Clinical presentations & complications • Lab diagnosis • Treatment • Prevention & control strategies 	1
31.	Wound infections	<ul style="list-style-type: none"> - Must know • Definition, causes, Risk factors • Types, mode of infection & Etiological agents • Clinical presentations • Lab diagnosis • Treatment 	1
32.	Opportunistic infections	<ul style="list-style-type: none"> - Must know • Definition, Classification • Etiological agents & Risk factors • Clinical presentations • Lab diagnosis • Treatment • Prevention—patient education & control strategies 	1
33.	Zoonotic diseases	<ul style="list-style-type: none"> - Desirable to know 	1

		<ul style="list-style-type: none"> • Definition, Classification • Etiological agents & Risk factors • Clinical presentations • Lab diagnosis • Treatment • Prevention—patient education & control strategies 	
34.	Demonstration of basic techniques	<ul style="list-style-type: none"> • Hand hygiene Techniques • Gloves and Kits – Donning and Doffing • Instrument handling and use 	8

Reference Books

1. Introduction to medical microbiology- Ananthanarayana- Orient Longman Pvt. Ltd.
2. Robert Cruickshank- Medical Microbiology- The Practice of Medical Microbiology
3. Chatterjee- Parasitology- Interpretation to Clinical Medicine
4. Rippon- Medical Mycology
5. Basic Laboratory methods in Parasitology, J P Bros, New Delhi
6. Basic Laboratory procedures in clinical bacteriology, J P Bros, New Delhi
7. Medical Parasitology- Ajit Damle
8. Ananthanarayana & Panikar Medical Microbiology- University Press

YEAR: II YEAR

COURSE CODE: 22PT203

TITLE OF THE COURSE: PHARMACOLOGY

COURSE OBJECTIVES:

THIS COURSE COVERS THE BASIC KNOWLEDGE OF PHARMACOLOGY INCLUDING ADMINISTRATION, PHYSIOLOGIC RESPONSE AND ADVERSE EFFECTS OF DRUGS UNDER NORMAL AND PATHOLOGIC

CONDITIONS. TOPICS FOCUS ON THE INFLUENCE OF DRUGS IN REHABILITATION PATIENT/CLIENT MANAGEMENT. DRUGS USED IN IONTOPHORESIS AND PHONOPORESIS WILL BE DISCUSSED IN DETAIL.

COURSE OUTCOMES:

THE EXPECTED OUTCOMES OF THE COURSE IS THAT AFTER THE PRESCRIBED HOURS OF LECTURES AND DEMONSTRATIONS, THE STUDENT WILL BE ABLE TO UNDERSTAND THE EFFECTS AND THE ADVERSE EFFECTS OF VARIOUS DRUGS ON DIFFERENT SYSTEMS OF THE BODY. THIS WOULD HELP THE STUDENTS TO UNDERSTAND THE LIMITATIONS IMPOSED BY THE DRUGS ON ANY THERAPY.

COURSE TITLE – Pharmacology															
COURSE CODE – 22PT203															
Hours				Hours per week				Evaluation pattern							
Th	Pra	SP	Tota	T	Pra	SP	Tota	Theory			Th Aggr egate	Practical		Th+Pr ac	
								IA	Written exam	VV		IA	Final Exam		
74	00	00	74	2	-	-	2	20	80	-	-	-	-	-	100

S.I No	Topic	Theory hours
UNIT – I		
1.	General Pharmacology	6
	<p>- Must to know</p> <ul style="list-style-type: none"> • Introduction to pharmacology • Classification of drugs • Sources of drugs • Routes of administration. • Pharmaco-kinetics - Absorption and distribution of drugs. • Pharmaco-kinetics - Drug Biotransformation & drug Excretion. • Pharmaco-dynamics – Dose response relationship. • Adverse drug reactions. • Factors modifying drug action. <p>-Desirable to know</p> <ul style="list-style-type: none"> • Drug development. 	
2.	Drugs acting on Autonomic Nervous System and Peripheral Muscle Relaxants	7
	<p>- Must to know</p> <ul style="list-style-type: none"> • General considerations – The Sympathetic and Parasympathetic Systems • Receptors • Cholinergic and Anti-Cholinergic 	

		<p>drugs</p> <ul style="list-style-type: none"> • Adrenergic and Adrenergic blocking drugs <p>-Desirable to know</p> <ul style="list-style-type: none"> • Somatic Nervous System • Muscle relaxants. <p>-Nice to know</p> <ul style="list-style-type: none"> • Glaucoma • Autonomic changes during exercise. 	
3.	Drugs acting on CVS	<p>- Must to know</p> <ul style="list-style-type: none"> • Drugs Used in the Treatment of Heart Failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors • Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors • Drugs Used in the Treatment of Vascular Disease and Tissue Ischemia • Ischemic Heart Disease – Nitrates, Beta-Blockers, Calcium Channel Blockers <p>-Desirable to know</p> <ul style="list-style-type: none"> • Anti-arrhythmic Drugs • Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators <p>-Nice to know</p> <ul style="list-style-type: none"> • Cardiovascular changes during exercise. 	7
4	Drugs acting on blood	<p>-Must to know</p> <ul style="list-style-type: none"> • Hemostasis Antithrombotics, Anticoagulants and Thrombolytics • Hyperlipidemic drugs • Cerebral Ischemia Peripheral Vascular Disease. <p>- Desirable to know</p> <ul style="list-style-type: none"> • Haematinics and Erythropoietin • Treatment of shock 	4
UNIT- II			
5.	Drugs used in Psychiatric conditions	<p>- Must to know</p> <ul style="list-style-type: none"> • Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines • Antianxiety Drugs: Benzodiazepines, Other Anxiolytics • Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase 	6

		<p>Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium Antipsychotic drugs</p> <ul style="list-style-type: none"> • Antiepileptic Drugs • Drugs used to treat alcoholism <p>-Desirable to know</p>	
6.	Chemotherapy	<p>- Must to know</p> <ul style="list-style-type: none"> • General principles of chemotherapy. • Anti-Tuberculosis drugs • Anti -Leprosy drugs • Beta – Lactam antibiotics – I (Penicillins) • Beta – Lactam antibiotics – II (Cephalosporins) <p>-Desirable to know</p> <ul style="list-style-type: none"> • Sulfonamides & Fluoroquinolones. • Macrolides & aminoglycosides • Tetracyclines & chloramphenicol (Broad spectrum antibiotics) • Immunosuppressants <p>-Nice to know</p> <ul style="list-style-type: none"> • Anti- fungal drugs • Anti- malarial drugs • Anti- protozoal drugs • Anti- viral drugs • Anti- cancerous drugs 	8
7.	Endocrinology	<p>- Must to know</p> <ul style="list-style-type: none"> • Introduction to Endocrinology, • Thyroid hormones and Anti-thyroid drugs. • Treatments of diabetes mellitus. • Corticosteroids • Glucocorticoids: Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids <p>-Desirable to know</p> <ul style="list-style-type: none"> • Oestrogen and Progesterone (effects on CNS, coagulation) • Vitamins and Calcium Metabolism, Phosphorous and Magnesium, 	6

		Selenium, Zinc -Nice to know	
8.	Drugs used in Respiratory Conditions	- Must to know <ul style="list-style-type: none"> • Drugs used in Treatment of Obstructive Airway Diseases – COPD, Bronchial Asthma • Drugs to treat COVID- 19 • Drugs used in Upper Respiratory Tract Infections - Allergic Rhinitis, Sinusitis, cough, laryngitis, Pharyngitis. 	4
UNIT- III			
9.	Inflammatory/Immune Diseases	- Must to know <ul style="list-style-type: none"> • Antipyretics • Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Nonaspirin NSAIDs, Drug Interactions with NSAIDs • Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout • Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythmatosus, Scleroderma, Demyelinating Disease, Neuropathies -Desirable to know -Nice to know <ul style="list-style-type: none"> • Neuromuscular changes during exercise. 	7
10.	Geriatrics	- Must to know <ul style="list-style-type: none"> • Drugs used in Treatment of Parkinson's Disease • Dementia • Postural hypotension -Desirable to know <ul style="list-style-type: none"> • Adverse effects of special concern in the Elderly 	4
11.	Drugs acting in Gastrointestinal Disorders and Metabolism	- Must to know <ul style="list-style-type: none"> • Peptic Ulcer • Constipation 	5

		<ul style="list-style-type: none"> • Laxatives • Anti-diarrhoeal drugs -Desirable to know <ul style="list-style-type: none"> • Anti-emetics • Intestinal Bowel Disorder drugs 	
12.	Drugs used in Pain Management	- Must to know <ul style="list-style-type: none"> • Anaesthesia –All types • Analgesics – all types • Opioids 	3
13.	Miscellaneous topic	- Must to know <ul style="list-style-type: none"> • Drugs used in hyperhidrosis (Botox, Zinc) • Bone health: Vitamin D, Calcium homeostasis, Bisphosphonates, Calcitonin, Parathyroid hormone. • Drug Abuse and recreation of drugs: Steroids, Diuretics, Marijuana, Cocaine, Cannabinoids and others. -Desirable to know <ul style="list-style-type: none"> • Vaccines and Sera • Drugs used in Organo-Phosphate Poisoning and Nicotine Poisoning • Drugs used in dermatological conditions: Psoriasis, Scabies -Nice to know <ul style="list-style-type: none"> • Vertigo • Migraine 	7

Recommended Textbooks

1. Lippicott's Pharmacology.
2. Essential of Medical Phramacology by Tripathi
3. Text book of Medical Pharmacology by Padmajaudaykumar
4. Pharmacolgy by N.Muruges
5. Pharmacolgy&Pharmacotherapeutics by Sadoskar.

YEAR: II YEAR

COURSE CODE: 22PT204

22PT271

TITLE OF THE COURSE: EXERCISE THERAPY

EXERCISE THERAPY PRACTICALS

COURSE OBJECTIVES:



IN THIS COURSE THE STUDENT WILL LEARN THE PRINCIPLES, TECHNIQUES AND EFFECTS OF EXERCISE AS A THERAPEUTIC MODALITY IN THE RESTORATION OF PHYSICAL FUNCTION.

COURSE OUTCOMES:

THE EXPECTED OUTCOMES OF THIS COURSE IS THAT AFTER THE PRESCRIBED HOURS OF LECTURES AND DEMONSTRATIONS IN ADDITION TO PRACTICAL AND CLINIC THE STUDENT WILL BE ABLE TO LIST THE INDICATIONS AND CONTRAINDICATIONS OF VARIOUS TYPES OF EXERCISE, DEMONSTRATE THE DIFFERENT TECHNIQUE, AND DESCRIBE THE EFFECTS.

COURSE TITLE – Exercise Therapy														
Exercise Therapy Practicals														
COURSE CODE – 22PT204														
22PT271														
Hours				Hours per week				Evaluation pattern						
Th	Pra	SP	Tota	T	Pra	SP	Tota	Theory			Th Aggr egate	Practical		Th+Pr ac
								IA	Written exam	VV		IA	Final Exam	
10	120	30	250	4	5	1	10	20	100	30	150	-	50	200

Sr.No.	Topic /Course Content	Hours of teaching/learning	
		Theor y	Practic al
UNIT I			
1	Basics of Movement science	8	8
	Must know	2	
	The aims of Exercise Therapy, The techniques of Exercise Therapy, Approach to patient's problems	4	
	Define the following terms and describe the principles involved with suitable examples: force, gravity, equilibrium, lever, springs, tension, elasticity, axes, planes, Speed, Velocity, Work, Energy, Power, Acceleration, Momentum, Friction and Inertia.	2	6
	Starting Positions – Fundamental positions & derived Positions, Planning of Treatment		
	Desirable to know		2
	Assessment of patient's condition – Measurements of Vital parameters	3	
2	Physiology of muscle contraction	3	
	Must know	2	
	Structure of skeletal muscle, chemical & mechanical events during contraction & relaxation, muscle fibre type, motor unit, force gradation, Causes of decreased		

	muscle performance Physiologic adaptation to training: Strength & Power, Endurance.		
	Type of contraction – Isometric, Isotonic, Isokinetic, Eccentric.	1	
3	Assessment of muscle strength	7	24
	Must know		
	Goniometry (Revision): ROM-Definition, Normal ROM for all peripheral joints & spine, Goniometer-parts, types, principles, uses, Limitations of goniometry, Techniques for measurement of ROM for all peripheral joints .	2	10
	Manual Muscle Testing: Introduction to MMT, Principles & Aims, Indications & Limitations, Techniques of MMT for group & individual muscles : Techniques of MMT for upper limb / Techniques of MMT for lower limb / Techniques of MMT for spine Anthropometric Measurements: Muscle girth – biceps, triceps, forearm, quadriceps, calf Static power Test Dynamic power Test Endurance test Speed test	5	12
	Desirable to know		
	Measurement of Limb Length: true limb length, apparent limb length, segmental limb length. Pelvic tilt: Measurement of the angle of Pelvic Inclination.		2
4	Classification of movements	10	18
	Must know		
	Active Movements	4	6
	Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses Active Assisted Exercise: principles, techniques, indications, contraindications, effects and uses Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses Resisted Exercise: Definition, principles, indications, contraindications, precautions & techniques, effects and uses Types of resisted exercises: Manual and Mechanical resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise.		
5	Specific exercise regimens Isotonic:	2	6
	Must know		
	de Lormes, Oxford, MacQueen, Circuit weight training Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple Angle Isometrics Isokinetic regimens		
6	Passive Movements	4	4
	Must know		
	Causes of immobility, Classification of Passive movements, Specific definitions related to passive		

	movements, Principles of giving passive movements, Indications, contraindications, effects of uses, Techniques of giving passive movements.		
Unit II			
7	Proprioceptive Neuromuscular Facilitation	5	5
	Must know		
	: Definitions & goals Basic neurophysiologic principles of PNF; Muscular activity, Diagonals patterns of movement: upper limb, lower limb Procedure: components of PNF Techniques of facilitation Mobility: Contract relax, Hold relax, Rhythmic initiation Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization Stability: Alternating isometric, rhythmic stabilization Skill: timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal		
8	Suspension Therapy	4	5
	Must know		
	Definition, principles, equipment's & accessories, Indications & contraindications, Benefits of suspension therapy Types of suspension therapy: axial, vertical, pendular Techniques of suspension therapy for upper limb Techniques of suspension therapy for lower limb		
9	Functional Re-education	4	6
	Must know		
	Lying to sitting: Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities and gait; Lowerlimb and Upperlimb activities.		
10	Relaxation :	4	3
	Must know		
	Definitions: Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathological tension in muscle, Stress mechanics, types of stresses, Effects of stress on the body mechanism, Indications of relaxation, Methods & techniques of relaxation- Principles & uses: General, Local, Jacobson's, Mitchel's, additional methods.	3	
	Nice to know	1	
	Muscle fatigue, muscle spasm and tension (mental and		
11	Aerobic Exercise	4	2
	Must know		
	Definition and key terms; Physiological response to aerobic exercise, Examination and evaluation of aerobic capacity – Exercise Testing, Determinants of an Exercise Program, The Exercise Program, Normal and abnormal response to acute aerobic exercise, Physiological changes that occur with training, Application of Principles of an Aerobic conditioning program for patients – types and phases of aerobic		



	training.		
12	Manual Therapy & Peripheral Joint Mobilization	5	6
	Must know		
	Schools of Manual Therapy, Principles, Grades, Indications and Contraindications, Effects and Uses – Maitland, Kaltenborn, Mulligan Biomechanical basis for mobilization, Effects of joint mobilisation, Indications and contraindications, Grades of mobilization, Principles of mobilization, Techniques of mobilization for upper limb, lower limb, Precautions.		
13	Stretching	3	6
	Must know		
	Definition of terms related to stretching; Tissue response towards immobilization and elongation, Determinants of stretching exercise, Effects of stretching, Inhibition and relaxation procedures, Precautions and contraindications of stretching, Techniques of stretching.		
14	Hydrotherapy	3	4
	Must know		
	Definitions, Goals and Indications, Precautions and Contraindications, Properties of water, Use of special equipments, techniques, Effects and uses, merits and demerits		
UNIT III			
15	Posture	4	4
	Definition, Active and Inactive Postures, Postural Mechanism, Patterns of Posture, Principles of re-education: corrective methods and techniques, Patient education		
16	Balance	3	4
	Must know		
	Physiology of balance: contributions of sensory systems, processing sensory information, generating motor output Components of balance (sensory, musculoskeletal, biomechanical) Causes of impaired balance, Examination & evaluation of impaired balance, Activities for treating impaired balance: mode, posture, movement, Precautions & contraindications, Types Balance retraining		
17	Co-ordination Exercise	3	4
	Must know		
	Anatomy & Physiology of cerebellum with its pathways Definitions: Co-ordination, Inco-ordination Causes for Inco-ordination, Test for co-ordination: equilibrium test, non-equilibrium test Principles of co-ordination exercise Frenkel's Exercise: uses of Frenkel's exercise, technique of Frenkel's exercise, progression, home exercise.		

18	Walking Aids	3	4
	Must know		
	Walking aids Revision. Application: Pre crutch Training and crutch gaits.		
19	Massage	4	6
	Must know		
	Classification of Massage Technique Principles, Indications and Contraindications Technique of Massage Manipulations Physiological and Therapeutic Uses of Specific Manipulations	3	
	Nice to know		
	History, various types of soft tissue manipulations techniques.	1	
20	Breathing exercises	4	6
	Must know		
	Goals, Types of breathing exercises- Inspiratory, Expiratory, Segmental, Forced Expiratory- coughing & huffing, Modified Inspiratory, Active cycle of breathing. • Physiology of the above mentioned technique • Indication, contraindication & its importance for patient		
21	Individual and Group Exercises	3	4
	Must know		
	Advantages and Disadvantages, Organisation of Group exercises, Recreational Activities and Sports		
22	Human dignity and Human Rights	2	
	Must know		
	Human dignity as an intrinsic value • Respect , care and Equality in dignity of all human beings • human dignity in different cultural and moral traditions • Ethical aspects of physiotherapists in patients relation in regard to human dignity in handling children, women, elderly, mental & Physically challenged		
23	Elements of Yoga	4	3
	Must know		
	Asanas – Principles and elements; Pranayamas – 3Principles, Methods and Techniques		
24	SPT	-	30

Recommended Textbooks:

1. Therapeutic exercise by Barbara Bandy
2. Therapeutic exercise by Carolyn Kisner
3. Principles of exercise therapy by M.Dena Gardiner
4. Practical Exercise therapy by Hollis Margaret
5. Therapeutic exercise by Sydney Litch
6. Therapeutic exercise by Hall & Brody



7. Therapeutic exercise by Basmajian
8. Physical Rehabilitation by Sullivan.
9. Therapeutic massage by Sinha
10. Principles of muscle testing by Hislop.

YEAR: II YEAR

COURSE CODE: 22PT205

22PT272

TITLE OF THE COURSE: ELECTROTHERAPY



ELECTROTHERAPY PRACTICALS

COURSE OBJECTIVES:

IN THIS COURSE THE STUDENT WILL LEARN THE PRINCIPLES, TECHNIQUE AND EFFECTS OF ELECTROTHERAPY AS A THERAPEUTIC MODALITY IN THE RESTORATION OF PHYSICAL FUNCTION.

COURSE OUTCOMES:

THE EXPECTED OUTCOMES OF THIS COURSE IS THAT AFTER THE PRESCRIBED HOURS OF LECTURES, DEMONSTRATIONS, PRACTICALS AND CLINICS THE STUDENT WILL BE ABLE TO LIST THE INDICATIONS AND CONTRAINDICATIONS OF VARIOUS TYPES OF ELECTROTHERAPY DEMONSTRATE THE DIFFERENT TECHNIQUE AND DESCRIBE THEIR EFFECTS.

COURSE TITLE – Electrotherapy Electrotherapy Practicals														
COURSE CODE – 22PT205 22PT272														
Hours				Hours per week				Evaluation pattern						
Th	Pra c	SP T	Tota l	T h	Pra c	SP T	Tota l	Theory			Th Aggr egat e	Practical		Th+Pr ac Final Exam
								IA	Written exam	VV		IA	Final Exa m	
10 0	120	30	250	4	5	1	10	20	100	30	150	-	50	200

Sr. No.	Topic / Course Contents	Hours of teaching learning	
		Theor y	Practic al
UNIT – I			
1	Section I - Introductory Physics	20	12
	Must Know Electricity definition, types Static electricity a. Production of electrical charges. b. Characteristics of charged body. c. Characteristics of lines of forces. d. Potential difference and EMG. Current Electricity a. Units of Electricity, faraday, volt, ampere, coulomb, watt. b. Resistance in series and parallel. c. Ohms law and its application to DC/AC. d. Fuse.		

	<p>e. Shock: Micro/ Macro shocks, safety precaution and management, earthing techniques & precautions.</p> <p>f. Burns: electrical & chemical burns, prevention and management.</p> <p>g. Condensers: definition, principles, types, construction, working and uses.</p> <p>Magnetism: Definition, properties, electro-magnetic induction, electro- magnetic spectrum.</p> <p>Valves, transformers, types, principles, construction and working.</p> <p>Ionization: Principles, effects of various technique of medical ionization.</p>		
2	<p>Section II – Therapeutic Electricity :Low Frequency currents</p>	55	40
	<p>Must Know</p> <p>Physiological effects, therapeutic uses, indications and contraindications and dangers of faradic type current, intermittent galvanic current and galvanic current</p> <ul style="list-style-type: none"> ➤ Cathodal & Anodal Galvanism, Iontophoresis with various ions & Pharmaco therapeutic drugs. ➤ Faradic current under pressure /elevation, Faradic Foot Bath ➤ Electrical stimulation for re-education–short /long pulse motor points <p>Electrical Reactions and Electro-diagnostic tests:</p> <ul style="list-style-type: none"> ➤ Electrical Stimuli & normal behavior of Nerve & muscle ➤ Types of lesion & development of reaction of degeneration. ➤ Faradic – Intermittent direct current test. ➤ S.D. Curve and its application and characteristics ➤ Chronaxie, Rheobase & Pulse ratio ➤ High voltage pulsed galvanic current <p>TENS: Define, Principles of production, types, dosage, electrode placement, Physiological and therapeutic effects, indication & contraindications.</p>		
	<p>Desirable to know</p> <p>Micro –currents</p> <p>Didynamic currents</p>		
	<p>Nice to know-</p> <ul style="list-style-type: none"> ➤ Functional electrical stimulation ➤ Long wave diathermy ➤ NEMS, Matrix Rhythm Therapy 		
UNIT -II			
3	<p>Section – III - Therapeutic Electricity: Medium frequency currents</p>	18	28

	<p>Must Know</p> <p>Interferential therapy: Define, Principles of production, static Interferential system, dynamic interference system, dosage, electrode placement, Physiological and therapeutic effects, indication and contraindications</p>		
	<p>Desirable to Know</p> <ul style="list-style-type: none"> ➤ Russian currents ➤ Rebox type currents <p>Biofeedback method:</p> <ul style="list-style-type: none"> ➤ Instrumentation, principles, therapeutic effects, ➤ Indications, contraindications, limitations, precautions, ➤ Operational skills and patient preparation 		
	<p>Must Know</p> <p>Ultraviolet rays (UVR):</p> <ul style="list-style-type: none"> ➤ Wavelength, frequency, types & sources of UVR generation, ➤ Techniques of irradiation, physiological & therapeutic effects ➤ Indications, Contraindications, precautions, operational skills of equipment & patient preparation. ➤ Dosimetry of UVR. <p>Light Amplification of stimulated Emission of Radiation (LASER)</p> <ul style="list-style-type: none"> ➤ Definition, historical background, physical principles, biophysical effects, types, production, therapeutic effects ➤ Techniques of application, indications, contraindications, precautions ➤ Operational skills and patient preparation. <p>Care of wound –application of Therapeutic currents, Ultrasound, U.V.R. & LASER</p>		
Nice to know- Combination Therapy			
	<p>Desirable to Know</p> <p>Intermittent Therapy unit, its operation and different methods of application region wise.</p> <p>Interferential Pneumatic Therapy unit, its operation and different methods of application – region wise.</p>		
	<p>Nice to know</p> <p>Respect for human vulnerability and personal integrity</p> <ul style="list-style-type: none"> ➤ Different aspects of vulnerability - biological , social , cultural ➤ Success and failures in physiotherapy treatments ➤ Problems with the basic assumption that 		



	<p>vulnerability should be eliminated</p> <ul style="list-style-type: none"> ➤ Care ethics- New approaches in bioethics, Solidarity, duty to care ➤ Relation between vulnerability and personal integrity 		
4	Section IV- HIGH FREQUENCY CURRENTS AND WAVES	25	14
	<p>Must know</p> <p>High frequency currents (S.W.D.)</p> <ul style="list-style-type: none"> ➤ Production, biophysical effects, types ➤ Therapeutic effects, techniques of application ➤ Indications, contraindications, precautions ➤ Operational skills and patient preparation <p>High frequency sound waves (Ultrasound)</p> <ul style="list-style-type: none"> ➤ Physics of sound including characteristics and propagation ➤ Production, biophysical effects, types ➤ Therapeutic effects, techniques of application ➤ Indications, contraindications, precautions ➤ Operational skills and patient preparation 		
UNIT -III			
5	Section V Superficial heating Modalities	33	22
	<p>Must Know</p> <p>Wax Therapy: Principle of Wax Therapy application – latent Heat, Composition of Wax Bath Therapy unit, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers</p>	4	2
	<p>Must know</p> <p>Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications</p>	3	2
	<p>Must know</p> <p>Moist Heat Therapy: Hydro collator packs – in brief, Methods of applications, Therapeutic uses, Indications & Contraindications.</p>	4	2
	<p>Must know</p> <p>Cyclotherm: Principles of production, Therapeutic uses, Indications & Contraindications</p>	3	2
	<p>Must know</p> <p>Fluidotherapy: Construction, Method of application, Therapeutic uses, Indications & Contraindications.</p>	3	2
	<p>Must know</p> <p>Whirl Pool Bath: Construction, Method of Application, Therapeutic Uses, Indications & Contraindications</p>	3	2
	<p>Magnetic Stimulation, Principles, Therapeutic uses, Indications & contraindication.</p>	2	2
	<p>Must know</p> <p>Cryotherapy: Define- Cryotherapy, Principle- Latent heat of fusion, Physiological & Therapeutics effects,</p>	6	2

	Techniques of Applications, Indications & Contraindications, Dangers, Methods of application with dosages.		
6	Section-VI TRACTION	5	4
	Must know <ul style="list-style-type: none"> ➤ Principles of traction, classification, types ➤ Physiological & therapeutic effects ➤ Indications, contraindications ➤ Techniques of application ➤ Operational skills & precautions 		
7	SPT	-	30

Recommended textbooks:

1. Claytons Electrotherapy by Forster & Plastangs
2. Electrotherapy Explained by Low & Reed
3. Clinical Electrotherapy by Nelson
4. Electrotherapy Evidence based practice by Sheila Kitchen
5. Physical agents by Michile Cameroon
6. Principles of Electrotherapy by Michile Camreeron
7. Thermal agents by Susan Michlovitz.

YEAR: II YEAR

COURSE CODE: 22PT206

TITLE OF THE COURSE: RESEARCH METHODOLOGY



COURSE OBJECTIVES:

COURSE OUTCOMES:

COURSE TITLE – Research Methodology															
COURSE CODE – 22PT206															
Hours				Hours per week				Evaluation pattern							
Th	Pra c	SP T	Tota l	T h	Pra c	SP T	Tota l	Theory			Th Aggr egat e	Practical		Th+Pr ac Final Exam	
								IA	Written exam	VV		IA	Final Exa m		
40	00	00	40	1	-	-	1	10	40	-	-	-	-	-	50

S.I No	Topic		Theory hours
UNIT – I			
1.	Introduction to Research Methodology	- Must to know <ul style="list-style-type: none"> ➤ Definition of research ➤ Objectives of research ➤ Types of methods and design in research ➤ Qualities of good research ➤ Issues in research. 	6
2.	Statement of research problem	- Must to know <ul style="list-style-type: none"> • Selection of research question • Hypothesis • Defining the aims and objectives • Defining research problem. 	4
3.	Selection of research design	- Must to know <ul style="list-style-type: none"> • Types of research designs • Principles of research design 	4
UNIT- II			
4.	Sampling [methods and designs]	- Must to know <ul style="list-style-type: none"> • Types of sampling method • Calculation of sample size • Characteristics of good sample method 	4
5.	Measurement and scaling techniques	- Must to know <ul style="list-style-type: none"> • Measurement in research – measurement scales • Sources of error in measurement • Technique of developing measurement tools • Meaning of scaling, its 	6

		classification • Important scaling techniques	
6.	Methods of data collection	- Must to know • Types • Collection • Selection of data tool	4
UNIT- III			
7.	Processing and analysis of data	- Must to know • Processing operations • Problems in processing • Types of analysis • Testing of hypothesis • Statistics in research • Measures of central tendency • Dispersion • Asymmetry	6
8.	Ethics in research	- Must to know • Misconduct • Plagiarism • How to prepare and publish a research paper	4
9.	Computer technology	- Must to know • Introduction to computers • Computer application in research • Computers and researchers	2

Recommended Textbooks:

1. Research Principles and Methods: L Denise F. Poli & amp; Hungler
2. Fundamentals of Research, 4 th Edn.: David J. fox
3. Introduction to research for Physiotherapists by Hicks

YEAR: II YEAR

COURSE CODE: 22PT207



TITLE OF THE COURSE: PROGRAMME ELECTIVE I

COURSE OBJECTIVES:

The objectives are to develop an understanding of basic orthotic and prosthetic devices, their uses, prescriptions, check outs and training for various musculoskeletal, neuromuscular disorders.

COURSE OUTCOMES:

At the completion of the course, students will be able to:

- 1.1 Understand the historical aspects, materials and instrumentation of common prostheses and orthoses
- 1.2 Understand the classification and basic principles of working of common prosthetic and orthotic devices
- 1.3 Understand the role of a Physiotherapist in the process of prescribing and designing of prosthesis, orthosis & assistive devices
- 1.4 Understand the uses, assessment and prescription of common prosthesis, orthotics and assistive devices.
- 1.5 Demonstrate various methods of training a patient with prosthesis, orthosis or assistive devices to achieve functional independence

Note: Long questions should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know.

COURSE TITLE – Programme Elective I															
COURSE CODE – 22PT207															
Hours				Hours per week				Evaluation pattern							
Th	Pra c	SP T	Tota l	T h	Pra c	SP T	Tota l	Theory			Th Aggr egat e	Practical		Th+Pr ac Final Exam	
								IA	Written exam	VV		IA	Final Exa m		
40	00	00	40	1	-	-	1	10	40	-	-	-	-	-	50

S.I No	Topic	Theory hours
UNIT – I		
1.	Introduction to Bioengineering - Must to know <ul style="list-style-type: none"> • Uses of orthotics and prosthetics • Equipments • Materials • Classification of orthotics • Classification of prosthetics • Classification of adaptive devices 	10

		<ul style="list-style-type: none"> • Biomechanical principles • Internal force system • External force system • Biomechanical analysis • Pathomechanical analysis • Biomechanics of orthosis and prosthesis <p>- Nice to know</p> <ul style="list-style-type: none"> • Historical aspects 	
2.	Role of physiotherapist	<p>- Must to know</p> <ul style="list-style-type: none"> • Prescription of orthotic and prosthetic devices • Check outs of orthotic and prosthetic devices • Training with orthotic and prosthetic devices • Ergonomic modifications 	6
3.	Adaptive devices	<p>- Must to know</p> <ul style="list-style-type: none"> • Overview • Adaptive devices for ADL • Sitting devices for multiple disabled • Adaptive devices for recreational activities • Adaptive devices for sports. 	4
UNIT- II			
4.	Footwear modifications	<p>- Must to know</p> <ul style="list-style-type: none"> • Types of footwear and their parts • Functions of footwear • Footwear modification for deformities • Footwear modification for foot ulcers • Role of footwear in enhancement of sports performance • Prevention of sports injuries by footwear modifications 	6
5.	Orthotics	<p>- Must to know</p> <ul style="list-style-type: none"> • Overview • Upper limb • Lower limb • Spinal • Orthotics for neurological disorders • Orthotics for musculoskeletal disorders • Fitting and alignment techniques • Clinical applications • Maintenance of orthoses 	6
6.	Prosthetics	<p>- Must to know</p> <ul style="list-style-type: none"> • Upper limb 	4

		<ul style="list-style-type: none"> • Lower limb • Aesthetic • Clinical applications • Fitting and alignment techniques • Complications of prosthetics 	
UNIT- III			
7.	Recent advances	- Nice to know <ul style="list-style-type: none"> • Bionic arm • Bionic foot • 3d printed prosthetics & orthotics 	4

Reference-

1. Bella J M: Amputation and Prosthetics: A case study Approach, Jaypee Brothers, New Delhi, 2 Ed, 2002.
2. Kent K Wu Foot: Orthoses Principles and clinical application, Williams and Wilkins, London, 1990.
3. Ron Seymour: Prosthetics and Orthotics Lower limb and spinal, Lippincott Williams and Wilkins, New York, 2002.
4. Lunsardi MM, Nielsen CC: Orthotics and prosthetics in rehabilitation, Butterworth Heinemann, New Delhi, Oxford, 2000.
5. Edelstein J E and Bruckner J: Orthotics A comprehensive clinical approach Jaypee brothers, New Delhi, 2004.
6. Shurr D G, Michael J W, Cook TM: Prosthetics and Orthotics Prentice hall, Michigan, 2 Ed, 2001.
7. Bowker JH, Michael JW: Atlas of limb prosthetics: surgical, prosthetics, and rehabilitation principles, Mosby, Michigan, 2 Ed, 1992.
8. Gerhardt JJ, Philip SK, Zetti JH: Immediate and early prosthetics management: Rehabilitation aspects. Huber Michigan, 2 Ed, 1986.
9. Bussell MH: New advances in prosthetics and orthotics, an issue of Physical Medicine and Rehabilitation clinics, Elsevier Health Sciences Division, 2006.
10. Janardhanam K: Topics on prosthetics and Orthotics, Educom System, Chennai, 2003.

YEAR: II YEAR

COURSE CODE: 22PT208

TITLE OF THE COURSE: PROGRAMME ELECTIVE II

COURSE OBJECTIVES:



The objectives are to develop an understanding of nutrition, balanced diet, their importance, assessment methods and relation with different disorders like musculoskeletal, neurological, paediatric disorders.

COURSE OUTCOMES:

At the completion of the course, students will be able to:

- 1.1 Understand the science of nutrition in daily life and in patient care.
- 1.2 Describe the Recommendation of Daily Allowances in India and by WHO.
- 1.3 Understand the role of a nutrition in overall healing in different disorders.
- 1.4 Describe different assessment techniques with advances related to food and nutrition.

Note: Long questions should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know.

COURSE TITLE – Programme Elective II															
COURSE CODE – 22PT208															
Hours				Hours per week				Evaluation pattern							
Th	Pra c	SP T	Tota l	T h	Pra c	SP T	Tota l	Theory			Th Aggr egat e	Practical		Th+Pr ac Final Exam	
								IA	Written exam	VV		IA	Final Exa m		
40	00	00	40	1	-	-	1	10	40	-	-	-	-	-	50

S.I No	Topic		Theory hours
UNIT – I			
1.	Introduction to Nutrition	- Must know <ul style="list-style-type: none"> • Introduction to Food Science • Optimum nutrition, balanced diet, reference man, reference woman • Water & electrolyte balance - Desirable to know <ul style="list-style-type: none"> • Structure, Physical & Chemical properties of different types of foods constituents - Cereals & grains, Pulses & legumes, Vegetables & fruits, Nuts & oilseeds, Milk & milk products, Meat & poultry, Sugar & fat. 	5
2.	Importance of nutrition in different disorders	- Must know <ul style="list-style-type: none"> • Role of Nutrients and Energy Expenditure • Musculoskeletal disorders and related Nutrition 	8

		<p>Guidelines</p> <ul style="list-style-type: none"> • Neurological Physiotherapy disorders and related Nutrition Guidelines • Sports Injuries disorders and related Nutrition Guidelines • Cardio-Respiratory Physiotherapy disorders and related Nutrition Guidelines • Paediatrics Physiotherapy disorders and related Nutrition Guidelines • Obstetrics and Gynaecological Physiotherapy disorders and related Nutrition Guidelines 	
UNIT- II			
3.	Human Nutritional Requirements	<p>- Must know</p> <ul style="list-style-type: none"> • Energy – Introduction, basal metabolic rate, calculating energy requirements, energy expenditure using bomb calorimeter, indirect calorimeter etc, specific dynamic action of food, deriving nutritional requirements & recommended dietary allowances for energy for different age groups, specific dynamic action of food • Minerals & Vitamins - Deriving nutritional requirements and recommended dietary allowances for entire life span (infancy to old age) for vitamins & minerals • Critical evaluation of International recommended dietary allowances –WHO Recommended dietary allowances & Guidelines for Indians. 	8
4.	Nutritional Disorders	<p>- Must know</p> <ul style="list-style-type: none"> • Major Nutritional problems: <ul style="list-style-type: none"> - Protein energy malnutrition - Kwashiorkor - Marasmus - Anemia - vitamin A deficiency - Iodine deficiency disorder. • Minor Nutritional Problems <ul style="list-style-type: none"> - Scurvy - beri- beri - pellagra - rickets 	8



		<ul style="list-style-type: none"> - osteomalacia - osteoporosis - zinc deficiency & fluorosis <p>- Nice to know</p> <ul style="list-style-type: none"> - Their prevalence, etiology, biochemical & clinical manifestations, diagnostic techniques, preventive & therapeutic measures. 	
UNIT- III			
5.	Assessment of Nutritional Status	<p>- Must know</p> <p>Various techniques for assessment of nutritional status:</p> <ul style="list-style-type: none"> - Anthropometric measurements - Clinical examination - Biochemical estimations - Dietary survey 	8
6.	Recent advances	<p>- Nice to know</p> <ul style="list-style-type: none"> • Super foods and its effect on human body • Food science and Technology 	3

REFERENCE BOOKS:

1. Nutrition care & therapeutic nutrition. Krause.
2. Clinical dietetics & nutrition, Antia F.P. Oxford University Press (III edition) 1989
3. Therapeutic nutrition. B.Srilakshmi
4. Food Science- B. Srilakshmi.
5. Clinical Dietetics Manual – Indian Dietetics Association.
6. Nutritional problems of India – P.K. Shukla BSc Clinical Nutrition & Dietetics 20/29
7. Human Nutrition & dietetics, (Davidson & Passmore) Passmore Rand Eastwood M.A. (1986) 8th Ed. English language book society/ Churchill Livingstone.
8. Text book of Human Nutrition. Bamji MS, Rao R.N. & Reddy V. Oxford & IBH Pub Co. PVT LTD, New Delhi
9. Nutrient requirement & Recommended Dietary Allowances for Indians, ICMR 1990.
10. Indian Food Composition Table, NIN, ICMR
11. Nutritive Value of Indian Foods – NIN, ICMR
12. <https://pubmed.ncbi.nlm.nih.gov/31940634>



P. Sathy



DAYANANDA SAGAR UNIVERSITY

Hosur Rd, kudlu gate, srinivasa nagar, HAL layout, singasandra, Bengaluru, Karnataka 560068

SCHOOL OF DESIGN AND DIGITAL TRANSMEDIA

2021 Batch – 5th and 6th Semester

BACHELOR OF DESIGN

MATERIAL EXPLORATIONS-II



DAYANANDA SAGAR
UNIVERSITY

SY
LL
A
B
US
SE
M
ES
TE
R
V
For
Prod
uct
Desi
gn

SEMESTER	V					
YEAR	III					
COURSE CODE						
TITLE OF THE COURSE	MATERIAL EXPLORATIONS-II					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	2	-	65	4

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES:
<ul style="list-style-type: none"> • Understand plastics and its role in engineering and design • Understand properties of plastics that are important in engineering and design • Learn selection criteria for use of plastics in design • Learn about plastics from manufacturing and environmental perspective • Learn about latest trends in plastics and their applications

COURSE OUTCOMES:

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Comprehend the significance of plastics in engineering and design.	L2
CO2	Examine the essential properties of plastics relevant to engineering and design.	L3
CO3	Evaluate the criteria for selecting plastics in design applications.	L4
CO4	Analyze plastics from manufacturing and environmental viewpoints.	L3
CO5	Assess the latest trends in plastics and their diverse applications.	L4



DAYANANDA SAGAR
UNIVERSITY

DESIGN STUDIO III - MINI-PROJECT-IV

SEMESTER	V					
YEAR	III					
COURSE CODE	Course 351					
TITLE OF THE COURSE	DESIGN STUDIO III - MINI-PROJECT-IV					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Project s Hours	Total Hours	Credits
	2	-	4	-	78	4

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course
1.			

COURSE OBJECTIVES :

- To understand and use rapid visualization techniques in appropriate contexts
- To be able to develop quick mockups and 3D models
- To generate several alternate solutions
- To model and visualize ideas and concepts generated
- To prototype ideas and concepts

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Elaborate on rapid visualizations techniques.	L1
CO2	Develop quick mock-ups, quick 3D models.	L3
CO3	Develop animations of the concepts.	L3

CO4	Explain and Illustrate various rapid prototyping techniques.	L5
CO5	Develop rapid prototypes.	L6



DAYANANDA SAGAR
UNIVERSITY

PRODUCT PLANNING AND STRATEGY BUILDING

SEMESTER	V
YEAR	III

COURSE CODE	Course 352					
TITLE OF THE COURSE	PRODUCT PLANNING AND STRATEGY BUILDING					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Project s Hours	Total Hours	Credits
	3	-	2	-	65	4

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES:

- Identify and analyse the strategic elements of product development processes.
- Develop a product innovation charter
- Apply idea generation techniques, and
- Create and test viable product concepts using appropriate assessment techniques.
- Assess the challenges and opportunities associated with the launch of new products
- Propose a framework suitable for the management of a new product development process.

COURSE OUTCOMES:

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Classify the strategic elements of product development	L2
CO2	Develop a product innovation charter	L3
CO3	Apply idea generation techniques.	L3
CO4	Test viable product concepts	L5

CO5	Construct a framework suitable for the management of a new product	L6
-----	--	----



DAYANANDA SAGAR
UNIVERSITY

PROFESSIONAL ELECTIVE - I - MOTION GRAPHICS

SEMESTER	V
YEAR	III
COURSE CODE	
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE - I - MOTION GRAPHICS

SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	-	52	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course
	V/III		Motion Graphics

COURSE OBJECTIVES :

- **Master Motion Graphics Software:** Develop proficiency in using Adobe Animate CC and After Effects, understanding their interfaces, tools, and capabilities for creating compelling motion graphics.
- **Apply Animation Techniques:** Gain a solid grasp of animation principles and techniques within both Animate CC and After Effects, enabling the creation of dynamic and visually appealing animations.
- **Design Visual Effects:** Learn to apply a variety of visual effects, filters, and color correction techniques in After Effects, enhancing the visual quality of motion graphics projects.
- **Create Interactive Motion Designs:** Explore the integration of interactivity into motion graphics using Animate CC and After Effects, enabling the creation of engaging user-triggered animations and interactive prototypes.
- **Execute Comprehensive Projects:** Apply skills from animation, visual effects, and interactivity to design and execute a final motion graphics project, showcasing a blend of creativity, technical expertise, and effective communication.

COURSE OUTCOMES:

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Demonstrate the ability to navigate Adobe Animate CC and After Effects interfaces, effectively utilizing tools and features for motion graphics creation.	L2

CO2	Produce animations using both frame-by-frame and keyframe techniques, displaying a solid understanding of animation principles such as timing, spacing, and easing.	L2
CO3	Apply visual effects, filters, and color correction techniques to improve the overall aesthetic quality of their motion graphics projects in After Effects.	L3
CO4	Design and implement interactive motion graphics projects using Animate CC and After Effects, showcasing user-triggered animations and enhancing user engagement.	L2
CO5	Execute a final motion graphics project that integrates animation, visual effects, and interactivity, demonstrating their ability to communicate effectively through motion graphics.	L4

PROFESSIONAL ELECTIVE - I - DESIGN OF SMART SYSTEMS

SEMESTER	V
YEAR	III
COURSE CODE	Course

TITLE OF THE COURSE	PROFESSIONAL ELECTIVE - I - DESIGN OF SMART SYSTEMS					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	-	52	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES:

- To understand System Design Process.
- To apply multidisciplinary approaches to Design engineering problem solving.
- To create smart solutions using micro-controllers.
- To develop integrated system-level solutions
- To propose a final smart system design for solving a real-life problem.

COURSE OUTCOMES:

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Infer and Interpret System Design Process.	L2
CO2	Apply multidisciplinary approaches to Design engineering problem solving.	L3
CO3	Create smart solutions using micro-controllers.	L6
CO4	Develop integrated system-level solutions.	L6
CO5	Propose a final smart system design for a real problem.	L6



DAYANANDA SAGAR
UNIVERSITY

PROFESSIONAL ELECTIVE - I - VEHICLE STYLING

SEMESTER	V					
YEAR	III					
COURSE CODE						
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE - I - VEHICLE STYLING					
	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Project s Hours	Total Hour s	Credits

SCHEME OF Instruction	2	-	2	-	52	3
------------------------------	----------	----------	----------	----------	-----------	----------

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :

- To understand the process of styling and sketch the concepts for vehicle styling
- To be able to create development and mass production timelines with for the sketches of the vehicle style developed
- To be able to understand and elaborate the concepts of engine development, transmission and steering, suspension as required for vehicle styling
- To be able to understand and elaborate on the concepts of Aerodynamics, vibration, crashworthiness, ergonomics and vehicle control systems as required for vehicle styling
- To be able to create full sized tape drawing and clay modeling of concepts

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Elaborate on the process of styling and sketch the concepts for vehicle styling	L2
CO2	Create development and mass production timelines with for the sketches of the vehicle style developed	L3
CO3	Elaborate on the concepts of engine development, transmission and steering, suspension as required for vehicle styling	L2

CO4	Elaborate on the concepts of Aerodynamics, vibration, crashworthiness, ergonomics and vehicle control systems as required for vehicle styling	L5
CO5	Create full sized tape drawing and clay modeling of concepts	L5



DAYANANDA SAGAR
UNIVERSITY

PROFESSIONAL ELECTIVE - I- DESIGN SEMIOTICS AND SEMANTICS

SEMESTER	V
YEAR	III
COURSE CODE	PLACEHOLDER(21BD3501)
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE - I- DESIGN SEMIOTICS AND SEMANTICS

SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	-	52	3

#	Sem/Year	Course Code	Title of the Course

Course Objectives

Define and explain key concepts in semiotics and their relevance to design

Analyze and deconstruct the semiotic elements present in existing designs

Apply semantic theories to create designs that convey specific meanings

Evaluate design choices in terms of cultural, social, and historical contexts

Integrate semiotic and semantic principles into a cohesive design project

CO No.	Course Outcomes	Bloom's Taxonomy Levels
1	Understand the fundamentals of semiotics and its application in design	L2
2	Analyze and interpret design elements using semiotic principles	L3
3	Apply semantic theories to communicate effectively through design	L4
4	Critically evaluate the cultural and social implications of design choices	L5
5	Develop a design project integrating semiotic and semantic principles	L6



DAYANANDA SAGAR UNIVERSITY

PROFESSIONAL ELECTIVE - II - DESIGN MANAGEMENT

SEMESTER	V					
YEAR	III					
COURSE CODE	Course					
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE - II - DESIGN MANAGEMENT					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	-	52	3

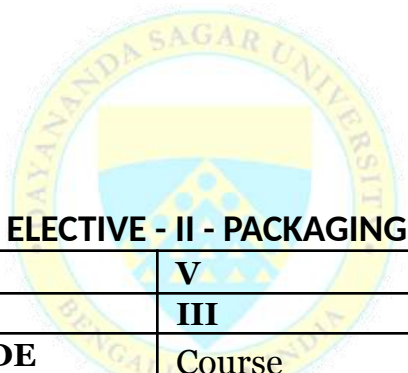
Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES:

- Understand the relationship between the packaging form and function.
- Develop understanding for the defined target groups behaviour and needs.
- Justify and define key performance indicators from strategic goals
- Design a visual concept that will communicate effectively in different formats
- Assess the challenges and opportunities associated with the launch of new products.
- Develop knowledge and awareness of environmental considerations and consequences in relation to the design of packaging.

COURSE OUTCOMES:

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Defines principles of design and Product management with its processes.	L1
CO2	Identifies project management concepts and methods commonly used in design and be able to apply them.	L3
CO3	Plan design strategies for complex processes for integrated design teams.	L3
CO4	Determine balance between time, cost, quality in design management.	L5
CO5	Analyze risks in design and building/construction processes	L4



DAYANANDA SAGAR
UNIVERSITY

PROFESSIONAL ELECTIVE - II - PACKAGING AND BRANDING

SEMESTER	V					
YEAR	III					
COURSE CODE	Course					
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE - II - PACKAGING AND BRANDING					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	-	52	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES:

- Understand the relationship between the packaging form and function.
- Develop understanding for the defined target groups behaviour and needs.
- Justify and define key performance indicators from strategic goals
- Design a visual concept that will communicate effectively in different formats
- Assess the challenges and opportunities associated with the launch of new products.
- Develop knowledge and awareness of environmental considerations and consequences in relation to the design of packaging.

COURSE OUTCOMES:

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Classify the strategic elements of product development	L2
CO2	Develop understanding for the defined target groups behaviour and needs.	L6
CO3	Understand the relationship between the packaging form and function.	L2
CO4	Assess the challenges and opportunities associated with the launch of new products.	L5
CO5	Develop knowledge and awareness of environmental considerations and consequences in relation to the design of packaging.	L6

PROFESSIONAL ELECTIVE - III - DESIGN SIMULATION AND ANALYSIS

SEMESTER	V					
YEAR	III					
COURSE CODE						
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE - III - DESIGN SIMULATION AND ANALYSIS					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	-	52	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course
			Probability and Statistics
			Matrix Algebra

COURSE OBJECTIVES :
<ul style="list-style-type: none">• Understand the principles and concepts of simulation in

design

<ul style="list-style-type: none"> • Evaluate various simulation techniques and their applicability
<ul style="list-style-type: none"> • Create and develop models suitable for design simulation
<ul style="list-style-type: none"> • Analyze and interpret simulation results critically
<ul style="list-style-type: none"> • Effectively communicate findings from simulations

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Apply principles of simulation and analysis in design	L3
CO2	Analyze and evaluate designs with different simulation techniques	L4
CO3	Design models for simulation and analysis purposes	L4
CO4	Critically assess the results obtained from simulations	L5
CO5	Communicate effectively using simulation results	L3

PROFESSIONAL ELECTIVE - III - INTERIOR DESIGN

SEMESTER	V					
YEAR	III					
COURSE CODE						
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE - III - INTERIOR DESIGN					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	-	52	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :
<ul style="list-style-type: none"> • Learn Interiors & Interior Designs Importance, History (Global & Indian) & Scope.
<ul style="list-style-type: none"> • Identify Design Principles and styles used in Interior Design
<ul style="list-style-type: none"> • Elaborate on the Interiors and Building Services.

- Utilize Modern Trends in Planning & Designing Interiors of various Utilities
- Practical project of Interior Design Small Scale like Study Table/Book Rack or Room.

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Categorize the History and Scope of Interior Design.	L2
CO2	Recognize the Interior Design Principles & Styles.	L1
CO3	Illustrate the integration of interiors and Services.	L2
CO4	Enlist the Current Trends of Interior Design	L5
CO5	Take up & Execute Interior Design Projects	L5



DAYANANDA SAGAR
UNIVERSITY

SYLLABUS SEMESTER VI

For Product Design

INTRODUCTION TO DESIGN RESEARCH

SEMESTER	VI
YEAR	III
COURSE CODE	
TITLE OF THE COURSE	INTRODUCTION TO DESIGN RESEARCH

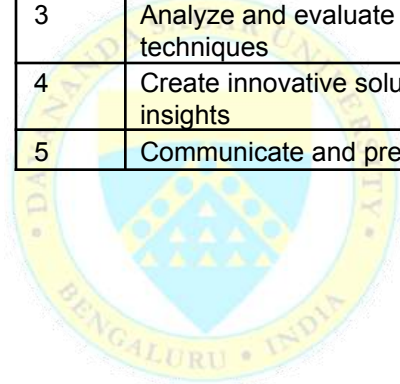
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	2	78	4

#, Sem/Year, Course Code, Title of the Course			

Course Objectives
<ul style="list-style-type: none"> Understand fundamental concepts and principles in design research
<ul style="list-style-type: none"> Apply various design research methodologies in specific contexts

<ul style="list-style-type: none"> • Critically evaluate and compare different design research techniques
<ul style="list-style-type: none"> • Synthesize research findings to generate innovative design solutions
<ul style="list-style-type: none"> • Effectively communicate and present design research outcomes

CO No.	Course Outcomes	Bloom's Taxonomy Levels
1	Demonstrate comprehension of foundational design research concepts	L1
2	Apply diverse design research methodologies in practical scenarios	L2
3	Analyze and evaluate the effectiveness of design research techniques	L3
4	Create innovative solutions by synthesizing design research insights	L4
5	Communicate and present design research findings effectively	L5



DAYANANDA SAGAR
UNIVERSITY

MINI PROJECT-V-DESIGN FOR SUSTAINABILITY

SEMESTER	VI
YEAR	III
COURSE CODE	
TITLE OF THE COURSE	MINI PROJECT-V-DESIGN FOR SUSTAINABILITY

SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	2	78	4

#	Sem/Year	Course Code	Title of the Course

Course Objectives
To introduce the fundamental principles of sustainable design
To enable students to implement sustainable design strategies in practical projects
To assess and analyze the environmental implications of design decisions
To develop communication skills in presenting and defending sustainable design solutions
To foster collaborative skills for working in diverse sustainability-focused teams

Course Outcomes:

CO No.	Course Outcomes	Bloom's Taxonomy Levels
1	Understand the principles of sustainable design	L2
2	Apply sustainable design strategies in projects	L4
3	Evaluate the environmental impact of design choices	L4
4	Communicate and justify sustainable design solutions	L5
5	Collaborate effectively in multidisciplinary sustainability projects	L5

PROFESSIONAL ELECTIVE-IV- AR AND VR TECHNOLOGIES IN DESIGN

SEMESTER	VI
YEAR	III
COURSE CODE	PLACEHOLDER(23BD1101)
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE - IV - AR AND VR TECHNOLOGIES IN DESIGN

SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	2	-	65	4

#	Sem/Year	Course Code	Title of the Course

Course Objectives
Understand the principles and components of AR and VR technologies.
Apply AR and VR tools to create immersive design experiences.
Critically analyze case studies to assess the impact of AR and VR in design.
Develop practical skills in using AR and VR software for design purposes.
Evaluate and discuss ethical considerations in the use of AR and VR in design contexts.

Course Outcomes:

CO No.	Course Outcomes	Bloom's Taxonomy Levels
1	Understand the fundamentals of Augmented Reality (AR) and Virtual Reality (VR) technologies.	L2
2	Apply AR and VR technologies in the context of design and creation.	L3
3	Analyze the impact of AR and VR on design processes and user experiences.	L4
4	Develop proficiency in using AR and VR tools for design and visualization.	L4



DAYANANDA SAGAR
UNIVERSITY

SEMESTER	VI
YEAR	III
COURSE CODE	PLACEHOLDER(23BD1101)
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE-IV- TECHNICALLY COMPLEX PRODUCTS

SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	2	-	65	4

#	Sem/Year	Course Code	Title of the Course

Course Objectives
Understand and apply design thinking principles in complex product development
Analyze and synthesize technical requirements for diverse product functionalities
Generate innovative and feasible solutions for intricate technical challenges in design
Effectively communicate complex design concepts through various mediums
Collaborate efficiently within multidisciplinary teams for successful product design

CO No.	Course Outcomes	Bloom's Taxonomy Levels
1	Apply design thinking methodologies to complex product development	L3
2	Analyze and synthesize diverse technical requirements for product design	L4
3	Create innovative solutions for technically intricate product challenges	L5
4	Communicate complex design concepts effectively	L4
5	Collaborate proficiently within multidisciplinary teams for product design	L5

PROFESSIONAL ELECTIVE-V- PRODUCT LIFE CYCLE AND MANAGEMENT

SEMESTER	VI
----------	----

YEAR	III
COURSE CODE	PLACEHOLDER(23BD1101)
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE-V- PRODUCT LIFE CYCLE AND MANAGEMENT

SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	2	-	65	4

#	Sem/Year	Course Code	Title of the Course

Course Objectives
Identify and describe the distinct stages of the product life cycle.
Develop strategies specific to each stage of the product life cycle.
Analyze and apply product management techniques to extend product life cycles.
Design marketing plans aligned with the varying demands of product life cycle stages.
Evaluate case studies to extract lessons on effective and ineffective life cycle management.

CO No.	Course Outcomes	Bloom's Taxonomy Levels
1	Understand the stages of the product life cycle and their implications for business strategy.	L2
2	Analyze different product strategies for each stage of the product life cycle.	L3
3	Evaluate the importance of product management in sustaining a product's life cycle.	L4
4	Apply marketing techniques tailored to different stages of the product life cycle.	L4
5	Critically assess case studies of product successes and failures in relation to life cycle management.	L5

PROFESSIONAL ELECTIVE-V-AI APPLICATIONS IN DESIGN

SEMESTER	VI
YEAR	III
COURSE CODE	PLACEHOLDER(23BD1101)
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE-V-AI APPLICATIONS IN DESIGN

SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
-----------------------	---------------	----------------	-----------------	------------------------	-------------	---------

	3	-	2	-	65	4
--	---	---	---	---	----	---

#	Sem/Year	Course Code	Title of the Course

Course Objectives
Introduce foundational concepts of AI in design.
Explore and compare different AI tools applicable to design tasks.
Implement AI algorithms for design optimization and creativity.
Analyze ethical considerations associated with AI implementation in design.
Utilize AI technologies to create innovative design solutions.

CO No.	Course Outcomes	Bloom's Taxonomy Levels
1	Understand the fundamentals of AI in design applications.	L2
2	Analyze and evaluate various AI tools and techniques used in design.	L3
3	Apply AI algorithms to solve design-related problems.	L4
4	Critically assess the ethical implications of AI in design.	L5
5	Develop innovative design solutions using AI technologies.	L4

PROFESSIONAL ELECTIVE-V- DESIGN FOR ASSEMBLY AND DISASSEMBLY

SEMESTER	
YEAR	
COURSE CODE	PLACEHOLDER(23BD1101)
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE-V- DESIGN FOR ASSEMBLY AND DISASSEMBLY

SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	2	-	65	4

#	Sem/Year	Course Code	Title of the Course

Course Objectives
To comprehend the fundamental concepts and principles of DFA
To assess and critique existing products for their assembly and disassembly complexities
To employ DFA techniques to enhance product design and streamline assembly processes
To integrate sustainability considerations in product design through DFA
To create strategies for implementing efficient assembly and disassembly practices

CO No.	Course Outcomes	Bloom's Taxonomy Levels
1	Understand the principles of Design for Assembly (DFA)	L2
2	Analyze and evaluate products for their assembly and disassembly processes	L3
3	Apply DFA methodologies to optimize product designs	L4
4	Design products considering environmental impacts and lifecycle aspects	L5
5	Develop solutions for efficient assembly and disassembly operations	L4

PROFESSIONAL ELECTIVE-V- ADVANCED SCULPTING

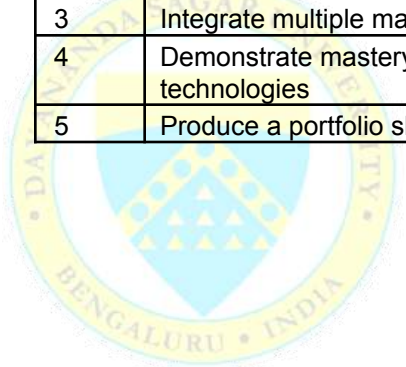
SEMESTER	VI
YEAR	III
COURSE CODE	PLACEHOLDER(23BD1101)
TITLE OF THE COURSE	PROFESSIONAL ELECTIVE-V- ADVANCED SCULPTING

SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	2	-	65	4

#	Sem/Year	Course Code	Title of the Course

Course Objectives
Develop proficiency in advanced sculpting methods
Analyze and assess advanced sculpting projects for refinement
Experiment with diverse materials to expand sculpting capabilities
Master the use of cutting-edge sculpting software and tools
Create a professional portfolio demonstrating expertise in advanced sculpting

CO No.	Course Outcomes	Bloom's Taxonomy Levels
1	Apply advanced sculpting techniques to create complex forms	L4
2	Evaluate and critique advanced sculpting work	L5
3	Integrate multiple materials in advanced sculpting projects	L3
4	Demonstrate mastery of advanced sculpting tools and technologies	L4
5	Produce a portfolio showcasing advanced sculpting skills	L6



DAYANANDA SAGAR
UNIVERSITY

DAYANANDA SAGAR UNIVERSITY

Hosur Rd, kudlu gate, srinivasa nagar, HAL layout, singasandra, Bengaluru, Karnataka 560068



SCHOOL OF DESIGN AND DIGITAL TRANSMEDIA

2022 Batch – 3rd and 4th Semester

BACHELOR OF DESIGN

SYLLABUS

SEMESTER III

For Product and User Experience Design

COMPUTER AIDED DESIGN

SEMESTER	III					
YEAR	II					
COURSE CODE	Course 231					
TITLE OF THE COURSE	COMPUTER AIDED DESIGN					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	2	-	65	4

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

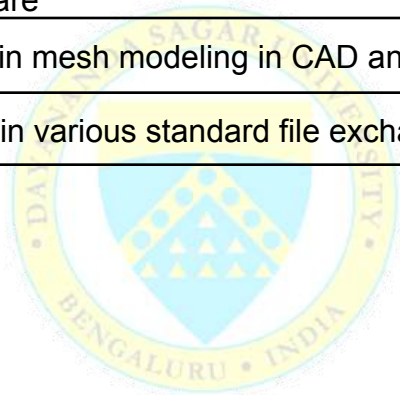
COURSE OBJECTIVES :

- To learn about applications of various kinds of curves and understand how curves are modeled in computer aided software
- To learn about applications of various kinds of solid modeling approaches in CAD and understand the same
- To learn about applications of various surface modeling approaches in CAD
- To learn about applications of mesh-based approaches in CAD

- To learn about standard file exchange formats in CAD

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Explain various kinds of curves in CAD and apply it in CAD software	L2
CO2	Explain various kinds of solids and their modeling in in CAD and apply it in CAD software	L3
CO3	Explain various kinds of surfaces and their modeling in in CAD and apply it in CAD software	L3
CO4	Explain mesh modeling in CAD and apply it in CAD software	L3
CO5	Explain various standard file exchange formats in CAD	L2



DATTATRAYA NANDA SAGAR
UNIVERSITY

TREND ANALYSIS AND FORECASTING

SEMESTER	III					
YEAR	II					
COURSE CODE	Course 232					
TITLE OF THE COURSE	TREND ANALYSIS AND FORECASTING					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :

- To learn about applications New Product Analysis and Trends
- To learn about Predictions and future trends in design and marketing.
- To learn about applications of image classification for trend identification.
- To learn about forecasting methods using machine learning.
- To learn about modelling data and data mining.

COURSE OUTCOMES :

CO No.	Course Outcomes	Bloom's Taxonomy Level
CO1	Illustrate various kinds of approaches to trend analysis	L2
CO2	Apply and describe predictions and future trends	L3
CO3	Examine applications of image classification.	L4

CO4	Evaluate forecasting methods using ML	L5
CO5	Discuss data mining, modelling, and analysis.	L6



DAYANANDA SAGAR
UNIVERSITY

ERGONOMICS-I

SEMESTER	III
YEAR	II

COURSE CODE	Course 233					
TITLE OF THE COURSE	ERGONOMICS-I					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	-	52	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :

- To understand and appreciate the role of user centricity in design process
- To calculate product dimensions for user population
- To predict the influence of products on user wellbeing

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	To measure anthropometric dimensions	L1
CO2	To visualize the interactions between the user and product	L3
CO3	To suggest improvements in products and spaces to reduce health hazards	L2
CO4	Identify key ergonomic principles related to human anatomy and design.	L2
CO5	Explain human capabilities and limitations influencing product usability and comfort.	L3

1.



DAYANANDA SAGAR
UNIVERSITY

PHOTOGRAPHY AND VIDEOGRAPHY

SEMESTER	III
YEAR	II
COURSE CODE	Course 234
TITLE OF THE COURSE	PHOTOGRAPHY AND VIDEOGRAPHY

SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	4	-	78	4

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course
1.			

COURSE OBJECTIVES:

- To build equipment familiarity and impart basic skills in photography
- To build equipment familiarity and impart basic skills in videography
- To develop familiarity and impart basic skills in video-editing

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Explain how camera works and use it	L2
CO2	Explain how to photograph in different scenarios like nature photography, photography for product marketing and illustrate it.	L3
CO3	Explain how to light the subjects with flash and natural lighting and illustrate it.	L3
CO4	Explain how to compose images using photography rules and illustrate it.	L3
CO5	Explain basic concepts of videography and illustrate it	L3



DAYANANDA SAGAR
UNIVERSITY

DESIGN STUDIO I - MINI PROJECT-II

SEMESTER	III					
YEAR	II					
COURSE CODE	Course 235					
TITLE OF THE COURSE	DESIGN STUDIO I - MINI PROJECT-II					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	1	-	6	-	91	4

--	--	--	--	--	--	--

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :

- To understand the process of design and be able to find solutions to simple problems.
- To identify problems and find needs.
- To understand the problem solving process
- To analyze the problem through different methods
- To arrive at alternate design concepts

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	To elaborate on the process of design and be able to find solutions to simple problems.	L2
CO2	To identify problems and find needs.	L1
CO3	To elaborate and use the problem-solving process	L2
CO4	To analyze the problem through different methods	L5
CO5	To arrive at alternate design concepts	L5



DAYANANDA SAGAR UNIVERSITY

ENGINEERING BASICS

SEMESTER	III					
YEAR	II					
COURSE CODE	Course 236					
TITLE OF THE COURSE	ENGINEERING BASICS					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	-	-	39	3

Pre-requisite Courses (if any)

#	Sem/Year	Course Code	Title of the Course
---	----------	-------------	---------------------

COURSE OBJECTIVES :

- Define the fundamental dimensions of Length, Mass, Time, Electric Current, Thermodynamic Temperature, Amount of Substance, and Luminous Intensity to enable categorization of physical quantities.
- Describe the parameters associated with Length, Mass, Time, Electric Current, Force, Energy, and Power, facilitating proficient execution of conversion techniques between units within each parameter.
- Introduce students to mechanical engineering principles, stress and strain analysis, and the fundamentals of thermodynamics to enable the theoretical understanding of basic concepts in mechanical engineering.
- Familiarize students with the basic concepts of electrical engineering, including charge, electric current, voltage, resistors, and circuit laws, fostering comprehension and application of electricity, Ohm's Law, and Kirchoff's Law.
- Introduce students to fundamental concepts in electronics engineering, such as semiconductors, diodes, and transistors, enabling the articulation of the functionalities of semiconductor devices like diodes and transistors.

COURSE OUTCOMES :

CO No.	Course Outcomes	Bloom's Taxonomy Level
CO1	Categorize physical quantities based on their fundamental dimensions.	L2
CO2	Execute conversion techniques proficiently between diverse units of measurement within each parameter.	L3
CO3	Articulate the basic concepts of mechanical engineering principles.	L3
CO4	Demonstrate comprehension of electricity, Ohm's Law and Kirchoff's Law.	L3
CO5	Articulate the functionalities of semiconductor devices such as diodes and transistors.	L2



DAYANANDA SAGAR

SYLLABUS SEMESTER IV

For Product and User Experience Design

DESIGN SKETCHING-II

SEMESTER	IV					
YEAR	II					
COURSE CODE	Course 241					
TITLE OF THE COURSE	DESIGN SKETCHING-II					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	2	-	65	4

--	--	--	--	--	--	--

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :

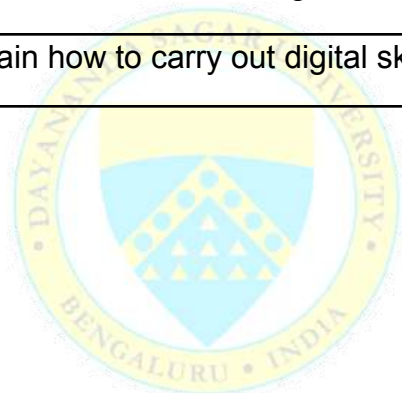
- To represent the ideas and concepts using sketches
- To be able to create mimetic images
- To be able explain images and their expressions
- To be able to manipulate images
- To be able to carry out digital sketching



DAYANANDA SAGAR
UNIVERSITY

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Explain how to represent the ideas and concepts using sketches and illustrate the same.	L1
CO2	Explain how to create mimetic images.	L3
CO3	Explain images and their expressions.	L1
CO4	Explain and illustrate image manipulation.	L3
CO5	Explain how to carry out digital sketching and illustrate it.	L3



DAYANANDA SAGAR
UNIVERSITY

MATERIAL EXPLORATION-I

SEMESTER	IV
YEAR	II

COURSE CODE	Course 242					
TITLE OF THE COURSE	MATERIAL EXPLORATION-I					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	0	-	52	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course
1.			

COURSE OBJECTIVES :

- Understand the life cycle of materials and how it relates to sustainability issues
- Understand materials and its role in engineering and design
- Understand properties that are important in engineering and design
- Learn materials from manufacturing perspective
- Learn selection criteria used in design

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Explain the life cycle of the materials and related sustainability issues.	L1
CO2	Explain how materials are used in engineering.	L1

CO3	Explain various kinds of metals, their properties, uses and design applications.	L1
CO4	Explain various kinds of metals, their processing methods and how it affects designs.	L3
CO5	Explain how to select materials and illustrate it.	L1



DAYANANDA SAGAR
UNIVERSITY

ELEMENTS OF DESIGN-II

SEMESTER	IV					
YEAR	II					
COURSE CODE	Course 243					
TITLE OF THE COURSE	ELEMENTS OF DESIGN-II					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	2	-	65	4

--	--	--	--	--	--	--

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :

- Understand about forms and their relation to function and utilize them in design
- Understand the principles of space and utilize them in design
- Understand the principles of texture and utilize them in design
- Understand about aesthetics in design
- Understand the principles of beauty during design

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Elaborate about the importance of form and their relation to function in design	L1
CO2	Elaborate the principles of space and illustrate them with designs	L3
CO3	Elaborate the principles of texture and illustrate them in designs	L3
CO4	Elaborate about aesthetics in design	L1
CO5	Elaborate about the principles of beauty during design	L1



DAYANANDA SAGAR
UNIVERSITY

IDEATION METHODS IN DESIGN

SEMESTER	IV					
YEAR	II					
COURSE CODE	Course 245					
TITLE OF THE COURSE	IDEATION METHODS IN DESIGN					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	3	-	2	-	65	4

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :

- Promote divergent thinking
- Appreciate the role of design methods in creative ideation
- Appreciate the role of creativity in design

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Apply design methods to generate ideas	L3
CO2	Select appropriate design method for specific tasks	L4
CO3	Generate novel design solutions	L3
CO4	Explain the importance of brainstorming in creative problem solving.	L2
CO5	Differentiate between divergent and convergent thinking in ideation	L3



DAYANANDA SAGAR
UNIVERSITY

DESIGN STUDIO II - MINI-PROJECT-III

SEMESTER	IV					
YEAR	II					
COURSE CODE	Course 246					
TITLE OF THE COURSE	DESIGN STUDIO II - MINI-PROJECT-III					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	4	-	78	4

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

1.			

COURSE OBJECTIVES :

- To understand creative thinking
- To develop ideas for various problems
- To generate several alternate solutions
- To model and visualize ideas and concepts generated
- To prototype ideas and concepts

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Elaborate on creative thinking	L1
CO2	Develop ideas for various problems	L3
CO3	Generate several solutions and evaluate, select based on criteria	L3
CO4	Model and visualize ideas and concepts generated	L5
CO5	Prototype ideas and concepts	L6



DAYANANDA SAGAR
For Product Design
UNIVERSITY

ERGONOMICS-II

SEMESTER	IV					
YEAR	II					
COURSE CODE	Course 244					
TITLE OF THE COURSE	ERGONOMICS-II					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	2	78	4

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

1.			

COURSE OBJECTIVES:

- To understand the central concepts in controls and display
- Appreciate the role of design in product safety
- Create GUIs that based on implicit and explicit user needs

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Analyze controls and displays from design perspective	L4
CO2	Apply the concepts of human machine / computer interaction to minimize human error	L3
CO3	Propose GUIs for a specific user group	L3
CO4	Evaluate ergonomic solutions through testing and user feedback integration.	L3
CO5	Create innovative ergonomic designs that enhance comfort and functionality	L4

For User Experience Design

SEMESTER	IV
YEAR	II
COURSE CODE	
TITLE OF THE COURSE	PRINCIPLES OF VISUAL DESIGN

SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	2	78	4

#	Sem/Year	Course Code	Title of the Course

Course Objectives
Identify and describe the fundamental elements of visual design.
Critique and compare visual design choices across different media.
Create visual compositions applying design principles through hands-on projects.
Evaluate the effectiveness of visual design in achieving communication goals.
Utilize design software/tools to implement visual design concepts.

CO No.	Course Outcomes	Bloom's Taxonomy Levels
1	Understand the elements of visual design and their significance in communication.	L2
2	Analyze and evaluate the application of visual design principles in various media.	L4
3	Apply visual design principles effectively in practical design projects.	L3

4	Critically assess the impact of visual design on user experience and audience perception.	L5
5	Demonstrate proficiency in using design tools to implement visual design concepts.	L3



DAYANANDA SAGAR
UNIVERSITY

DAYANANDA SAGAR UNIVERSITY

Hosur Rd, kudlu gate, srinivasa nagar, HAL layout, singasandra, Bengaluru, Karnataka 560068



SCHOOL OF DESIGN AND DIGITAL TRANSMEDIA

2023 Batch – 1st and 2nd Semester

BACHELOR OF DESIGN

SYLLABU S SEMESTE R I

SEMESTER	I					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	INTRODUCTION TO DESIGN					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Project s Hours	Total Hours	Credits
	2	-	2	-	48	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

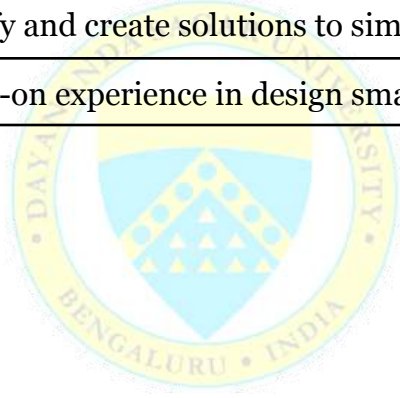
COURSE OBJECTIVES:

- To introduce the history of the design process
- To introduce the design philosophy, various definitions and facets of design, design process, design thinking, creativity and innovation

- To discuss design education, different domains of design
- To introduce to global, environmental, and cultural issues related to design and the ethical, legal considerations while practicing design
- To be able to apply and understand some of the design methods to create ideas and concepts

COURSE OUTCOMES:

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Get a broad view of design, Understand various definitions of design	L2
CO2	Appreciate the role of design in various domains, be aware of various schools of thought in design	L1
CO3	Understand the various design stages, Understand the implications of design decisions	L2
CO4	Identify and create solutions to simple needs and problems	L5
CO5	Hands-on experience in design small products	L5



DAYANANDA SAGAR
UNIVERSITY

SEMESTER	I					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	DESIGN PRINCIPLES					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Project Hours	Total Hours	Credits
	3	-	2	-	60	4

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :

To understand central concepts and methods in the interaction design field
 To relate these central concepts and methods to cognitive science field

To develop the cognitive perspective, analyze user experience.

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Elaborate central principles in the design field	L2
CO2	Create aesthetically appealing and easy-to-use design solutions	L3
CO3	Develop the cognitive perspective to designing	L6
CO4	Analyze the use of design elements and principles in existing products	L4

CO5	Apply design principles to create visually balanced and aesthetically pleasing compositions in 2D and 3D media.	L3
-----	---	----



DAYANANDA SAGAR
UNIVERSITY

SEMESTER	I
YEAR	I

COURSE CODE						
TITLE OF THE COURSE	FOUNDATION OF ART AND DESIGN-I					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Project Hours	Total Hours	Credits
	2	-	4	-	72	4

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :
<ul style="list-style-type: none"> To be able to understand and explain the basic elements of design
<ul style="list-style-type: none"> To be able to represent and use lines for different expressions
<ul style="list-style-type: none"> To be able to use and apply various principles of visual composition and visual relationships
<ul style="list-style-type: none"> To understand and use colors for designing
<ul style="list-style-type: none"> To understand and create forms for designing

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	State the importance of basic elements of design	L1
CO2	Explore lines to represent different expressions and use lines to represent different expressions	L2
CO3	Illustrate and use various principles of visual composition and visual relationships	L3

CO 4	Illustrate the importance of colors in design and use colors for designing	L1
---------	--	----

CO5

Illustrate the importance of forms in design and create forms for designing

L6



DAYANANDA SAGAR
UNIVERSITY

SEMESTER	I					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	Fundamentals of Programming					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	-	52	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES:
<ul style="list-style-type: none"> To understand what is programming and to use the same to solve real-world problems
<ul style="list-style-type: none"> To understand and develop programs to carry out decision making and branching and repetitive tasks using programs
<ul style="list-style-type: none"> To understand and develop memory allocation and functions in programming
<ul style="list-style-type: none"> To be able to use modules for various basic operations in scripting
<ul style="list-style-type: none"> To be able to use scripting to develop quick prototypes

COURSE OUTCOMES :

CO No.	Course Outcomes	Bloom's Taxonomy Levels
CO1	Apply programming concepts to address real-world problems.	L2
CO2	Create programs for decision-making and execute iterative and branching tasks through a comprehensive grasp of programming principles.	L3

CO3	Construct functions and manage memory allocation within programming by demonstrating a comprehensive understanding and the ability to develop.	L3
CO4	Apply Python scripting modules to perform a range of basic operations.	L3
CO5	Create rapid prototypes by applying Python scripting skills.	L5



DAYANANDA SAGAR
UNIVERSITY

SEMESTER	I
YEAR	I
COURSE CODE	
TITLE OF THE COURSE	DESIGN SKETCHING-I

SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Project Hours	Total Hours	Credits
	2		4	-	72	4

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :
Practice object drawing fundamentals Practice one point perspective, two-point perspective and three-point perspective Draw and illustrate sketches of ideas in one point perspective, two-point perspective and three-point perspective

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Explain object drawing fundamentals	L1
CO2	Sketch in one-point perspective	L3
CO3	Sketch in Two-point perspective	L3
CO4	Sketch in Three-point perspective	L3
CO5	Sketch in nature drawings	L3



DAYANANDA SAGAR UNIVERSITY

SEMESTER	I					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	TECHNICAL ENGLISH					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	1	-		-	12	1

Pre-requisite Courses (if any)

#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :

- To enhance their communicative skills
- To equip students with oral and appropriate written communication skills
- To inculcate students with employability and job search skills
- To achieve proficiency in English
- To create interest among the students about any topic
- To learn the use of body language and improve verbal message To acquire skills for placement
- To help them frame their ideas and thoughts in a proper manner

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Make a complete Group Project: Poster Making, PowerPoint Presentation, Abstract Writing, Project Paper, Facing Viva	L2
CO2	Skit Performance on any social awareness theme in group.	L2
CO3	Learning how to create a Cover Letter, Job Application and Resume.	L3
CO4	Analyze technical documents, design briefs, and research materials to extract relevant information for design projects.	L2
CO5	Demonstrate effective verbal and written communication skills tailored to diverse audiences in design-related scenarios.	L4



DAYANANDA SAGAR UNIVERSITY

SEMESTER	I					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	KANNADA KALI					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	1	-	-	-	12	1

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

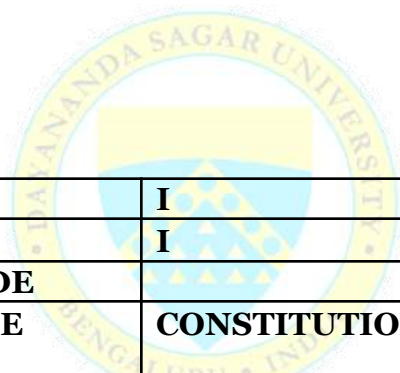
COURSE OBJECTIVES :

To introduce Kannada language & culture to Non - Kannada speakers.

To train them to communicate in colloquial Kannada with connivance

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Learners can communicate in Kannada	L3
CO2	Learners can acquaint themselves with Kannada culture	L3
CO3	Recall basic Kannada words and phrases for communication.	L3
CO4	Understand sentence formation for everyday conversations in Kannada.	L4
CO5	Explain Kannada cultural practices through simple oral presentations	L2



DAYANANDA SAGAR UNIVERSITY

SEMESTER	I					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	CONSTITUTION OF INDIA					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	1	-	-	-	12	1

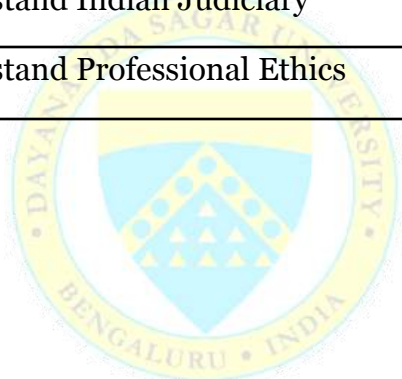
Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course
	--	--	--

COURSE OBJECTIVES :
<ul style="list-style-type: none">To familiarize students with various aspects of Constitution of India

- To familiarize students with various aspects of Professional ethics

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Have general knowledge and legal literacy about Indian Constitution and there by it helps to take up competitive examinations & to manage/face complex societal issues in society	L1
CO2	Understand state and central policies (Union and State Executive), fundamental Rights & their duties	L2
CO3	Understand the Electoral Process and special provisions in the Constitution.	L2
CO4	Understand Indian Judiciary	L2
CO5	Understand Professional Ethics	L2



DAYANANDA SAGAR
UNIVERSITY

SYLLABUS

SEMESTE

R II

SEMESTER	II/I					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	DESIGN COMMUNICATION					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Project s Hours	Total Hour s	Credits
	2	-	2	-	48	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course
	--	--	--

COURSE OBJECTIVES :
<ul style="list-style-type: none"> ● Analyse and apply fundamental principles of graphic design to effectively communicate messages visually. ● To understand the concepts of orthographic and isometric projections ● To construct orthographic projection of points, lines, planes and solids ● To construct isometric projections of planes and solids ● Communicate effectively with clients, manage design projects, and present work professionally.

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
-------------------	-----------------	-----------------------------------

CO1	Identify and explain key elements and principles of graphic design, such as balance, contrast, and alignment.	L1
CO2	Construct points, lines, planes and solids using orthographic projections principles	L5
CO3	Construct geometries of planes and solids using isometric projection principles	L4
CO4	Construct points, lines, drawings using AutoCAD	L3
CO5	Demonstrate effective communication and project management skills in a simulated design project scenario.	L4



DAYANANDA SAGAR
UNIVERSITY

YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	MINI PROJECT I					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Project Hours	Total Hours	Credits
	2	-	4	-	72	4

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :
<ul style="list-style-type: none"> To familiarize students with task clarification stage
<ul style="list-style-type: none"> To familiarize students with ideation stage
<ul style="list-style-type: none"> To familiarize students with concept generation stage
<ul style="list-style-type: none"> To develop of table top models and prototyping of concepts
<ul style="list-style-type: none"> To evaluate the solutions generated during design process

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Identify the requirements	L3
CO2	Formulate design problem	L6
CO3	Use design methods for creation of new ideas	L6

CO4	Creation of concepts and low fidelity prototypes	L6
CO5	Evaluation of concepts for selection	L5



DAYANANDA SAGAR
UNIVERSITY

SEMESTER	II					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	MINI PROJECT II					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Project Hours	Total Hours	Credits

	2	-	4	-	72	4
--	----------	---	----------	---	-----------	----------

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :
To familiarize students with experience design and its application
To familiarize students with activities of experience design
To use various methods for creation of ideas and concepts in experience design
To create simple applications
To evaluate simple applications

COURSE OUTCOMES :		
CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Elaborate various applications of experience design	L1
CO2	Identifying different activities in various stages of experience design	L3
CO3	Use design methods in experience design to create ideas	L6
CO4	Create front-ends of simple applications	L6
CO5	Use various methods of testing for evaluation	L5



DAYANANDA SAGAR UNIVERSITY

SEMESTER	II/I					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	NEED IDENTIFICATION AND ANALYSIS					
SCHEME OF Instruction	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	-	48	3

Pre-requisite Courses (if any)

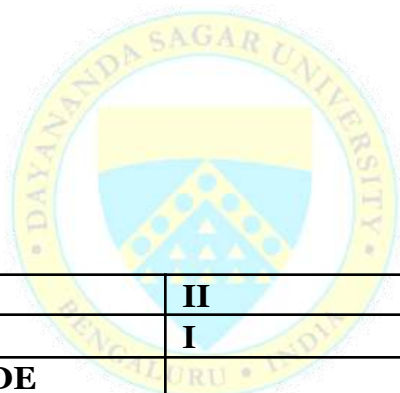
#	Sem/Year	Course Code	Title of the Course
---	----------	-------------	---------------------

COURSE OBJECTIVES :

- To provide an early introduction to methods of soliciting opinion from customers or users that will be required for a design learner to know going further
- To learn various methods available for collection of data and needs
- To understand which methods to use in various situations

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Explore different ways of questioning for seeking opinion from people	L1
CO2	Identify pros and cons of using different ways of questioning for seeking opinion	L3
CO3	Explain and choose different question types particular to the research type at hand	L2
CO4	Identify gaps by interpreting market trends and user preferences.	L2
CO5	Formulate problem statements reflecting user requirements and design challenges.	L3



DAYANANDA SAGAR UNIVERSITY

SEMESTER	II					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	DESIGN SKETCHING-II					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	-	48	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :

- To represent the ideas and concepts using sketches
- To be able to create mimetic images
- To be able explain images and their expressions
- To be able to manipulate images
- To be able to carry out digital sketching

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Explain how to represent the ideas and concepts using sketches and illustrate the same.	L1
CO2	Explain how to create mimetic images.	L3
CO3	Explain images and their expressions.	L1
CO4	Explain and illustrate image manipulation.	L3
CO5	Explain how to carry out digital sketching and illustrate it.	L3

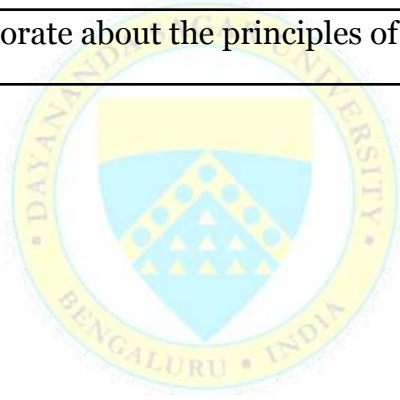
SEMESTER	II					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	FOUNDATIONS IN ART AND DESIGN - II					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Projects Hours	Total Hours	Credits
	2	-	2	-	48	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course

COURSE OBJECTIVES :
<ul style="list-style-type: none"> • Understand about forms and their relation to function and utilize them in design • Understand the principles of space and utilize them in design • Understand the principles of texture and utilize them in design • Understand about aesthetics in design • Understand the principles of beauty during design

COURSE OUTCOMES :

CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Elaborate about the importance of form and their relation to function in design	L1
CO2	Elaborate the principles of space and illustrate them with designs	L3
CO3	Elaborate the principles of texture and illustrate them in designs	L3
CO4	Elaborate about aesthetics in design	L1
CO5	Elaborate about the principles of beauty during design	L1



DAYANANDA SAGAR
UNIVERSITY

SEMESTER	II					
YEAR	I					
COURSE CODE						
TITLE OF THE COURSE	PHOTOGRAPHY AND VIDEOGRAPHY					
SCHEME OF INSTRUCTION	Lecture Hours	Tutorial Hours	Practical Hours	Seminar/Project s Hours	Total Hour s	Credits
	2	-	2	-	48	3

Pre-requisite Courses (if any)			
#	Sem/Year	Course Code	Title of the Course
1.			

COURSE OBJECTIVES:
<ul style="list-style-type: none"> To build equipment familiarity and impart basic skills in photography
<ul style="list-style-type: none"> To build equipment familiarity and impart basic skills in videography
<ul style="list-style-type: none"> To develop familiarity and impart basic skills in video-editing


COURSE OUTCOMES :


CO No.	Outcomes	Bloom's Taxonomy Level
CO1	Explain how camera works and use it	L2
CO2	Explain how to photograph in different scenarios like nature photography, photography for product marketing and illustrate it.	L3
CO3	Explain how to light the subjects with flash and natural lighting and illustrate it.	L3
CO4	Explain how to compose images using photography rules and illustrate it.	L3
CO5	Explain basic concepts of videography and illustrate it	L3




DAYANANDA SAGAR
UNIVERSITY

2.6.1

 COLLEGE OF		Dayananda Sagar University, Bengaluru-560078						
I- Sessional Examination December 2023								
Subject: Pathophysiology	Date:	15/12/2023	Program:	Pharm.D	Duration:	10:30-12:00 PM		
Course code: 15PD205	Day :	Friday	Marks:	30	Year:	II		
Draw diagrams wherever necessary								
Long Essay (Answer any one)								
1	What is cell injury, describe in detail various morphological changes involved in their irreversible type.						Marks	CO
2	Classify the various chromosomal disorders and describe in detail about each of them.						10	1
Short Essay (Answer Any Three)								
3	What are various types of mutations?						10	5
4	Differentiate wet gangrene and dry gangrene.						4	5
5	Describe in detail various types of reversible cell injury						4	1
6	Write in detail about irreversible cell injury with morphological and cellular manifestations.						4	1

 COLLEGE OF		Dayananda Sagar University, Bengaluru-560078						
II- Sessional Examination November 2023								
Subject: Pathophysiology	Date:	15/12/2023	Program:	Pharm.D	Duration:	10:30-12:00 PM		
Course code: 15PD205	Day :	Friday	Marks:	30	Year:	II		
Draw diagrams wherever necessary								
Long Essay (Answer any one)								
1	What is cell injury, describe in detail various morphological changes involved in the irreversible cell						Marks	CO
2	Classify the various chromosomal disorders and describe in detail about each of them.						10	1
Short Essay (Answer Any Three)								
3	What are various types of mutations?						10	5
4	Differentiate wet gangrene and dry gangrene.						4	5
5	Describe in detail various types of reversible cell injury						4	1
6	Write in detail about irreversible cell injury with morphological and cellular manifestations.						4	1


 COLLEGE OF		Dayananda Sagar University, Bengaluru-560078						
I- Sessional Examination November 2023								
Subject: Pathophysiology	Date:	15/12/2023	Program:	Pharm.D	Duration:	10:30-12:00 PM		
Course code: 15PD205	Day :	Friday	Marks:	30	Year:	II		
Draw diagrams wherever necessary								
Long Essay (Answer any one)								
1	What is cell injury, describe in detail various morphological changes involved in the irreversible cell injury						Marks	CO
2	Classify the various chromosomal disorders and describe in detail about each of them.						10	1
Short Essay (Answer Any Three)								
3	What are various types of mutations?						10	5
4	Differentiate wet gangrene and dry gangrene.						4	5
5	Describe in detail various types of reversible cell injury						4	1
6	Write in detail about irreversible cell injury with morphological and cellular manifestations.						4	1

Short Answers (Answer All)		Dayananda Sagar University		Marks	CO
-----------------------------------	--	-----------------------------------	--	--------------	-----------

6	Define Virchow's cellular theory of disease.	2	1
7	Define etiology and write atleast five of them	2	1
8	Define Hyperplasia and Hypertrophy	2	1
9	Define Amyloid change and explain its types	2	1

Short Answers (Answer All)		Marks	CO
6	Define Virchow's cellular theory of disease.	2	1
7	Define etiology and write atleast five of them	2	1
8	Define Hyperplasia and Hypertrophy	2	1
9	Define Amyloid change and explain its types	2	1

Short Answers (Answer All)		Marks	CO
6	Define Virchow's cellular theory of disease.	2	1
7	Define etiology and write atleast five of them	2	1
8	Define Hyperplasia and Hypertrophy	2	1
9	Define Amyloid change and explain its types	2	1


PRINCIPAL
 College of Pharmaceutical sciences
 Dayananda Sagar University
 Kumaraswamy Layout,
 Bengaluru - 560 078. /



COLLEGE OF

Dayananda Sagar University, Bengaluru-562112

I- Sessional Examination November 2024

Course: Pharmaceutical Formulations

Course Code: 17BP306

Date: 09-11-2024

Day: Saturday

Program: Pharm D

Marks: 30

Duration: 1hr 30 min

CLASS: III Pharm D

Long Essay (Answer any one)

		Marks	CO
1	Define base adsorption theory and minimum per gram. Explain the rotary die process method.	10	2
2	What are solid dosage form? Enumerate the steps involved in the preparation of granules by dry granulation method.	10	1

Short Essay (Answer Any THREE)

3	Explain the different steps involved in the preparation of empty hard gelatin capsule shells.	4	2
4	Define excipients. Write a note on excipients used in preparation of tablets.	4	1
5	Define dosage form and Classify them with an example.	4	1
6	Annotate the nature of capsule shell.	4	2

Short Answers (Answer All)

		Marks	CO
7	Classify and Define the types of gelatin used in the preparation of Capsules.	2	2
8	Give the difference between Liniments & Lotions.	2	1
9	How the incompatible materials are filled in hard gelatin capsules.	2	2
10	Define a. Sublingual tablets b. Buccal tablets	2	1



COLLEGE OF

Dayananda Sagar University, Bengaluru-562112

I- Sessional Examination November 2024

Course: Pharmaceutical Formulations

Course Code: 17BP306

Date: 09-11-2024

Day: Saturday

Program: Pharm D

Marks: 30

Duration: 1hr 30 min

CLASS: III Pharm D

Long Essay (Answer any one)

		Marks	CO
1	Define base adsorption theory and minimum per gram. Explain the rotary die process method.	10	2
2	What are solid dosage form? Enumerate the steps involved in the preparation of granules by dry granulation method.	10	1


Short Essay (Answer Any THREE)


3	Explain the different steps involved in the preparation of empty hard gelatin capsule shells.	4	2
4	Define excipients. Write a note on excipients used in preparation of tablets.	4	1
5	Define dosage form and Classify them with an example.	4	1
6	Annotate the nature of capsule shell.	4	2

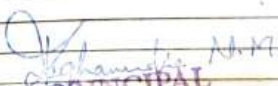
Short Answers (Answer All)

		Marks	CO
7	Classify and Define the types of gelatin used in the preparation of Capsules.	2	2
8	Give the difference between Liniments & Lotions.	2	1
9	How the incompatible materials are filled in hard gelatin capsules.	2	2
10	Define a. Sublingual tablets b. Buccal tablets	2	1

Stephanie M.H.
PRINCIPAL
 College of Pharmaceutical sciences
 Dayananda Sagar University
 Kumaraswamy Layout,
 Bengaluru - 560 078.

 COLLEGE OF		Dayananda Sagar University, Bengaluru-562112				
I- Sessional Examination November 2024						
Course: IMA	Date: 4/11/2024	Program: B. Pharm	Duration:	1.30 hr		
Course code: 17BP701	Day: Monday	Marks: 30	Semester:	7th		
Draw neat labelled diagrams wherever necessary						
Long Essay (Answer any one)				Marks	CO	
1	Define the principle of IR spectroscopy. Draw a neat diagram of IR spectrophotometer and explain its instrumentation.				10	CO2
2	Define the principle of UV-Vis spectroscopy. Draw a neat diagram of UV spectrophotometer and explain its instrumentation.				10	CO1
Short Essay (Answer Any Two)						
3	Compare AAS and AES and Write their applications				5	CO2
4	Explain the instrumentation of flame photometer				5	CO2
5	Explain the principle of nephelometry.				5	CO2
Short Answers (Answer All)				Marks	CO	
6	Fermi resonance				2	CO1
7	Stoke's shift				2	CO1
8	Chromophore				2	CO1
9	Auxochrome				2	CO1
10	Beer's Lambert's law				2	CO1

 COLLEGE OF		Dayananda Sagar University, Bengaluru-562112				
I- Sessional Examination November 2024						
Course: IMA	Date: 4/11/2024	Program: B. Pharm	Duration:	1.30 hr		
Course code: 17BP701	Day: Monday	Marks: 30	Semester:	7th		
Draw neat labelled diagrams wherever necessary						
Long Essay (Answer any one)				Marks	CO	
1	Define the principle of IR spectroscopy. Draw a neat diagram of IR spectrophotometer and explain its instrumentation.				10	CO2
2	Define the principle of UV-Vis spectroscopy. Draw a neat diagram of UV spectrophotometer and explain its instrumentation.				10	CO1
Short Essay (Answer Any Two)						
3	Compare AAS and AES and Write their applications				5	CO2
4	Explain the instrumentation of flame photometer				5	CO2
5	Explain the principle of nephelometry..				5	CO2
Short Answers (Answer All)				Marks	CO	
6	Fermi resonance				2	CO1
7	Stoke's shift				2	CO1
8	Chromophore				2	CO1
9	Auxochrome				2	CO1
10	Beer's Lambert's law				2	CO1


PRINCIPAL
 College of Pharmaceutical sciences
 Dayananda Sagar University
 Kumaraswamy Layout,
 Bengaluru - 560 070.

College of Pharmaceutical Sciences
Dayananda Sagar University, Bengaluru-560078

Subject	NDDS	Date: 03/11/23	Program	B. Pharm	Duration	90 min
Course code	17BP704	Day : Friday	Marks	30	Semester	VII

I- Sessional Examination November 2023

Write chemical structures wherever necessary

		Long Essay (Answer any one)			Marks	CC
1.	Define microencapsulation. Write the advantages and disadvantages of microencapsulation. Explain phase separation-Coacervation technique.				10	2
2.	Describe the various physicochemical and pharmaceutical factors to be considered in selection of a drug candidate for controlled delivery formulations				10	1
		Short Essay (Answer Any Two)				
3.	Explain concept, advantages and disadvantages of implants.				5	2
4.	Explain the approaches required for designing Activation -Modulated controlled drug delivery system.				5	1
5.	Define Polymers and Classify them. Give the applications of polymers in formulation of controlled release drug delivery systems.				5	1

College of Pharmaceutical Sciences
Dayananda Sagar University, Bengaluru-560078

Subject	NDDS	Date: 03/11/23	Program	B. Pharm	Duration	90 min
Course code	17BP704	Day : Friday	Marks	30	Semester	VII

I- Sessional Examination Month /Year

Write chemical structures wherever necessary

		Long Essay (Answer any one)			Marks	CC
1.	Define microencapsulation. Write the advantages and disadvantages of microencapsulation. Explain phase separation-Coacervation technique.				10	2
2.	Describe the various physicochemical and pharmaceutical factors to be considered in selection of a drug candidate for controlled delivery formulations				10	1
		Short Essay (Answer Any Two)				
3.	Explain concept, advantages and disadvantages of implants.				5	2
4.	Explain the approaches required for designing Activation -Modulated controlled drug delivery system.				5	1
5.	Define Polymers and Classify them. Give the applications of polymers in formulation of controlled release drug delivery systems.				5	1


College of Pharmaceutical Sciences
Dayananda Sagar University, Bengaluru-560078

Subject	NDDS	Date: 03/11/23	Program	B. Pharm	Duration	90 min
Course code	17BP704	Day : Friday	Marks	30	Semester	VII

I- Sessional Examination Month /Year

Write chemical structures wherever necessary

		Long Essay (Answer any one)			Marks	CC
1.	Define microencapsulation. Write the advantages and disadvantages of microencapsulation. Explain phase separation-Coacervation technique.				10	2
2.	Describe the various physicochemical and pharmaceutical factors to be considered in selection of a drug candidate for controlled delivery formulations				10	1
		Short Essay (Answer Any Two)				
3.	Explain concept, advantages and disadvantages of implants.				5	2
4.	Explain the approaches required for designing Activation -Modulated controlled drug delivery system.				5	1
5.	Define Polymers and Classify them. Give the applications of polymers in formulation of controlled release drug delivery systems.				5	1


PRINCIPAL
 College of Pharmaceutical sciences
 Dayananda Sagar University
 Kumaraswamy Layout,
 Bengaluru - 560 078.

	Marks	CO
Short Answers (Answer All)		
6. Write the applications of microencapsulation	2	2
7. Difference between sustained and controlled release system	2	1
8. Enlist the different approaches for designing of CDDS	2	1
9. How the half-life influences the design of controlled drug delivery systems.	2	1
10. What is the concept of controlled drug delivery system?	2	1

	Marks	CC
Short Answers (Answer All)		
6. Write the applications of microencapsulation	2	2
7. Difference between sustained and controlled release system	2	1
8. Enlist the different approaches for designing of CDDS	2	1
9. How the half-life influences the design of controlled drug delivery systems.	2	1
10. What is the concept of controlled drug delivery system?	2	1

	Marks	CC
Short Answers (Answer All)		
6. Write the applications of microencapsulation	2	2
7. Difference between sustained and controlled release system	2	1
8. Enlist the different approaches for designing of CDDS	2	1
9. How the half-life influences the design of controlled drug delivery systems.	2	1
10. What is the concept of controlled drug delivery system?	2	1


PRINCIPAL
 College of Pharmaceutical sciences
 Dayananda Sagar University,
 Kumaraswamy Layout,
 Bengaluru - 560 078.

6. Explain various elements of QbD.	5	3
Short Answers (Answer All)		
7. Define design space and control strategy.	2.5	3
8. Explain the significance of sensitivity analysis.	2.5	3

6. Explain various elements of QbD.	5	3
Short Answers (Answer All)		
7. Define design space and control strategy.	2.5	3
8. Explain the significance of sensitivity analysis.	2.5	3

6. Explain various elements of QbD.	5	3
Short Answers (Answer All)		
7. Define design space and control strategy.	2.5	3
8. Explain the significance of sensitivity analysis.	2.5	3

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: BACHELOR OF PHARMACY (B. PHARM) - 2017-18
SCHEME OF COURSE OF STUDY & ASSESSMENTS

SEMESTER I

SL.	COURSE CODE	COURSE TITLE	L	T	P	C	IA			SEE		TM	
							CMM	SE		M	D		
								M	D				
1	17BP101	HUMAN ANATOMY AND PHYSIOLOGY I- THEORY	3	1	-	4	10	15	1	75	3	100	
2	17BP102	PHARMACEUTICAL ANALYSIS- THEORY	3	1	-	4	10	15	1	75	3	100	
3	17BP103	PHARMACEUTICS I-THEORY	3	1	-	4	10	15	1	75	3	100	
4	17BP104	PHARMACEUTICAL INORGANIC CHEMISTRY- THEORY	3	1	-	4	10	15	1	75	3	100	
5	17BP105	COMMUNICATION SKILLS-THEORY*	2	-	-	2	5	10	1	35	1.5	50	
6	17BP106B	REMEDIAL BIOLOGY-THEORY*	2	-	-	2	5	10	1	35	1.5	50	
7	17BP106M	REMEDIAL MATHEMATICS-THEORY*	2	-	-	2	5	10	1	35	1.5	50	
8	17BP107	HUMAN ANATOMY AND PHYSIOLOGY I - PRACTICAL	-	-	4	2	5	10	4	35	4	50	
9	17BP108	PHARMACEUTICAL ANALYSIS - PRACTICAL	-	-	4	2	5	10	4	35	4	50	
10	17BP109	PHARMACEUTICS I- PRACTICAL	-	-	4	2	5	10	4	35	4	50	
11	17BP110	PHARMACEUTICAL INORGANIC CHEMISTRY-PRACTICAL	-	-	4	2	5	10	4	35	4	50	
12	17BP111	COMMUNICATION SKILLS-PRACTICAL*	-	-	2	1	5	5	2	15	2	25	
13	17BP112B	REMEDIAL BIOLOGY- PRACTICAL*	-	-	2	1	5	5	2	15	2	25	
TOTAL						32	27	70	115	23	490	31.5	675
						34	29	75	125	24	525	33	725
Applicable ONLY for the students studied Physics/Chemistry/Botany/ Zoology at HSC and appearing for Remedial Mathematics(RM) course.						36	30	80	130	26	540	35	750
Applicable ONLY for the students studied Mathematics/Physics/Chemistry at HSC and appearing for Remedial Biology(RB)course.													

L: Lecture, T:Tutorial, P:Practical, C:Credits, D: Duration in Hours
 IA: Internal Assessment, CMM: Continuous Mode Marks, SE: Sessional Exams, M: Marks, TM: Total Marks
 *Non University Examinations - The subject experts at college level shall conduct examinations

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: BACHELOR OF PHARMACY (B. PHARM) - 2017-18
SCHEME OF COURSE OF STUDY & ASSESSMENTS

SEMESTER II

SL.	COURSE CODE	COURSE TITLE	L	T	P	C	IA			SEE		TM
							CMM	SE		M	D	
								M	D			
1	17BP201	HUMAN ANATOMY AND PHYSIOLOGY II- THEORY	3	1	-	4	10	15	1	75	3	100
2	17BP202	PHARMACEUTICAL ORGANIC CHEMISTRY I- THEORY	3	1	-	4	10	15	1	75	3	100
3	17BP203	BIOCHEMISTRY- THEORY	3	1	-	4	10	15	1	75	3	100
4	17BP204	PATHOPHYSIOLOGY- THEORY	3	1	-	4	10	15	1	75	3	100
5	17BP205	COMPUTER APPLICATIONS IN PHARMACY- THEORY*	3	-	-	3	10	15	1	50	2	75
6	17BP206	ENVIRONMENTAL SCIENCES- THEORY*	3	-	-	3	10	15	1	50	2	75
7	17BP207	HUMAN ANATOMY AND PHYSIOLOGY II -PRACTICAL	-	-	4	2	5	10	4	35	4	50
8	17BP208	PHARMACEUTICAL ORGANIC CHEMISTRY I - PRACTICAL	-	-	4	2	5	10	4	35	4	50
9	17BP209	BIOCHEMISTRY- PRACTICAL	-	-	4	2	5	10	4	35	4	50
10	17BP210	COMPUTER APPLICATIONS IN PHARMACY- PRACTICAL*	-	-	2	1	5	5	2	15	2	25
TOTAL			18	4	14	29	80	125	20	520	30	725

L: Lecture, T:Tutorial, P:Practical, C:Credits, D: Duration in Hours

IA: Internal Assessment, CMM: Continuous Mode Marks, SE: Sessional Exams, M: Marks, TM: Total Marks

*Non University Examinations - The subject experts at college level shall conduct examinations

S. S. Srinivas
PRINCIPAL
 College of Pharmaceutical Sciences
 Dayananda Sagar University
 Kumaraswamy Layout,
 Bengaluru - 560 078.

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: BACHELOR OF PHARMACY (B. PHARM) - 2017-18
SCHEME OF COURSE OF STUDY & ASSESSMENTS
SEMESTER III

SL.	COURSE CODE	COURSE TITLE	L	T	P	C	IA			SEE		TM
							C	SE		M	D	
								M	M			
1	17BP301	PHARMACEUTICAL ORGANIC CHEMISTRY II- THEORY	3	1	-	4	10	15	1	75	3	100
2	17BP302	PHYSICAL PHARMACEUTICS I - THEORY	3	1	-	4	10	15	1	75	3	100
3	17BP303	PHARMACEUTICAL MICROBIOLOGY- THEORY	3	1	-	4	10	15	1	75	3	100
4	17BP304	PHARMACEUTICAL ENGINEERING - THEORY	3	1	-	4	10	15	1	75	3	100
5	17BP305	PHARMACEUTICAL ORGANIC CHEMISTRY II - PRACTICAL	-	-	4	2	5	10	4	35	4	50
6	17BP306	PHYSICAL PHARMACEUTICS I- PRACTICAL	-	-	4	2	5	10	4	35	4	50
7	17BP307	PHARMACEUTICAL MICROBIOLOGY- PRACTICAL	-	-	4	2	5	10	4	35	4	50
8	17BP308	PHARMACEUTICAL ENGINEERING -PRACTICAL	-	-	4	2	5	10	4	35	4	50
TOTAL			12	4	16	24	60	100	20	440	28	600

L: Lecture , T:Tutorial , P:Practical , C:Credits , D : Duration in Hours

IA: Internal Assessment , CMM : Continuous Mode Marks , SE : Sessional Exams , M: Marks , TM : Total Marks

*Non University Examinations - The subject experts at college level shall conduct examinations

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: BACHELOR OF PHARMACY (B. PHARM) - 2017-18
SCHEME OF COURSE OF STUDY & ASSESSMENTS
SEMESTER IV

SL.	COURSE CODE	COURSE TITLE	L	T	P	C	IA			SEE		TM
							C	SE		M	D	
								M	M			
1	17BP401	PHARMACEUTICAL ORGANIC CHEMISTRY III-THEORY	3	1	-	4	10	15	1	75	3	100
2	17BP402	MEDICINAL CHEMISTRY I-THEORY	3	1	-	4	10	15	1	75	3	100
3	17BP403	PHYSICAL PHARMACEUTICS II- THEORY	3	1	-	4	10	15	1	75	3	100
4	17BP404	PHARMACOLOGYI- THEORY	3	1	-	4	10	15	1	75	3	100
5	17BP405	PHARMACOGNOSY AND PHYTOCHEMISTRY I- THEORY	-	-	4	2	5	10	4	35	4	50
6	17BP406	MEDICINAL CHEMISTRY I-PRACTICAL	-	-	4	2	5	10	4	35	4	50
7	17BP407	PHYSICAL PHARMACEUTICS II- PRACTICAL	-	-	4	2	5	10	4	35	4	50
8	17BP408	PHARMACOLOGY I- PRACTICAL	-	-	4	2	5	10	4	35	4	50
9	17BP409	PHARMACOGNOSY AND PHYTOCHEMISTRY I- PRACTICAL	-	-	4	2	5	10	4	35	4	50
TOTAL			15	5	16	28	70	115	21	515	31	700

L: Lecture , T:Tutorial , P:Practical , C:Credits , D : Duration in Hours

IA: Internal Assessment , CMM : Continuous Mode Marks , SE : Sessional Exams , M: Marks , TM : Total Marks

*Non University Examinations - The subject experts at college level shall conduct examinations

(Signature)
PRINCIPAL
 College of Pharmaceutical sciences
 Dayananda Sagar University
 Kumaraswamy Layout,
 Bengaluru - 560 078.

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: BACHELOR OF PHARMACY (B. PHARM) - 2017-18
SCHEME OF COURSE OF STUDY & ASSESMENTS

SEMESTER I

SL.	COURSE CODE	COURSE TITLE	L	T	P	C	IA			SEE		TM
							CMM	SE		M	D	
								M	D			
1	17BP101	HUMAN ANATOMY AND PHYSIOLOGY I- THEORY	3	1	-	4	10	15	1	75	3	100
2	17BP102	PHARMACEUTICAL ANALYSIS- THEORY	3	1	-	4	10	15	1	75	3	100
3	17BP103	PHARMACEUTICS I- THEORY	3	1	-	4	10	15	1	75	3	100
4	17BP104	PHARMACEUTICAL INORGANIC CHEMISTRY- THEORY	3	1	-	4	10	15	1	75	3	100
5	17BP105	COMMUNICATION SKILLS-THEORY*	2	-	-	2	5	10	1	35	1.5	50
6	17BP106B	REMEDIAL BIOLOGY-THEORY*	2	-	-	2	5	10	1	35	1.5	50
7	17BP106M	REMEDIAL MATHEMATICS-THEORY*	2	-	-	2	5	10	1	35	1.5	50
8	17BP107	HUMAN ANATOMY AND PHYSIOLOGY I - PRACTICAL	-	-	4	2	5	10	4	35	4	50
9	17BP108	PHARMACEUTICAL ANALYSIS - PRACTICAL	-	-	4	2	5	10	4	35	4	50
10	17BP109	PHARMACEUTICS I- PRACTICAL	-	-	4	2	5	10	4	35	4	50
11	17BP110	PHARMACEUTICAL INORGANIC CHEMISTRY-PRACTICAL	-	-	4	2	5	10	4	35	4	50
12	17BP111	COMMUNICATION SKILLS-PRACTICAL*	-	-	2	1	5	5	2	15	2	25
13	17BP112B	REMEDIAL BIOLOGY-PRACTICAL*	-	-	2	1	5	5	2	15	2	25
TOTAL			32			27	70	115	23	490	31.5	675
			HRS									
Applicable ONLY for the students studied Physics/Chemistry/Botany/ Zoology at HSC and appearing for Remedial Mathematics(RM) course.			34			29	75	125	24	525	33	725
Applicable ONLY for the students studied Mathematics/Physics/Chemistry at HSC and appearing for Remedial Biology(RB)course.			HRS									
			36			30	80	130	26	540	35	750
			HRS									

L: Lecture, T:Tutorial, P:Practical, C:Credits, D : Duration in Hours
 IA: Internal Assessment , CMM : Continuous Mode Marks, SE : Sessional Exams, M: Marks, TM : Total Marks
 *Non University Examinations - The subject experts at college level shall conduct examinations

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: BACHELOR OF PHARMACY (B. PHARM) - 2017-18
SCHEME OF COURSE OF STUDY & ASSESMENTS

SEMESTER II

SL.	COURSE CODE	COURSE TITLE	L	T	P	C	IA			SEE		TM
							CMM	SE		M	D	
								M	D			
1	17BP201	HUMAN ANATOMY AND PHYSIOLOGY II- THEORY	3	1	-	4	10	15	1	75	3	100
2	17BP202	PHARMACEUTICAL ORGANIC CHEMISTRY I- THEORY	3	1	-	4	10	15	1	75	3	100
3	17BP203	BIOCHEMISTRY- THEORY	3	1	-	4	10	15	1	75	3	100
4	17BP204	PATHOPHYSIOLOGY- THEORY	3	-	-	3	10	15	1	50	2	75
5	17BP205	COMPUTER APPLICATIONS IN PHARMACY- THEORY*	3	-	-	3	10	15	1	50	2	75
6	17BP206	ENVIRONMENTAL SCIENCES- THEORY*	-	-	4	2	5	10	4	35	4	50
7	17BP207	HUMAN ANATOMY AND PHYSIOLOGY II -PRACTICAL	-	-	4	2	5	10	4	35	4	50
8	17BP208	PHARMACEUTICAL ORGANIC CHEMISTRY I - PRACTICAL	-	-	4	2	5	10	4	35	4	50
9	17BP209	BIOCHEMISTRY- PRACTICAL	-	-	2	1	5	5	2	15	2	25
10	17BP210	COMPUTER APPLICATIONS IN PHARMACY- PRACTICAL*	18	4	14	29	80	125	20	520	30	725
TOTAL												

L: Lecture, T:Tutorial, P:Practical, C:Credits, D : Duration in Hours
 IA: Internal Assessment , CMM : Continuous Mode Marks, SE : Sessional Exams, M: Marks, TM : Total Marks
 *Non University Examinations - The subject experts at college level shall conduct examinations

[Signature]
PRINCIPAL
 College of Pharmaceutical sciences
 Layananda Sagar University
 Kumaraswamy Layout,
 Bengaluru - 560 078.

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: BACHELOR OF PHARMACY (B. PHARM) - 2017-18
SCHEME OF COURSE OF STUDY & ASSESSMENTS
SEMESTER III

SL.	COURSE CODE	COURSE TITLE	L	T	P	C	IA			SEE		TM
							C	SE		M	D	
								M	M			
1	17BP301	PHARMACEUTICAL ORGANIC CHEMISTRY II- THEORY	3	1	-	4	10	15	1	75	3	100
2	17BP302	PHYSICAL PHARMACEUTICS I- THEORY	3	1	-	4	10	15	1	75	3	100
3	17BP303	PHARMACEUTICAL MICROBIOLOGY- THEORY	3	1	-	4	10	15	1	75	3	100
4	17BP304	PHARMACEUTICAL ENGINEERING - THEORY	-	-	4	2	5	10	4	35	4	50
5	17BP305	PHARMACEUTICAL ORGANIC CHEMISTRY II - PRACTICAL	-	-	4	2	5	10	4	35	4	50
6	17BP306	PHYSICAL PHARMACEUTICS I- PRACTICAL	-	-	4	2	5	10	4	35	4	50
7	17BP307	PHARMACEUTICAL MICROBIOLOGY- PRACTICAL	-	-	4	2	5	10	4	35	4	50
8	17BP308	PHARMACEUTICAL ENGINEERING -PRACTICAL	-	-	4	2	5	10	4	35	4	50
TOTAL			12	4	16	24	60	100	20	440	28	600

L: Lecture, T:Tutorial, P:Practical, C:Credits, D: Duration in Hours

IA: Internal Assessment, CMM : Continuous Mode Marks, SE : Sessional Exams, M: Marks, TM : Total Marks

*Non University Examinations - The subject experts at college level shall conduct examinations

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: BACHELOR OF PHARMACY (B. PHARM) - 2017-18
SCHEME OF COURSE OF STUDY & ASSESSMENTS
SEMESTER IV

SL.	COURSE CODE	COURSE TITLE	L	T	P	C	IA			SEE		TM
							C	SE		M	D	
								M	M			
1	17BP401	PHARMACEUTICAL ORGANIC CHEMISTRY III-THEORY	3	1	-	4	10	15	1	75	3	100
2	17BP402	MEDICINAL CHEMISTRY I-THEORY	3	1	-	4	10	15	1	75	3	100
3	17BP403	PHYSICAL PHARMACEUTICS II- THEORY	3	1	-	4	10	15	1	75	3	100
4	17BP404	PHARMACOLOGYI- THEORY	3	1	-	4	10	15	1	75	3	100
5	17BP405	PHARMACOGNOSY AND PHYTOCHEMISTRY I- THEORY	3	1	-	4	10	15	1	75	3	100
6	17BP406	MEDICINAL CHEMISTRY I-PRACTICAL	-	-	4	2	5	10	4	35	4	50
7	17BP407	PHYSICAL PHARMACEUTICS II- PRACTICAL	-	-	4	2	5	10	4	35	4	50
8	17BP408	PHARMACOLOGY I- PRACTICAL	-	-	4	2	5	10	4	35	4	50
9	17BP409	PHARMACOGNOSY AND PHYTOCHEMISTRY I- PRACTICAL	-	-	4	2	5	10	4	35	4	50
TOTAL			15	5	16	28	70	115	21	515	31	700

L: Lecture, T:Tutorial, P:Practical, C:Credits, D: Duration in Hours

IA: Internal Assessment, CMM : Continuous Mode Marks, SE : Sessional Exams, M: Marks, TM : Total Marks

*Non University Examinations - The subject experts at college level shall conduct examinations

S. Ghosh
PRINCIPAL
 College of Pharmaceutical sciences
 Dayananda Sagar University
 Kumaraswamy Layout,
 Bengaluru - 560 078.

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: BACHELOR OF PHARMACY (B. PHARM) - 2017-18
SCHEME OF COURSE OF STUDY & ASSESMENTS

SEMESTER V

SL.	COURSE CODE	COURSE TITLE	L	T	P	C	IA			SEE		TM
							C	SE		M	D	
								M	M			
1	17BP501	MEDICINAL CHEMISTRY II - THEORY	3	1	-	4	10	15	1	5	3	100
2	17BP502	FORMULATIVE PHARMACY-THEORY	3	1	-	4	10	15	1	75	3	100
3	17BP503	PHARMACOLOGY II- THEORY	3	1	-	4	10	15	1	75	3	100
4	17BP504	PHARMACOGNOSY AND PHYTOCHEMISTRY II- THEORY	3	1	-	4	10	15	1	75	3	100
5	17BP505	PHARMACEUTICAL JURISPRUDENCE - THEORY	-	-	4	2	5	10	4	35	4	50
6	17BP506	FORMULATIVE PHARMACY-PRACTICAL	-	-	4	2	5	10	4	35	4	50
7	17BP507	PHARMACOLOGY II- PRACTICAL	-	-	4	2	5	10	4	35	4	50
8	17BP508	PHARMACOGNOSY AND PHYTOCHEMISTRY II-PRACTICAL	-	-	4	2	5	10	7	480	27	650
TOTAL			15	5	12	26	65	105	17	480	27	650

L: Lecture, T:Tutorial, P:Practical, C:Credits, D: Duration in Hours

IA: Internal Assessment, CMM: Continuous Mode Marks, SE: Sessional Exams, M: Marks, TM: Total Marks

*Non University Examinations - The subject experts at college level shall conduct examinations

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: BACHELOR OF PHARMACY (B. PHARM) - 2017-18
SCHEME OF COURSE OF STUDY & ASSESMENTS

SEMESTER VI

S L.	COURSE CODE	COURSE TITLE	L	T	P	C	IA			SEE		TM
							C	SE		M	D	
								M	M			
1	17BP601	MEDICINAL CHEMISTRY III - THEORY	3	1	-	4	10	15	1	75	3	100
2	17BP602	PHARMACOLOGY III- THEORY	3	1	-	4	10	15	1	75	3	100
3	17BP603	HERBAL DRUGTECHNOLOGY- THEORY	3	1	-	4	10	15	1	75	3	100
4	17BP604	BIOPHARMACEUTICS AND PHARMACOKINETICS -THEORY	3	1	-	4	10	15	1	75	3	100
5	17BP605	PHARMACEUTICAL BIOTECHNOLOGY- THEORY	3	1	-	4	10	15	1	75	3	100
6	17BP606	QUALITY ASSURANCE -THEORY	-	-	4	2	5	10	4	35	4	50
7	17BP607	MEDICINAL CHEMISTRY III- PRACTICAL	-	-	4	2	5	10	4	35	4	50
8	17BP608	PHARMACOLOGY III - PRACTICAL	-	-	4	2	5	10	4	35	4	50
9	17BP609	HERBAL DRUGTECHNOLOGY- PRACTICAL	18	6	12	30	75	120	18	555	30	750
TOTAL												

L: Lecture, T:Tutorial, P:Practical, C:Credits, D: Duration in Hours

IA: Internal Assessment, CMM: Continuous Mode Marks, SE: Sessional Exams, M: Marks, TM: Total Marks

*Non University Examinations - The subject experts at college level shall conduct examinations

S. S. Srinivas
PRINCIPAL
 College of Pharmaceutical sciences
 Dayananda Sagar University
 Kumaraswamy Layout,
 Bengaluru - 560 078.

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME : BACHELOR OF PHARMACY (B. PHARM) - 2017-18
SCHEME OF COURSE OF STUDY & ASSESSMENTS SEMESTER VII

S L	COURSE CODE	COURSE TITLE	L	T	P	C	IA			SEE		TM
							C M M	SE		M	D	
								M	D			
1	17BP701	INSTRUMENTAL METHODS OF ANALYSIS - THEORY	3	1	-	4	10	15	1	75	3	100
2	17BP702	INDUSTRIAL PHARMACY- THEORY	3	1	-	4	10	15	1	75	3	100
3	17BP703	PHARMACY PRACTICE - THEORY	3	1	-	4	10	15	1	75	3	100
4	17BP704	NOVEL DRUG DELIVERY SYSTEM- THEORY	3	1	-	4	10	15	1	75	3	100
5	17BP705	INSTRUMENTAL METHODS OF ANALYSIS - PRACTICAL	-	-	4	2	5	10	4	35	4	50
6	17BP706	PRACTICE SCHOOL*	-	-	12	6	25	-	-	125	5	150
TOTAL			12	4	16	24	70	70	8	460	21	600

L: Lecture , T:Tutorial , P:Practical , C:Credits, D : Duration in Hours

IA: Internal Assessment , CMM : Continuous Mode Marks , SE : Sessional Exams , M: Marks , TM : Total Marks

*Non University Examinations -

1. The subject experts at college level shall conduct examinations
2. Student has to undergo 150 hrs practical training in the following domains declared by the programme committee form time to time.

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: BACHELOR OF PHARMACY (B. PHARM) - 2017-18
SCHEME OF COURSE OF STUDY & ASSESSMENTS SEMESTER VIII

SL.	COURSE CODE	COURSE TITLE	L	T	P	C	IA			SEE		TM
							C M M	SE		M	D	
								M	D			
1	17BP801	BIOSTATISTICS AND RESEARCH METHODOLOGY	3	1	-	4	10	15	1	75	3	100
2	17BP802	SOCIAL AND PREVENTIVE PHARMACY	3	1	-	4	10	15	1	75	3	100
3	17BP803	PHARMACEUTICAL MARKETING										
4	17BP804	PHARMACEUTICAL REGULATORY SCIENCE	3	1		4	10	15	1	75	3	100
5	17BP805	PHARMACOVIGILANCE	+	+		+	+	+	+	+	+	+
6	17BP806	QUALITY CONTROL AND STANDARDIZATIONS OF HERBALS	3	1	-	4	10	15	1	75	3	100
7	17BP807	COMPUTER AIDED DRUG DESIGN	=	=		=	=	=	=	=	=	=
8	17BP808	CELL AND MOLECULAR BIOLOGY	6	2		8	20	30	4	150	6	200
9	17BP809	COSMETIC SCIENCE										
10	17BP810	EXPERIMENTAL PHARMACOLOGY										
11	17BP811	ADVANCED INSTRUMENTATION TECHNIQUES										
12	17BP812	DIETARY SUPPLEMENTS AND NEUTRACEUTICALS										
13	17BP813	PROJECT WORK **	12	-	-	6	-	-	-	150	4	150
TOTAL			24	4	00	22	40	60	6	450	16	550

L: Lecture , T:Tutorial , P:Practical , C:Credits, D : Duration in Hours

IA: Internal Assessment , CMM : Continuous Mode Marks , SE : Sessional Exams , M: Marks , TM : Total Marks

*Non University Examinations - The subject experts at college level shall conduct examinations

** The project work of the student should be related to choice of one of the elective subjects

One credit point assigned for extracurricular and co-curricular activities shall be given by the Dean of the college and the same shall be submitted to the University.

S. Hanumanth N.M.

PRINCIPAL

College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: DOCTOR OF PHARMACY (PHARM D)- 2015-16

YEAR - 2

SL NO	COURSE CODE	COURSE TITLE	CR / AU	NO. OF HOURS OF TEACHING			SCHEME OF EVALUATION	
				L	P	C	IA MARKS	ANNUAL MARKS
1	15PD201	PHARMACOLOGY - I	CR	3	--	3	30	70
2	15PD202	PHARMACEUTICAL MICROBIOLOGY	CR	3	--	3	30	70
3	15PD203	PHARMACOGNOSY AND PHYTOPHARMACEUTICALS	CR	3	--	3	30	70
4	15PD204	COMMUNITY PHARMACY	CR	2	--	2	30	70
5	15PD205	PATHOPHYSIOLOGY	CR	3	--	3	30	70
6	15PD206	PHARMACOTHERAPEUTICS - I	CR	3	--	3	30	70
7	15PD271	PHARMACOGNOSY AND PHYTOPHARMACEUTICALS	CR	--	3	1.5	30	70
8	15PD272	PHARMACEUTICAL MICROBIOLOGY	CR	--	3	1.5	30	70
9	15PD273	PHARMACOTHERAPEUTICS - I	CR	--	3	1.5	30	70
GRAND TOTAL = 900				17	9	21.5	270	630
10	15PD291	ENVIRONMENTAL SCIENCE	AU	2	--	--	25	50
11	15PD292	KANNAIDA	AU	2	--	--	25	50
12	15PD293	STATISTICS AND COMPUTER SCIENCE	AU	1	--	--	25	50

Note: CR - Credit Subject, AU - Audit Subject, L - Lecture, P - Practical's, C - No. of Credits, IA - Internal Assessment

Signature N.M.
PRINCIPAL
 College of Pharmaceutical Sciences
 Dayananda Sagar University,
 Kumaraswamy Layout,
 Bengaluru - 560 078.

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: DOCTOR OF PHARMACY (PHARM D)- 2015-16

YEAR - 1

SL NO	COURSE CODE	COURSE TITLE	CR / AU	NO. OF HOURS OF TEACHING			SCHEME OF EVALUATION	
				L	P	C	IA MARKS	ANNUAL MARKS
1	15PD101	HUMAN ANATOMY AND PHYSIOLOGY	CR	3	--	3	30	70
2	15PD102	PHARMACEUTICS	CR	2	--	2	30	70
3	15PD103	MEDICINAL BIOCHEMISTRY	CR	3	--	3	30	70
4	15PD104	PHARMACEUTICAL ORGANIC CHEMISTRY	CR	3	--	3	30	70
5	15PD105	PHARMACEUTICAL INORGANIC CHEMISTRY	CR	3	--	3	30	70
6	15PD171	HUMAN ANATOMY AND PHYSIOLOGY	CR	--	1.5	1.5	30	70
7	15PD172	PHARMACEUTICS	CR	--	1.5	1.5	30	70
8	15PD173	MEDICINAL BIOCHEMISTRY	CR	--	1.5	1.5	30	70
9	15PD174	PHARMACEUTICAL ORGANIC CHEMISTRY	CR	--	1.5	1.5	30	70
10	15PD175	PHARMACEUTICAL INORGANIC CHEMISTRY	CR	--	1.5	1.5	30	70
GRAND TOTAL = 1000				14	7.5	21.5	300	700
11	15PD191	REMEDIAL MATHEMATICS	AU				25	50
12	15PD192	REMEDIAL BIOLOGY	AU	2	--	2	25	50
13	15PD193	ENGLISH	AU	1	--	1	25	50
14	15PD194	CONSTITUTION OF INDIA	AU	1	--	1	25	50

Note: (i) Remedial Mathematics for PCB students only
 (ii) Remedial Biology for PCM students only
 (iii) CR - Credit Subject, AU - Audit Subject, L - Lecture, P - Practical's, C - No. of Credits, IA - Internal Assessment

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: DOCTOR OF PHARMACY (PHARM D) - 2015-16

YEAR - 3

SL	COURSE CODE	COURSE TITLE	CR/AU	NO. OF HOURS OF TEACHING			SCHEME OF EVALUATION		ANNUAL MARKS
				L	P	C	IA MARKS		
1	1SPD301	PHARMACOLOGY II	CR	3	--	3	30	70	
2	1SPD302	PHARMACEUTICAL ANALYSIS	CR	3	--	3	30	70	
3	1SPD303	PHARMACOTHERAPEUTICS II	CR	3	--	3	30	70	
4	1SPD304	PHARMACEUTICAL JURISPRUDENCE	CR	2	--	2	30	70	
5	1SPD305	MEDICAL CHEMISTRY	CR	3	--	3	30	70	
6	1SPD306	PHARMACEUTICAL FORMULATIONS	CR	2	--	2	30	70	
7	1SPD307	PHARMACOLOGY II	CR	--	1.5	1.5	30	70	
8	1SPD371	PHARMACEUTICAL ANALYSIS	CR	--	1.5	1.5	30	70	
9	1SPD372	PHARMACOTHERAPEUTICS II	CR	--	1.5	1.5	30	70	
10	1SPD373	PHARMACOTHERAPEUTICS II	CR	--	1.5	1.5	30	70	
11	1SPD374	MEDICAL CHEMISTRY	CR	--	1.5	1.5	30	70	
12	1SPD375	PHARMACEUTICAL FORMULATIONS	CR	--	1.5	1.5	30	70	
GRAND TOTAL : 1100									
16				16	7.5	23.5	330	770	
17	1SPD391	INTELLECTUAL PROPERTY RIGHTS	AU	2	--	--	25	50	

Note: CR - Credit Subject, AU - Audit Subject, L - Lecture, P - Practical's, C - No. of Credits, IA - Internal Assessment

SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: DOCTOR OF PHARMACY (PHARM D) - 2015-16

YEAR - 4

SL	COURSE CODE	COURSE TITLE	CR/AU	NO. OF HOURS OF TEACHING			SCHEME OF EVALUATION		ANNUAL MARKS
				L	P	C	IA MARKS		
1	1SPD401	PHARMACOTHERAPEUTICS III	CR	3	--	3	30	70	
2	1SPD402	HOSPITAL PHARMACY	CR	2	--	2	30	70	
3	1SPD403	CLINICAL PHARMACY	CR	3	--	3	30	70	
4	1SPD404	BIostatistics & RESEARCH METHODOLOGY	CR	2	--	2	30	70	
5	1SPD405	BIOPHARMACEUTICS & PHARMACOKINETICS	CR	3	--	3	30	70	
6	1SPD406	CLINICAL TOXICOLOGY	CR	2	--	2	30	70	
7	1SPD471	PHARMACOTHERAPEUTICS III	CR	--	3	1.5	30	70	
8	1SPD472	HOSPITAL PHARMACY	CR	--	3	1.5	30	70	
9	1SPD473	CLINICAL PHARMACY	CR	--	3	1.5	30	70	
10	1SPD474	BIOPHARMACEUTICS & PHARMACOKINETICS	CR	--	3	1.5	30	70	
Grand Total 1000									
15				15	12	21	300	700	

Note: CR - Credit Subject, AU - Audit Subject, L - Lecture, P - Practical's, C - No. of Credits, IA - Internal Assessment

Dayananda N.M.

PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.

**SCHOOL OF HEALTH SCIENCES
COLLEGE OF PHARMACEUTICAL SCIENCES
PROGRAMME: DOCTOR OF PHARMACY (PHARM D) - 2015-16**

YEAR - 5

SL	COURSE CODE	COURSE TITLE	CR/ AU	NO. OF HOURS OF TEACHING			SCHEME OF EVALUATION	
				L	P	C	IA MARKS	ANNUAL MARKS
1	1SPD501	CLINICAL RESEARCH	CR	3	--	3	30	70
2	15PD502	PHARMACOEPIDEMIOLOGY & PHARMACOECONOMICS	CR	3	--	3	30	70
3	15PD503	CLINICAL PHARMACOKINETICS & PHARMACOTHERAPEUTICS DRUG MONITORING	CR	2	--	2	30	70
4	15PD504	CLERKSHIP	CR	1	--	1	30	70
5	15PD505	PROJECT WORK	CR	--	20	20	--	100
Grand Total 1000				09	20	29	120	380

Note: CR - Credit Subject, AU - Audit Subject, L - Lecture, P - Practical's, C - No. of Credits,
IA - Internal Assessment

YEAR - 6

SL	COURSE CODE	COURSE TITLE	CR/ AU	NO. OF HOURS OF TEACHING			SCHEME OF EVALUATION	
				L	P	C	IA MARKS	ANNUAL MARKS
1	15PD681	DISSERTATION	CR	--	--	--	--	--

[Signature] N.M.

PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University,
Kumaraswamy Layout,
Bengaluru - 560 078.

BRANCH / SPECIALIZATION: PHARMACOLOGY
SEMESTER - 1

SL	COURSE CODE	COURSE TITLE	CH	CP	HW	INTERNAL ASSESSMENT				END SEM EXAM		TOTAL
						CM	SE		T	M	D	
							M	D				
1	17MPL101	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	4	4	4	10	15	1H	25	75	3H	100
2	17MPL102	ADVANCED PHARMACOLOGY-I	4	4	4	10	15	1H	25	75	3H	100
3	17MPL103	PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS-I	4	4	4	10	15	1H	25	75	3H	100
4	17MPL104	CELLULAR AND MOLECULAR PHARMACOLOGY	4	4	4	10	15	1H	25	75	3H	100
5	17MPL105	EXPERIMENTAL PHARMACOLOGY - I	12	6	12	20	30	6H	50	100	6H	150
6	17MPL106	SEMINAR/ASSIGNMENT	7	4	7	-	-	-	-	-	-	100
GRAND TOTAL			35	26	35							650

SEMESTER - 2

SL	COURSE CODE	COURSE TITLE	CH	CP	HW	INTERNAL ASSESSMENT				END SEM EXAM		TOTAL
						CM	SE		T	M	D	
							M	D				
1	17MPL201	ADVANCED PHARMACOLOGY II	4	4	4	10	15	1H	25	75	3H	100
2	17MPL202	PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS- II	4	4	4	10	15	1H	25	75	3H	100
3	17MPL203	PRINCIPLES OF DRUG DISCOVERY	4	4	4	10	15	1H	25	75	3H	100
4	17MPL204	CLINICAL RESEARCH AND PHARMA COVIGILANCE	4	4	4	10	15	1H	25	75	3H	100
5	17MPL205	EXPERIMENTAL PHARMACOLOGY - II	12	6	12	20	30	6H	50	100	6H	150
6	17MPL206	SEMINAR/ASSIGNMENT	7	4	7	-	-	-	-	-	-	100
GRAND TOTAL			35	26	35							650

CH - CREDIT HOURS, CP - CREDIT POINTS, HW - HOURS PER WEEK, CM - CONTINUOUS MODE, SE-
SESSIONAL EXAMS, M - MARKS, D - DURATION, T- TOTAL, H - HOURS

SEMESTER/YEAR : II SEM

:
:
:
COMMON TO ALL SPECIALIZATIONS

SEMESTER - 3

SL	COURSE CODE	COURSE TITLE	CH	CP	HW	INTERNAL ASSESSMENT				END SEM EXAM		TOTAL
						CM	SE		T	M	D	
							M	D				
1	17MPR301	RESEARCH METHODOLOGY AND BIOSTATISTICS*	4	4	4	10	15	1H	25	75	3H	100
2	17MPR302	JOURNAL CLUB	1	1	1	-	-	-	25	-	-	25
3	17MPR303	DISCUSSION / PRESENTATION (PROPOSAL PRESENTATION)	2	2	2	-	-	-	50	-	-	50
4	17MPR304	RESEARCH WORK*	28	14	18	-	-	-	-	350	1H	350
GRAND TOTAL			35	21	35	-	-	-	-	-	-	525

SEMESTER - 4

SL	COURSE CODE	COURSE TITLE	CH	CP	HW	INTERNAL ASSESSMENT				END SEM EXAM		TOTAL
						CM	SE		T	M	D	
							M	D				
1	17MPR401	JOURNAL CLUB	1	1	1	-	-	-	25	-	-	25
2	17MPR402	DISCUSSION / PRESENTATION (PROPOSAL PRESENTATION)	3	3	3	-	-	-	75	-	-	75
3	17MPR403	RESEARCH WORK AND COLLOQUIUM	31	16	31	-	-	-	-	400	1H	400
GRAND TOTAL			35	20	35	-	-	-	-	-	-	500

CH - CREDIT HOURS, CP - CREDIT POINTS, HW - HOURS PER WEEK, CM - CONTINUOUS MODE, SE-
SESSIONAL EXAMS, M - MARKS, D - DURATION, T- TOTAL, H - HOURS
*NON UNIVERSITY EXAMINATION

S. K. M. T.
PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout
Bengaluru - 560 078.

SEMESTER/YEAR : II SEM

BRANCH / SPECIALIZATION: PHARMACEUTICS
SEMESTER - 1

SL	COURSE CODE	COURSE TITLE	CH	CP	HW	INTERNAL ASSESSMENT				END SEM EXAM		TOTAL
						CM	SE	M	D	T	M	
1	17MPH101	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	4	4	4	10	15	1H	25	75	3H	100
2	17MPH102	DRUG DELIVERY SYSTEM	4	4	4	10	15	1H	25	75	3H	100
3	17MPH103	MODERN PHARMACEUTICS	4	4	4	10	15	1H	25	75	3H	100
4	17MPH104	REGULATORY AFFAIR PHARMACEUTICS	4	4	4	10	15	1H	25	75	3H	100
5	17MPH105	PHARMACEUTICS PRACTICAL I	12	6	12	20	30	6H	50	10	6H	150
6	17MPH106	SEMINAR /ASSIGNMENT	7	4	7	-	-	-	-	-	-	100
GRAND TOTAL			35	26	35							650

SEMESTER - 2

SL	COURSE CODE	COURSE TITLE	CH	CP	HW	INTERNAL ASSESSMENT				END SEM EXAM		TOTAL
						CM	SE	M	D	T	M	
1	17MPH201	MOLECULAR PHARMACEUTICS (NANOTECH AND TARGETED DDS)	4	4	4	10	15	1H	25	75	3H	100
2	17MPH202	ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS	4	4	4	10	15	1H	25	75	3H	100
3	17MPH203	COMPUTER AIDED DRUG DELIVERY SYSTEM	4	4	4	10	15	1H	25	75	3H	100
4	17MPH204	COSMETIC AND COSMECEUTICALS	4	4	4	10	15	1H	25	75	3H	100
5	17MPH205	PHARMACEUTICS PRACTICAL II	12	6	12	20	30	6H	50	100	6H	150
6	17MPH206	SEMINAR /ASSIGNMENT	7	4	7	-	-	-	-	-	-	100
GRAND TOTAL			35	26	35							650

CH - CREDIT HOURS, CP - CREDIT POINTS, HW - HOURS PER WEEK, CM - CONTINUOUS MODE, SE - SESSIONAL EXAMS, M - MARKS, D - DURATION, T - TOTAL, H - HOURS

BRANCH / SPECIALIZATION: PHARMACEUTICAL CHEMISTRY SEMESTER - 1

SEMESTER/YEAR : II SEM

BRANCH / SPECIALIZATION: PHARMACEUTICS
SEMESTER - 2

SL	COURSE CODE	COURSE TITLE	CH	CP	HW	INTERNAL ASSESSMENT				END SEM EXAM		TOTAL
						CM	SE	M	D	T	M	
1	17MPC101	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	4	4	4	10	15	1H	25	75	3H	100
2	17MPC102	ADVANCED ORGANIC CHEMISTRY - I	4	4	4	10	15	1H	25	75	3H	100
3	17MPC103	ADVANCED MEDICINAL CHEMISTRY	4	4	4	10	15	1H	25	75	3H	100
4	17MPC104	CHEMISTRY OF NATURAL PRODUCTS	4	4	4	10	15	1H	25	75	3H	100
5	17MPC105	PHARMACEUTICAL CHEMISTRY PRACTICAL I	12	6	12	20	30	6H	50	100	6H	150
6	17MPC106	SEMINAR/ASSIGNMENT	7	4	7	-	-	-	-	-	-	100
GRAND TOTAL			35	26	35							650

SEMESTER - 2

SL	COURSE CODE	COURSE TITLE	CH	CP	HW	INTERNAL ASSESSMENT				END SEM EXAM		TOTAL
						CM	SE	M	D	T	M	
1	17MPC201	ADVANCED SPECTRAL ANALYSIS	4	4	4	10	15	1H	25	75	3H	100
2	17MPC202	ADVANCED ORGANIC CHEMISTRY - II	4	4	4	10	15	1H	25	75	3H	100
3	17MPC203	COMPUTER AIDED DRUG DESIGN	4	4	4	10	15	1H	25	75	3H	100
4	17MPC204	PHARMACEUTICAL PROCESS CHEMISTRY	4	4	4	10	15	1H	25	75	3H	100
5	17MPC205	PHARMACEUTICAL CHEMISTRY PRACTICAL II	12	6	12	20	30	6H	50	100	6H	150
6	17MPC206	SEMINAR/ASSIGNMENT	7	4	7	-	-	-	-	-	-	100
GRAND TOTAL			35	26	35							650

CH - CREDIT HOURS, CP - CREDIT POINTS, HW - HOURS PER WEEK, CM - CONTINUOUS MODE, SE - SESSIONAL EXAMS, M - MARKS, D - DURATION, T - TOTAL, H - HOURS

PRINCIPAL

College of Pharmaceutical sciences
Ananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University

College of Pharmaceutical Sciences

Course Outcomes – B.Pharm

Ist Sem B. Pharm

Sl No	Subject Code	Subject Name	Course Outcomes
1	17BP101 17BP107	Human Anatomy and Physiology - I	Upon completion of this course the student should be able to – <ol style="list-style-type: none">1. Describe the general morphology, structure, and purposes of the various human bodily organs.2. The numerous homeostatic processes and their imbalances should be justified.3. Describe the numerous organs and tissues that make up the body multiple systems.4. experiments involving the neurological system, the body, and particular senses.5. Examine the coordinated operation of the many organs within each system.
2	17BP102 17BP108	Pharmaceutical Analysis	Upon completion of the course student shall be able to – Integrating analytical skills <ol style="list-style-type: none">1. Predicting fundamental methodology to prepare different strength of solutions2. Estimating the various volumetric and electrochemical titrations3. outlining the sources of mistakes and errors.4. Inferring the basic knowledge in the principles of electrochemical analytical techniques
3	17BP103 17BP109 I	Pharmaceutics-I	Upon completion of this course the student should be able to: <ol style="list-style-type: none">1. Illustrate the different parts of a prescription with their significance and various operational aspects in compounding and dispensing of a prescription.

[Signature]
PRINCIPAL

College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bangalore - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			<p>2. Critique on different pharmaceutical calculation involved in formulation and explore the rules to prepare and dispense of various types of powders</p> <p>3. Elucidate the various excipients used in liquid orals and enumerate the identification, precautions on instabilities of biphasic liquids</p> <p>4. Estimate the percentage of solutions by allegation method, Convert the solutions to proof spirit, find out the isotonicity of solutions</p> <p>5. Designate various causes of incompatibility and their remedies with suitable example.</p> <p>6. Explicate the factors influencing dermal penetration of drugs</p>
4	17BP104 17BP110	Pharmaceutical Inorganic Chemistry	<p>Upon completion of course student shall be able to –</p> <p>1. Be familiar with the origins of impurities and techniques for identifying them in inorganic medicines and medications.</p> <p>2. Recognize the significance of inorganic chemicals in medicine and pharmaceuticals</p> <p>3. Acknowledge about the role of fluoride in dental caries and importance of maintaining dental hygiene</p> <p>4. Familiarize with radiopharmaceuticals and its importance in therapy, diagnosis, treatment</p> <p>5. Identifying various ions present in the electrolyte and their role in maintaining the physiological acid-base balance</p>

2nd Sem B. Pharm

Sl No	Subject Code	Subject Name	Course Outcomes
1	17BP201 17BP207	Human Anatomy and	<p>Upon completion of this course the student should be able to –</p> <p style="text-align: right;"><i>(Signature)</i> N.M.</p>

PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

		Physiology - II	<ol style="list-style-type: none"> 1. Recall the nervous system & arrangement, and list the parts of the brain structure and functions. 2. Describe the physiology of the digestive system. 3. Demonstrate respiratory volumes and explain the mechanisms underlying the urinary and respiratory systems. 4. Interpret how the endocrine system regulates hormones and their functions to manage the body general activity. 5. Describe the reproductive system physiology, the genes and chromosomes.
2	17BP202 17BP208	Pharmaceutical Organic Chemistry -I	<p>Upon completion of the course student shall be able to -</p> <ol style="list-style-type: none"> 1. Illustrates Examples and increases Problem solving ability of student in IUPAC Nomenclature 2. Articulates Different Hybridization patterns of Organic compounds and Determining Various Aspects of Important organic reactions like elimination and addition reaction. 3. Inferring and summarizing various mechanisms and application of Pharmaceutically important compounds. 4. Interpreting various applications of Organic reactions in the field of Pharmacy and enumerates uses of selected organic compounds. 5. Sketching several characteristic reactions, steps involved and their application in synthetic chemistry of compounds such as acids and amines
3	17BP203 17BP209	Biochemistry	<p>Upon completion of this course the student should be able to -</p> <ol style="list-style-type: none"> 1. Recognize the functions of enzymes in catalysis, the significance of enzyme inhibitors in the development of novel medications, and the therapeutic and diagnostic uses of enzymes. 2. Recognize how nutrient molecules are metabolised under

PRINCIPAL

College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bangalore - 560 078.



Dayananda Sagar University
College of Pharmaceutical Sciences

			<p>normal and abnormal circumstances.</p> <ol style="list-style-type: none">3. Recognize the roles played by DNA in the production of RNAs and proteins as well as the genetic structure of the mammalian genome.4. Familiarize with the metabolic aspect of carbohydrate, protein, fats in detail5. significance of metabolic diseases in body and life style disorders due to it.
4	17BP204	Pathophysiology	<p>Upon completion of course student shall be able to –</p> <ol style="list-style-type: none">1. Relate the etiology and pathogenesis of the selected disease states.2. List signs and symptoms of the diseases. Associate the complications of the diseases.3. Identify most commonly encountered pathophysiological state and disease mechanism as well as any clinical testing requirements.4. State the etiology and effects of disease on the various organ systems.5. Identify compensation mechanisms that occur in response to trauma and disease.

S. S. S. N. M.

PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.




Dayananda Sagar University

College of Pharmaceutical Sciences

3rd Sem B. Pharm

Sl No	Subject Code	Subject Name	Course Outcomes
1	17BP301 17BP305	Pharmaceutical Organic Chemistry - II	Upon completion of the course the student shall be able to – <ol style="list-style-type: none">1. Summarizes different mechanisms and compares the reactivity of aromatic compounds.2. Outlining Various Aspects of Important organic reactions and Synthetic methods for few classes of organic compounds like Phenols, amines and acid.3. Deducing various analytical constants of fats and oils.4. Assessing various applications of Organic reactions in the field of Pharmacy and Categorize the uses of selected organic compounds which are polyaromatic.5. Exemplifying basic concepts of Cycloalkanes.
2	17BP302 17BP306	Physical Pharmaceutics - I	Upon the completion of the course student shall be able to – <ol style="list-style-type: none">1. Memorize the solubility expression and laws involved in solubility along with their limitations and applications2. Recall the states and properties of matter and apply the various physicochemical properties of drug molecules in dosage form3. Critique the concepts of surface and interfacial surface4. To categorize complexation and apply the role and concepts of complexation and protein binding5. Perceive the knowledge of pH, buffers and isotonic solution, outline their role in pharmaceutical preparations
3	17BP303 17BP307	Pharmaceutical Microbiology	Upon completion of the subject student shall be able to – <ol style="list-style-type: none">1. Explaining methods of identification, cultivation and preservation of various microorganisms


PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			<ol style="list-style-type: none"> 2. Assessing the importance and implementation of sterilization in pharmaceutical processing and industry 3. Learning sterility testing of pharmaceutical products. 4. Experimenting microbiological standardization of Pharmaceuticals. 5. Developing the cell culture technology and its applications in pharmaceutical industries.
4	17BP304 17BP308	Pharmaceutical Engineering	<p>Upon completion of the course student shall be able –</p> <ol style="list-style-type: none"> 1. To categorized and explain various unit operations involved in manufacturing of pharmaceuticals. 2. To relating the concepts of flow of fluids, size reduction and size separation 3. To summarize different mechanisms of heat transfer. 4. To attribute the various factors influencing mixing, filtration and centrifugation and also equipment. 5. To attribute the various preventive methods used for corrosion control in Pharmaceutical industries.

4th Sem B. Pharm

Sl No	Subject Code	Subject Name	Course Outcomes
1	17BP401	Pharmaceutical Organic Chemistry – III	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none"> 1. Annotate isomerism and classify stereoisomerism. 2. Identify and designate various conformations and configurations; their significance in pharm. Chemistry 3. Infer the concept of chirality, its resolution, and synthesis of stereoselective and stereospecific compounds 4. Enumerate the rules of nomenclature, and discuss the


PRINCIPAL
 College of Pharmaceutical sciences
 Dayananda Sagar University
 Kumaraswamy Layout,
 Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences


			synthesis, aromaticity and reactivity of heterocyclic compounds. 5. Synthetic approaches and uses of some important heterocyclic drug molecules.
2	17BP402 17BP406	Medicinal Chemistry – I	Upon the completion of the course student shall be able to 1. categorizing the chemistry of drugs with respect to their pharmacological activity 2. paraphrasing the drug metabolic pathways, adverse effect and therapeutic value of drugs 3. predicting the Structural Activity Relationship (SAR) of different class of drugs 4. tabulating the synthesis of some important class of drugs 5. interpreting the mechanism pathways of different class of medicinal compounds.
3	17BP403 17BP407	Physical Pharmaceutics – II	Upon completion of the subject student shall be able to – 1. Classification and detailed characterization of colloidal dispersions with their applications. 2. Applications of rheology in flow of liquids and deformation of solids. 3. Exemplify various theories of emulsions and suspensions with their classification and applications 4. Enumerate the fundamental and derived properties of powders and the methods to determine them. 5. Outline the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations.
4	17BP404 17BP408	Pharmacology – I	Upon completion of the course student shall be able – 1. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.

N.M.
PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			<ol style="list-style-type: none">2. To correlate the basic pharmacological knowledge with different drugs3. To Analyse the pharmacological actions of different categories of drugs4. To highlight the mechanism of drug action at organ system/sub cellular/ macromolecular levels.5. Observe the adverse effects, and actions of drugs and emphasize the knowledge of drugs
5	17BP405 17BP409	Pharmacognosy & Phytochemistry - I	<p>Upon completion of the course, the student shall be able –</p> <ol style="list-style-type: none">1. To examine the Quality control of crude drugs along with the classification of crude drugs.2. To implement the conservation of tropical medicinal plants along with the cultivation of medicinal plants3. To summarize plant tissue culture and its applications4. To identify the secondary metabolites and their uses along with traditional systems of medicine5. To compare the chemical nature and uses of primary metabolites, fibres, Hallucinogens, and allergens from natural origin


PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University

College of Pharmaceutical Sciences

5th Sem B. Pharm

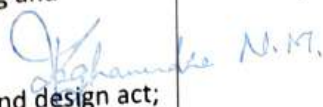
Sl No	Subject Code	Subject Name	Course Outcomes
1	17BP501	Medicinal Chemistry II	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none">1. To classify and correlate the chemistry of drugs with respect to their pharmacological activity.2. Well familiar with the creation of some important class of drugs with medicinal use.3. A comprehensive understanding of mechanisms of action of the drug, structure-activity relationships (SAR).4. To associate the chemical structure of the drug with biological activity.5. To study the adverse effect and therapeutic value of drugs.
2	17BP502 17BP506	Formulative Pharmacy	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none">1. Outline the importance of pre-formulation in development of pharmaceutical dosage forms and illustrate the stability studies on different dosage forms2. Annotate the formulation, formulation requirement, manufacturing techniques and evaluation of tablets and liquids.3. Analyse the role of Capsules and Pellets in Pharmaceutical industry4. Estimate the importance of formulation requirement, method of preparation and sterility of sterile dosage form.5. Recapitulate the formulation, method of preparation and evaluation of cosmetics, Pharmaceutical Aerosols

PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			and summarize the use of packaging materials.
3	17BP503 17BP507	Pharmacology – II	Upon completion of the course the student shall be able to <ol style="list-style-type: none">1. To explore the mechanism of drug action and its relevance in the treatment of different heart diseases2. To correlate pharmacology with related blood concerned diseases.3. To value the relation between different class of drugs, their actions and comparisons.4. To recognize the actions, adverse effects and applications of different drugs.5. To assess the bioassay of different chemicals and their applications.
4	17BP504 17BP508	Pharmacognosy and Phytochemistry- II	Upon completion of the course, the student shall be able <ol style="list-style-type: none">1. To attribute the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents2. To structure the preparation and development of herbal formulation.3. To review the herbal drug interactions4. To organise the isolation and identification of phytoconstituents.5. To assess the isolation and identification of phytoconstituents.
5	17BP505	Pharmaceutical Jurisprudence	Upon completion of the course, the student shall be able to understand – <ol style="list-style-type: none">1. Practice the Professional ethics;2. Retrieve the various concepts of the pharmaceutical legislation in India;3. Estimate the various parameters in the Drug and Cosmetic Act and rules;4. Summarize the Drug policy, DPCO, Patent and design act;


PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078

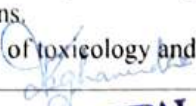


Dayananda Sagar University College of Pharmaceutical Sciences

			<p>5. Choose the labelling requirements and packaging guidelines for drugs and cosmetics;</p> <p>6. Gather the concepts of Dangerous Drugs Act, Pharmacy Act and Excise duties Act; and</p> <p>7. Interpret other laws as prescribed by the Pharmacy Council of India from time to time including International Laws.</p>
--	--	--	---

6th Sem B. Pharm

Sl No	Subject Code	Subject Name	Course Outcomes
1	17BP601 17BP607	MEDICINAL CHEMISTRY III THEORY	<p>Upon completion of the course the student shall be able to –</p> <ol style="list-style-type: none"> To synthesize and associate the chemistry of drugs with respect to their biological activity. To recognize the metabolism, adverse effects and therapeutic value of drugs. To make out the importance of SAR of drugs and correlating with biological activity of the drug. To be well familiar with Quantitative structure-activity relationship (QSAR), Molecular modeling, Virtual screening & docking. Emphasis on combinatorial library design and computer aided drug design (CADD).
2	17BP602 17BP608	PHARMACOLOGY III THEORY	<p>Upon completion of the course the student shall be able to –</p> <ol style="list-style-type: none"> To value the drugs & basic pharmacology and their therapeutic applications. To observe the fundamentals of toxicology and


PRINCIPAL
 College of Pharmaceutical Sciences
 Dayananda Sagar University
 Ramaswamy Layout,
 Bengaluru - 560 078.



Dayananda Sagar University
College of Pharmaceutical Sciences

			<p>to treat various poisonings.</p> <p>3. To Considerate toxicological principles and to handle different poisonings</p> <p>4. To Explore the relation between pharmacology and other medical sciences and to understand the risk profile of each medicine.</p> <p>5. Emphasizing the knowledge in the field of pharmacology pertaining on the drugs and its therapeutic applications on human.</p>
3	17BP603 17BP609	HERBAL DRUGTECHNOLOGY- THEORY	<p>Upon completion of the course the student shall be able to –</p> <ol style="list-style-type: none">1. To identify the raw materials as a source of herbal drug from cultivation to herbal drug formulation including different systems of Indian medicine.2. Analyse the health benefits of plants as nutraceuticals and elaborate on the herb-food and herb-drug interactions.3. Categorize the various excipients for preparation of cosmetics from herbal origin and novel dosage forms.4. Implementation of WHO and ICH guidelines for evaluation of herbal drugs and outline the patenting of herbal drugs.5. Explain present status and prospects of herbal drug-based industry and components of Good Manufacturing Practice for Indian systems of medicine.
4	17BP604	BIOPHARMACEUTICS AND PHARMACOKINETIC S -THEORY	<p>Upon completion of the course, the student shall be able to-</p> <ol style="list-style-type: none">1. To summarizing the mechanisms, interpret various factors affecting drug absorption, distribution.2. Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug metabolism, excretion, elimination.3. To determining the pharmacokinetic models for the pharmacokinetic parameters and one compartment model.4. To correlating the calculation of loading and maintenance doses. And also two compartment model5. To choosing factors causing Non-linearity

PRINCIPAL
College of Pharmaceutical sciences,
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

5	17BP605	PHARMACEUTICAL BIOTECHNOLOGY-THEORY	<p>Upon completion of the course, the student shall be able to –</p> <ol style="list-style-type: none"> 1. To summarize the importance of Immobilized enzymes in Pharmaceutical Industries 2. To link genetic engineering applications in relation to the production of pharmaceuticals 3. To review the hybridoma technique to produce monoclonal antibodies & to summarize immunity, bacterial and viral vaccines blood and plasma substitute 4. To review Immunoblotting techniques, biotransformation, mutation, and genetic transfer in bacteria 5. To experiment with the use of microorganisms in fermentation technology
6	17BP606	QUALITY ASSURANCE-THEORY	<p>Upon completion of the course, the student shall be able to –</p> <ol style="list-style-type: none"> 1. Demonstrate the concepts of quality assurance and total quality management. 2. Critique the importance of documentation 3. Illustrate the design, construction and layout of pharmaceutical Industries 4. Outline the role and responsibilities of quality assurance and quality control departments 5. Analyse the validation of various instruments.

7th Sem B. Pharm

Sl No	Subject Code	Subject Name	Course Outcomes
1	17BP701 17BP705	INSTRUMENTAL METHODS OF ANALYSIS - THEORY	<p>Upon completion of the course the student shall be able to –</p> <ol style="list-style-type: none"> 1. Enumerate the principles and applications of various spectroscopic techniques like UV, IR, Fluorimeter, flame

PRINCIPAL

**College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.**



Dayananda Sagar University
College of Pharmaceutical Sciences

			<p>photometer, atomic absorption spectroscopy, nepheloturbidometry.</p> <ol style="list-style-type: none">2. Illustrate instrumentation and working of the above spectrophotometers3. Describe various chromatography techniques and its type like adsorption, partition, TL, PC, HPLC, GC, Electrophoresis etc. along with their applications4. Discuss the concept of absorption, ion exchange, gel and affinity chromatography5. Perform Quantitative and qualitative analysis of the compounds using these techniques
2	17BP702	INDUSTRIAL PHARMACY- THEORY	<p>Upon completion of the course the student shall be able to –</p> <ol style="list-style-type: none">1. Demonstrate the general considerations and the operational steps of pilot plant scale up techniques2. Explain the different laws and acts that regulate pharmaceutical industry3. Recognize the steps involved in technology transfer from R&D to production.4. Illustrate the common measures use in quality5. Categorize the general requirements for submission of application for issue of Certificate of Pharmaceutical Product (COPP).
3	17BP703	PHARMACY PRACTICE - THEORY	<p>Upon completion of the course the student shall be able to –</p> <ol style="list-style-type: none">1. Categorize and choose various drug distribution methods in a hospital2. Preparing for the pharmacy stores management and inventory control3. Monitor drug therapy of patient through medication chart review and clinical review4. Obtain & interpret the medication history interview and present the counseling to the patients5. Expressing drug-related problems & assessing the adverse drug reactions6. Associating selected laboratory results (as monitoring parameters in therapeutics) for specific disease states7. Building the pharmaceutical care services by promoting the concept of rational drug therapy
4	17BP704	NOVEL DRUG DELIVERY SYSTEM-	<p>Upon completion of the course, the student shall be able</p> <ol style="list-style-type: none">1. Demonstrate various approaches for development of novel drug delivery systems.

PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar Uni
Kumaraswamy Layo
Bengaluru - 560 078



Dayananda Sagar University College of Pharmaceutical Sciences

		THEORY	<p>2. Analyse the criteria for selection of drugs and polymers for developing novel drug delivery systems.</p> <p>3. Illustrate the basic components of transdermal and mucosal drug delivery systems.</p> <p>4. Outline the various carriers used for drug targeting.</p> <p>5. Elaborate the development and applications of intrauterine drug delivery systems.</p>
--	--	--------	--

8th Sem B. Pharm

Sl No	Subject Code	Subject Name	Course Outcomes
1	17BP801	BIOSTATISTICS AND RESEARCH METHODOLOGY	<p>Upon completion of the course the student shall be able to –</p> <ol style="list-style-type: none"> 1. Know the various statistical methods to solve different types of problems 2. Operate various statistical software packages 3. Understand the importance of Computer in hospital and Community Pharmacy 4. Appreciate the statistical technique in solving the pharmaceutical problems
2	17BP802	SOCIAL AND PREVENTIVE PHARMACY	<p>Upon completion of the course the student shall be able to –</p> <ol style="list-style-type: none"> 1. Present alternative ways of solving problems related to health 2. Ability to apply general principles of prevention and control of disease. 3. Highlight the objective, functioning and outcomes of national health programs 4. Summarize the principles of National Health Intervention programs

S. S. Srinivas
PRINCIPAL

**College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.**



Dayananda Sagar University
College of Pharmaceutical Sciences

			5. Ability to provide community services in rural, urban and school health.
3	17BP803	PHARMACEUTICAL MARKETING	Upon completion of the course the student shall be able to – <ol style="list-style-type: none">1. Basic concepts and scope of marketing, analysing consumer and industrial buying behaviours.2. Analyse the qualitative, quantitative, size, composition, demographic descriptions, sociopsychological characteristics of consumer. Motivation and prescribing habits of physician, patient's choice of physician.3. Enumerate the various aspects of product decision, product life cycle and product management in pharmaceutical industry.4. Emphasize on Pharmaceutical marketing strategies and roles and duties of professional sales representatives5. Explicate various pricing strategies and emerging concepts in vertical, horizontal, rural and global marketing.
4	17BP804	PHARMACEUTICAL REGULATORY SCIENCE	Upon completion of the course, the student shall be able <ol style="list-style-type: none">1. Illustrate about the process of drug discovery and development2. Enumerate the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals3. Outline the regulatory approval process and their registration in Indian and international markets

PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

5	17BP805	PHARMACOVIGILANCE	Upon completion of the course, the student shall be able to understand – 1. Detection of new adverse drug reactions and their assessment. 2. Illustrate international standards for classification of diseases and drugs. 3. Manage Adverse drug reaction reporting systems and communication in pharmacovigilance
	17BP806	QUALITY CONTROL AND STANDARDIZATIONS OF HERBALS	Upon completion of the course, the student shall be able to understand – 1. To memorize WHO guidelines for quality control of herbal drugs 2. To implement cGMP, GAP, GACP, GMP, and GLP in the traditional system of medicine. 3. To summarize EU and ICH guidelines for quality control of herbal drugs and to summarize Research Guidelines for Evaluating the Safety and Efficacy of Herbal Medicines 4. To determine Stability testing of herbal medicines & various chromatographic techniques for standardization of herbal drugs & to gather documents for NDA along with GMP requirements and Drugs & Cosmetics Act provisions. 5. To execute the regulatory approval process and their registration in Indian and international markets.
	17BP807	COMPUTER AIDED DRUG DESIGN	Upon completion of the course, the student shall be able to understand – 1. Describe drug discovery, and various approaches used for it. 2. Define lead, lead discovery and lead optimization including bioisosterism. 3. Illustrate QSAR- its approaches and its types (2D, 3D, CoMFA, CoMSIA)

S. S. Srinivas
PRINCIPAL

College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University
College of Pharmaceutical Sciences

			<ol style="list-style-type: none">4. Define the concept of virtual screening, its types (SBDD & LBDD), pharmacophore based drug designing their advantages and limitations. Importance of molecular mechanics and quantum mechanics in molecular modelling.5. Discuss the fields of Bioinformatics and Cheminformatics
17BP808	CELL AND MOLECULAR BIOLOGY		<p>Upon completion of the course, the student shall be able to understand –</p> <ol style="list-style-type: none">1. Explain cell and molecular biology history.2. Understand cellular functioning and composition.3. Describe the chemical foundations of cell biology.4. Summarize the DNA properties of cell biology.5. Estimate protein structure and function.6. Explore cellular membrane structure and function.7. Describe basic molecular genetic mechanisms and summarize the Cell Cycle
17BP809	COSMETIC SCIENCE		<p>Upon completion of the course, the student shall be able to understand –</p> <ol style="list-style-type: none">1. Memorize the definition of cosmetics according to regulatory bodies, recall the evolution of cosmetics and cosmetic excipients and remember the basic structure of skin and hair and problems associated with oral cavity2. Annotate the basic principles of formulation requirement and building blocks of hair care, skin care and oral care products3. Elaborate the importance of SPF, infer the role of herbs in cosmetics and describe the analytical techniques of cosmetics4. Examine cosmetic preparation for skin and hair using different analytical methods5. Outline the problems associated with hair, scalp and skin.

S. Ghosh N.M.
PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078



Dayananda Sagar University
College of Pharmaceutical Sciences

17BP810	EXPERIMENTAL PHARMACOLOGY	Upon completion of the course, the student shall be able to understand – <ol style="list-style-type: none">1. To value the applications of various commonly used laboratory animals.2. To Analyse the various screening methods used in preclinical research.3. To Assess the importance of biostatistics and research methodology.4. Design and execute a research hypothesis independently5. Highlight the screening methods of each ailment.
17BP811	ADVANCED INSTRUMENTATION TECHNIQUES	Upon completion of the course, the student shall be able to understand – <ol style="list-style-type: none">1. Interpret and elucidate the structure of organic compounds using NMR and Mass spectrometry.2. Apply the concepts of X ray diffraction and thermal analysis techniques.3. Calibrate and validate the instruments as per the ICH guidelines.4. Discuss the principle and procedure involved in the solid and liquid phase extraction.5. Describe the importance of Hyphenated techniques.
17BP812	DIETARY SUPPLEMENTS AND NEUTRACEUTICALS	Upon completion of the course, the student shall be able to understand – <ol style="list-style-type: none">1. To review the need of supplements by the different group of people to maintain healthy life.2. To validate the outcome of deficiencies in dietary supplements.3. To assess the factors that influence the health issues.4. To appreciate the components in dietary supplements and the application.5. To structure the regulatory and commercial aspects of dietary supplements including health claims.

N.M.
PRINCIPAL

College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University
College of Pharmaceutical Sciences



Dayananda Sagar University

College of Pharmaceutical Sciences

Course Outcomes- Pharm.D

1st Year Pharm. D

Sl No	Subject Code	Subject Name	Course Outcomes
1	15PD101	Human Anatomy and Physiology	Upon completion of the course the student shall be able to: 1. Elaborate the various morphology, structure of various cells of body and to group the various tissues of human body and cells and haematology. 2. Summarize about the functions and disorders of different organs of each system. 3. To assess the coordinated working pattern of different organs of each system. 4. To correlate the structure and functions of different organs of different systems and sense organs. 5. To analyse the structure, functions and disorders of nervous system.
2	15PD102 15PD172	Pharmaceutics (Theory and Practical)	Upon the completion of the course the student should be able to: 1. Illustrate the different parts of a prescription with their significance and various operational aspects in compounding and dispensing of a prescription. 2. Critique on different pharmaceutical calculation involved in formulation and explore the rules to prepare and dispense of various types of powders 3. Elucidate the various excipients used in liquid orals and enumerate the identification.

PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University
College of Pharmaceutical Sciences

			<p>precautions on instabilities of biphasic liquids</p> <p>4. Estimate the percentage of solutions by allegation method, Convert the solutions to proof spirit, find out the isotonicity of solutions</p> <p>5. Designate various causes of incompatibility and their remedies with suitable example.</p>
3	15PD103 15PD173	Medicinal Biochemistry (Theory and Practical)	<p>Upon completion of the subject student shall be able to –</p> <ol style="list-style-type: none">1. Outlining the concepts of catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases2. Categorizing the metabolic pathways of biomolecules with their degradation process and also (metabolic disorders).3. Summarizing the concepts of genetic organization of mammalian genome; protein synthesis; replication; mutation and repair mechanism4. Interpreting the biochemical principles and results of organ function tests of kidney, liver and endocrine glands.5. Discussing the Principle and procedure for determination of biomolecules in the body fluids.
4	15PD104 15PD174	Pharmaceutical Organic Chemistry (Theory and Practical)	<p>Upon completion of the subject student shall be able to impart a very good knowledge about</p> <ol style="list-style-type: none">1. Illustrates rules of IUPAC Nomenclature and its applications. Demonstrates Different Hybridization patterns of Organic compounds.2. Describes Various Aspects and applications

[Signature]
PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Mammaswamy Layout,
Bangalore - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			<p>of Important organic reactions like substitution, Elimination and Reaction intermediates.</p> <ol style="list-style-type: none">3. Discusses and summarizes few classes of organic compounds along with the reactions they undergo, their orbital picture and applications.4. Demonstrates various applications of Organic reactions in the field of Pharmacy like Aromatic substitution and Nucleophilic addition.5. Explains several characteristic Properties, steps involved in their preparation and reaction and their application in synthetic chemistry.
5	15PD105 15PD175	Pharmaceutical Inorganic Chemistry (Theory and Practical)	<p>Upon completion of the course student shall be able to:</p> <ol style="list-style-type: none">1. Be familiar with the origins of impurities and techniques for identifying them in inorganic medicines and medications.2. Recognize the significance of inorganic chemicals in medicine and pharmaceuticals3. Acknowledge about the role of fluoride in dental caries and importance of maintaining dental hygiene4. Familiarize with radiopharmaceuticals and its importance in therapy, diagnosis, treatment5. Identifying various ions present in the electrolyte and their role in maintaining the physiological acid-base balance

N.M.
PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar Univ
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University
College of Pharmaceutical Sciences

2nd Pharm. D

Sl No	Subject Code	Subject Name	Course Outcomes
1	15PD201	Pharmacology -I	Upon completion of the subject student shall be able to (Know, do, appreciate) – <ol style="list-style-type: none">1. Define pharmacology, its subfields, and the numerous drug delivery methods with their corresponding benefits and drawbacks.2. Recognize the fundamental ideas behind the pharmacokinetics and pharmacodynamics of pharmacological compounds.3. Describe the steps in the development of novel medications and the principles of drug discovery.4. Examine how various drug categories affect important organ systems such the ANS, CVS, CNS, respiratory system, hormones, and opiates.5. Analyze negative effects and (possible or likely) drug interactions after drug consumption.
2	15PD202 15PD272	Pharmaceutical Microbiology (Theory & Practical)	Upon completion of the subject student shall be able to – <ol style="list-style-type: none">1. Understand the microscopy, identification, growth factors and sterilization of microorganisms;2. Know the mode of transmission of disease-causing microorganism, symptoms of disease, and treatment aspect;3. Estimate RNA and DNA and there by identifying

PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078



Dayananda Sagar University College of Pharmaceutical Sciences

			<p>the source;</p> <p>4. Cultivate and identify the microorganisms in the laboratory;</p> <p>5. Test organisms by performing the diagnostic tests; and appreciate the behaviour of motility and behavioural characteristics of microorganisms.</p>
3	15PD203 15PD271	Pharmacognosy and Phytopharmaceuticals (Theory & Practical)	<p>Upon completion of the course student shall be able to:</p> <ol style="list-style-type: none">1. Annotate the basic principles involved in cultivation, collection and storage of crude drugs.2. Identify the source, active constituents and uses of crude drugs and classify them.3. Distinguish and recognize the diagnostic characters of plants and evaluate them.4. Enumerate the various primary metabolites of the plant and the crude drugs under them.5. Detect the adulteration and contamination in crude drugs and identify the plant fibers for surgical dressing.
4	15PD204	Community Pharmacy	<p>Upon completion of the course, the student shall be able to –</p> <ol style="list-style-type: none">a) Summarize the roles and responsibilities of a community pharmacist.b) Prepare the requirements for community pharmacy management along with inventory control.c) Implement pharmaceutical care services; provide general patient counseling and health screening services to the patient, and a check on improving patient medication adherence.

PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University
College of Pharmaceutical Sciences

			<p>d) Choose the concept of rational drug therapy.</p> <p>e) Implement the code of ethics for community pharmacist and respond to symptoms of minor ailments.</p>
5	15PD205	Pathophysiology	<p>Upon completion of the subject student shall be able to –</p> <p>a) Present the basic pathogenesis of human disease</p> <p>b) Define and explore the most common aetiologies and predisposing factors associated with human disease</p> <p>c) Illustrate the basis for some laboratory tests and other diagnostic procedures</p> <p>d) Correlate between pathophysiology and clinical skills they are learning in their allied health science programs.</p> <p>e) Summarize how the various organ systems are interrelated, and use this understanding to promote a holistic approach towards the evaluation and treatment of patients.</p>
1.	15PD206	Pharmacotherapeutics-I	<p>Upon completion of the subject student shall be able to –</p> <p>1) Comprehend and retrieve the etiopathogenesis and pharmacotherapy of cardiovascular illnesses.</p> <p>2) Highlight and infer the diagnostic parameters involved in the management of respiratory diseases and various therapeutics options for the management of endocrine diseases.</p> <p>3) Illustrate and utilize patient-centered treatment by adopting evidence-based medicine to diverse patient population.</p>

[Signature] N.M.
PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.

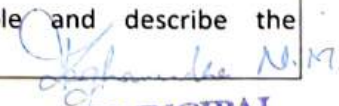


Dayananda Sagar University College of Pharmaceutical Sciences

			<p>4) Outline the pathophysiological approach and management involved in ophthalmologic illnesses.</p> <p>5) Summarize and demonstrate the role of pharmacist in essential and rational drug use.</p>
--	--	--	---

3rd Year Pharm. D

Sl No	Subject Code	Subject Name	Course Outcomes
1	15PD301 15PD371	Pharmacology II (Theory & Practical)	<p>Upon completion of the subject student shall be able to:</p> <ol style="list-style-type: none"> 1. Underline drugs acting on blood, chemotherapy, anti-microbial agents, advanced gene therapy, immunotherapy. 2. Compare pharmacological aspects of drugs acting on blood and renal system and pharmacology of immunosuppressant and principles of animal toxicology. 3. Illustrate the chromosome structure and DNA replication 4. Interpret the fundamentals and importance of cell biology in cell signalling pathway 5. Analyse the principles and processes of Recombinant DNA technology.
2	15PD302 15PD372	Pharmaceutical Analysis (Theory & Practical)	<p>Upon completion of the course the student shall be able to –</p> <ol style="list-style-type: none"> 1. Measure and estimate the amount of drug present in the sample and describe the


PRINCIPAL
 College of Pharmaceutical sciences
 Dayananda Sagar University
 Kumaraswamy Layout
 Bangalore - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			<p>construction and working of UV and IR Spectroscopy.</p> <ol style="list-style-type: none">2. Separate and identify the mixture of samples by various Chromatographic techniques.3. Select and apply a suitable concentration to construct the calibration curve by Fluorimetry and Flame Photometry.4. Demonstrate the different types of titrations under Electrometric methods.5. Discuss the concepts of quality control and validation according to the guidelines.
3	15PD303 15PD373	Pharmacotherapeutics II (Theory & Practical)	<p>Upon completion of the subject student shall be able to –</p> <ol style="list-style-type: none">a) Summarizing the causes of resistance to antimicrobials and antibiotics, combination treatment profile, its Drug Interaction (DI), and Adverse Drug Reactions (ADR), as well as the therapeutic choice of prophylaxis/treatment.b) Comprehensive measures of various protozoa, viral, and fungi infections, along with their co-morbid situation of proliferation, and an approaches towards the preventions, treatments, and management aspects of the same, together with their DI and ADRc) Learning more about the clinical knowledge relating to the causes of muscle and cartilage disorders, with a focus on the preventions, treatments, and management of DI and ADR event outcomes.

Abhambika N. H.
PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bangalore - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences


			<p>d) Categorizing & correlating acute and chronic renal disease and disorders, sepsis and its complications, and the treatment associated dialysis. A concrete focus on the antibiotic regimen, validating drug induce renal affects and its DI and ADR characteristics.</p> <p>e) Determining the various stages/levels of cancer and establishment of effective chemotherapy including ADR, DI, and the instant of recovery.</p>
4	15PD304	Pharmaceutical Jurisprudence (Theory)	<p>Upon completion of the subject student shall be able to (Know, do, and appreciate) –</p> <p>a. Practice the Professional ethics;</p> <p>b. Retrieve the various concepts of the pharmaceutical legislation in India;</p> <p>c. Estimate the various parameters in the Drug and Cosmetic Act and rules;</p> <p>d. Summarize the Drug policy, DPCO, Patent and design act;</p> <p>e. Choose the labelling requirements and packaging guidelines for drugs and cosmetics;</p> <p>f. Gather the concepts of Dangerous Drugs Act, Pharmacy Act and Excise duties Act; and</p> <p>g. Interpret other laws as prescribed by the Pharmacy Council of India from time to time including International Laws.</p> <p>h. Summarize prescription and non-prescription products</p>
5	15PD305 15PD374	Medicinal Chemistry (Theory & Practical)	<p>Upon completion of the course, students are able –</p> <p>1. To visualise the concepts of drug design</p>

[Signature]
PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			<p>techniques (includes CADD)</p> <ol style="list-style-type: none">2. To predict the concepts of Structural activity relationship for medicinal drugs. (Includes structural relationship with respect to biological activity)3. To validate medicinal compounds structurally and therapeutically.4. To Memorising the medicinal class of agents with simple and advanced techniques.5. Summarize the mechanism of action, mode of resistance, therapeutic uses and side effects of medicinal drugs.
6	15PD306 15PD375	Pharmaceutical Formulations (Theory & Practical)	<p>Upon completion of the subject student shall be able to (Know, do, appreciate) –</p> <ol style="list-style-type: none">1. Outline the principle involved in formulation of various pharmaceutical dosage forms2. Demonstrate the formulation and characterization of tablet dosage form.3. Illustrate the production and filling of capsules.4. Explicate the formulation and evaluation of emulsions and suspensions.5. Elaborate the production and quality control test for parenterals.6. Discuss the concepts and approaches used for preparing various novel drug delivery systems.


PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

4th Year Pharm. D

Sl No	Subject Code	Subject Name	Course Outcomes
1	15PD401 15PD47 1	Pharmacotherapeutics III	Upon completion of this subject it is expected that students will be able to understand – a) Design the dosage regimen for diseases; b) Illustrate the preparation of individualized therapeutic plans based on diagnosis; c) Identify and determine the patient-specific parameters relevant to initiating drug therapy. d) Summarize the therapeutic approach to manage the diseases condition e) Assess the rationality of drug therapy
2	15PD402 15PD47 2	Hospital Pharmacy	Upon completion of the course, the student shall be able to – a. Categorize various types of hospitals and summarize the organization and management of hospital pharmacy b. Implement budget preparation and promote hospital drug policy. c. Present unbiased drug information to the doctors and hospital pharmacy services. d. Implement the manufacturing practices of various formulations in hospital set up. e. Promote hospital drug policy and summarize the handling and packaging of radio pharmaceuticals. f. Implement continuous pharmacy education and professional development programs..
3	15PD403 15PD47	Clinical Pharmacy	Upon completion of the subject student shall be able to (Know, do, appreciate) –

Principals
PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bangalore - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

3			<p>a. Monitor & Finding drug therapy of patient through medication chart review and clinical review;</p> <p>b. Obtain & organising medication history interview and counsel the patients;</p> <p>c. Identify and resolve drug related problems;</p> <p>d. Detect, assess and monitor adverse drug reaction;</p> <p>e. Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states; and</p> <p>f. Retrieve, analyse, interpret and formulate drug or medicine information</p>
4	15PD404	Biostatistics Research Methodology	<p>& Upon completion of the course the student shall be able to:</p> <p>a. Know the various statistical methods to solve different types of problems</p> <p>b. Operate various statistical software packages</p> <p>c. Understand the importance of Computer in hospital and Community Pharmacy</p> <p>d. Appreciate the statistical technique in solving the pharmaceutical problems</p>
5	15PD405 15PD474	Biopharmaceutics Pharmacokinetics	<p>& Upon completion of the course the student shall be able to :</p> <ol style="list-style-type: none">1. Enumerate the various mechanisms involved in absorption, distribution, metabolism and excretion with emphasis on the various factors affecting them.2. Annotate the basic concept of plasma concentration-time profile with the study of various kinetic models.3. Applications of pharmacokinetic principles to one compartment and multicompartment

PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University
College of Pharmaceutical Sciences

			model. 4. Analyze and design the dosage regimen for patients with hepatic disease and renal failure. 5. Evaluation and assessment of bioavailability and bioequivalence studies
6	15PD406	Clinical Toxicology	Upon completion of the course student shall be able to – 1) Highlight and demonstrate the general working knowledge of clinical toxicology concepts and techniques. 2) Illustrate the clinical manifestations and management of acute poisoning with agents. 3) Demonstrate and utilize knowledge of fundamental concepts in general toxicology and clinical management involved in snake bite and heavy metals. 4) Comprehend and identify possible preventative measures to decrease accidental poisonings. 5) Outline and build the ability to contribute as a part of the medical team in situations involving substance abuse and dependence.

S. Srinivas N.M.

PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

5th Year Pharm. D

Sl No	Subject Code	Subject Name	Course Outcomes
1	15PD501	Clinical Research	<p>Upon completion of this course, the students will be able to –</p> <ul style="list-style-type: none">a) Categorise & summarizing the concept of the new drug development process.b) Understand the regulatory and ethical requirements.c) Judge the clinical trials following the regulatory and ethical requirements.d) Coordinate & facilitate the clinical trials and promote quality drug trial research.e) Adapt the safety monitoring and reporting in clinical trials
2	15PD502	Pharmacoepidemiology and Pharmacoeconomics	<p>Upon completion of this course, the students will be able to -</p> <ul style="list-style-type: none">a) Assessing the versatile ranges, various units of measurement, and patient adherence to medication doses with regard to prevalence, incidence, and incidence rate.b) Comprehensive rating of different pharmacoepidemiological risks, concepts for gathering diverse case studies/reports, their analysis, and their record-keeping procedures.c) Gaining statistical interpreting knowledge of

PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			<p>the data system's unique applications based on risk management and medication safety.</p> <p>d) Implementing a wealth of knowledge about efficient Pharmacoeconomic assessment and judgments based on community pharmacy through a variety of approaches and hands-on study of diverse methods using case studies.</p> <p>e) Executing of software applications that the student could interpret case studies based on them.</p>
3	15PD503	Clinical Pharmacokinetics and Therapeutic Drug Monitoring	<p>Upon completion of the course, the student shall be able to –</p> <p>a. Design the drug therapy regimen for individual patient and summarize the concepts of clinical pharmacokinetics</p> <p>b. Interpret and correlate the plasma drug concentration with patient's therapeutic outcome.</p> <p>c. Calculate dosage for patients with renal/hepatic impairment.</p> <p>d. Identify and manage drug –drug interactions.</p> <p>e. Predict the causes of unexpected drug responses using the concept of population pharmacokinetics and pharmacogenetics</p>

Abhambike N.M.

PRINCIPAL

College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University

College of Pharmaceutical Sciences

Course Outcomes – M. Pharm (Pharmaceutics)

1st Sem M. Pharm (Pharmaceutics)

Sl No	Subject Code	Subject Name	Course Outcomes
1	17MPH101	Modern Pharmaceutical Analytical Techniques	<p>Upon completion of this course, the students will be able to –</p> <ol style="list-style-type: none">1. Measure and estimate the amount of drug present in the sample by UV, IR, Fluorimetry and Flame Photometry and describe the components of analytical instruments.2. Apply the concepts of NMR and interpret the compound to elucidate the structure.3. Describe the various types of Ionization techniques, mass analyzers and interpret the compound by Mass spectrometry.4. Prefer the chromatographic method to separate and identify the mixture of compounds.5. Describe the types of electrophoresis and study the concepts of X-ray6. diffraction and Immunological assays.
2	17MPH102	Drug Delivery System	<p>Upon completion of this course, the students will be able to -</p> <ol style="list-style-type: none">1. Outline the concepts and factors influence the design of controlled release formulations.2. Envisage types of patients for personalized medicine.3. Demonstrate the formulation aspects and characterization of buccal drug delivery systems.4. Analyse the approaches to overcome the barriers of ocular drug delivery.

S. Srinivas
PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			<p>5. Demonstrate the formulation of transdermal drug delivery systems and their evaluation.</p> <p>6. Elaborate the various approaches for delivering protein and peptides.</p> <p>7. Explicate the various techniques for the transdermal and mucosal delivery of vaccines.</p>
3	17MPH103	Modern Pharmaceutics	<p>Upon completion of the course, the student shall be able to –</p> <ol style="list-style-type: none">1. Elucidate the preliminary evaluation test and elements required for pre-formulation studies.2. Implementation of ICH & WHO guidelines for calibration and validation of equipment's.3. Illustrate the key parts of Industrial management and policies of cGMP4. Explicate the physics of tablet making, giving special emphasis on distribution and measurement of forces involved in it.5. Critique on various consolidation parameters.
4	17MPH104	Regulatory Affairs	<p>Upon completion of the course, the student shall be able to –</p> <ol style="list-style-type: none">1. Annotate concepts of various regulatory agencies for filing and approval process of pharmaceuticals and documentation requirements of the same.2. Enumerate the ways and means of US registration for foreign drugs.3. Explicate the FDA liaisons and ICH guidelines-QSEM.4. Outline the regulatory requirements of IND, NDA and ANDA in non-clinical drug development.5. Applications of regulatory requirements in developing clinical trial

S. Hanumanth N. K.
PRINCIPAL



Dayananda Sagar University
College of Pharmaceutical Sciences

			protocols.
--	--	--	------------

S. S. S. S. S.
S. S. S. S. S.

PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumarswamy Layout,
Bangalore - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

2nd Sem M. Pharm (Pharmaceutics)

Sl No	Subject Code	Subject Name	Course Outcomes
1	17MPH201	Molecular Pharmaceutics	<p>Upon completion of this course, the students will be able to –</p> <ol style="list-style-type: none">1. Demonstrate various drug delivery systems for targeting drugs into the brain and tumour.2. Outline the applications of nanoparticles and liposomes in drug targeting.3. Explicate the preparation and characterization of carriers like aquasomes, phytosomes and electrosomes.4. Illustrate the various techniques for the pulmonary delivery of drugs.5. Outline the drug delivery systems for the delivery of genes for gene therapy.
2	17MPH202	Advanced Biopharmaceutics and Pharmacokinetics	<p>Upon completion of this course, the students will be able to -</p> <ol style="list-style-type: none">1. Enumerate the different types of mechanism of absorption and various types of factors influencing the drug mechanism from the GIT.2. Analyze the biopharmaceutic considerations in drug product design and In Vitro Drug Product Performance.3. Critique on the features of different types of pharmacokinetic models and importance of drug interactions.4. Explicate the design and purposes of bioavailability and bioequivalence studies of new drugs or dosage forms and biopharmaceutical classification system.5. Evaluation of Pharmacokinetics and pharmacodynamic



Dayananda Sagar University College of Pharmaceutical Sciences

			drug interactions.
3	17MPH203	Computer Aided Drug Delivery System	<p>Upon completion of the course, the student shall be able to –</p> <ol style="list-style-type: none">1. Outline the history of computers in Pharmaceutical R & D, annotate the modelling techniques and implement the knowledge of QbD in Pharmaceutical preparations2. Memorize and implement the computational modeling techniques of drug disposition3. Infer the concept of optimization and screening design, summarize the legal protection of innovations and ethics in research, analyse the role of computers in market analysis4. Implement the role of gastrointestinal absorption simulation, determine the importance of computers in PK and PD simulations and clinical development5. Interpret the role of Artificial intelligence, robotics and computational fluid dynamics in Pharmaceuticals.
4	17MPH204	Cosmetic and Cosmeceuticals	<p>Upon completion of the course, the student shall be able to –</p> <ol style="list-style-type: none">1. Critique the various regulations governing the manufacture, sale, import and labelling of cosmetics and obtaining the license for the same.2. Summarize the biological aspects of problems relating to skin, hair and oral cavity.3. Applications of emollients, surfactants, antimicrobials as building blocks of cosmetics in various cosmetic formulations. Classify perfumes

[Signature]
PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			and list perfume ingredients as allergens in EU regulation.
			4. Design of cosmeceutical products for skin, hair and oral care.


PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University
College of Pharmaceutical Sciences



Dayananda Sagar University

College of Pharmaceutical Sciences

Course Outcomes – M.Pharm Pharmacology

1st Sem M. Pharm (Pharmacology)

Sl No	Subject Code	Subject Name	Course Outcomes
1	17MPL101	Modern Pharmaceutical Analytical Techniques	<p>Upon completion of this course, the students will be able to –</p> <ol style="list-style-type: none">1. Measure and estimate the amount of drug present in the sample by UV, IR, Fluorimetry and Flame Photometry and describe the components of analytical instruments.2. Apply the concepts of NMR and interpret the compound to elucidate the structure.3. Describe the various types of Ionization techniques, Mass analyzers and interpret the compound by Mass spectrometry.4. Demonstrate the chromatographic method to separate and identify the mixture of compounds.5. Describe the types of Electrophoresis & Potentiometric titrations and apply the concepts of X-ray diffraction and Thermal methods.
2	17MPL102	Advanced Pharmacology-I	<p>Upon completion of this course, the students will be able to -</p> <ol style="list-style-type: none">1. Appreciate the basic knowledge in the field of pharmacology apply to the drugs and its therapeutic solicitations2. Highlight the pathophysiology and pharmacotherapy of certain diseases3. Value the mechanism at the cellular and molecular level. <p><i>S. S. Srinivasan N.M.</i></p>

PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			<ol style="list-style-type: none">4. Recognize the negative effects, contraindications, and clinical applications of medications used to treat disorders.5. Analyse the detrimental consequences, contraindications, and medical applications of medications used to treat disorders.
3	17MPL103	Pharmacological and Toxicological Screening Methods - I	<p>Upon completion of the course, the student shall be able to -</p> <ol style="list-style-type: none">1. Justify the regulations and ethical requirements for the usage of experimental animals.2. Illustrate the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals3. Evaluate various in-vitro and in-vivo preclinical evaluation processes4. Review the various newer screening methods involved in the drug discovery process5. Interpret and correlate the preclinical data to humans
4	17MPL104	Cellular & Molecular Pharmacology - I	<p>Upon completion of the course, the student shall be able to -</p> <ol style="list-style-type: none">1. Underline various cellular events, functions, pathways and transduction mechanisms and how a gene is expressed.2. State cell signaling pathways based on receptors and second messengers in the cell.3. Illustrate Principles and applications of genomic, proteomic tools, gene therapy and rDNA technology.4. Name immunotherapeutic and application of omics in clinical practice.5. Relate principles and applications of various assays.

M. M.
PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			biosimilars, and cell culture techniques, application of flow cytometry.
--	--	--	--

S. Sankar N.M.

PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University

College of Pharmaceutical Sciences

2nd Sem M. Pharm (Pharmacology)

Sl No	Subject Code	Subject Name	Course Outcomes
1	17MPL201	Advanced Pharmacology – II	Upon completion of this course, the students will be able to – 1. Predict the mechanism of drug actions at cellular and molecular level 2. Reproduce the Pathophysiology and pharmacotherapy of certain diseases 3. Outline the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases 4. Elaborate the recent advances of drugs used in the treatment of various diseases. 5 Relate the concept of free radicals and antioxidants and their role in various disorders
2	17MPL202	Pharmacological & Toxicological Screening methods – II	Upon completion of this course, the students will be able to - 1. List the various types of toxicity studies. 2. Appreciate the importance of ethical and regulatory requirements for toxicity studies. 3. Demonstrate the practical skills required to conduct the preclinical toxicity studies.
3	17MPL203	Principles of Drug Discovery	Upon completion of the course, the student shall be able to – 1. Outline the various stages of drug discovery. 2. Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery 3. Demonstrate various targets for drug discovery. 4. Apply various lead seeking method and lead


PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.



Dayananda Sagar University College of Pharmaceutical Sciences

			optimization 5. Appreciate the importance of the role of computer aided drug design in drug discovery
4	17MPL204	Clinical Research & Pharmacovigilance	Upon completion of the course, the student shall be able to – <ol style="list-style-type: none">1. Outline the regulatory requirements for conducting clinical trial2. Demonstrate the types of clinical trial designs3. List the responsibilities of key players involved in clinical trials4. Execute safety monitoring, reporting and close-out activities5. Compile the principles of Pharmacovigilance6. Detect new adverse drug reactions and their assessment7. Perform the adverse drug reaction reporting systems and communication in Pharmacovigilance

Dayananda N.M.

PRINCIPAL
College of Pharmaceutical sciences
Dayananda Sagar University
Kumaraswamy Layout,
Bengaluru - 560 078.

2.6.1 : The institution has stated learning outcomes – Publized through the website

The screenshot shows the website for the College of Pharmaceutical Sciences at Dayananda Sagar University. The URL is dsu.edu.in/pharmacy. The page features a navigation menu with items like HOME, UNIVERSITY, ACADEMICS, ADMISSIONS, INTERNATIONAL, RESEARCH, INNOVATION, PLACEMENT, NAAC, LIBRARY, HOSTEL @ HAROHALLI, and CONTACT. The main heading is "COLLEGE OF PHARMACEUTICAL SCIENCES". Below this is a photograph of students in a laboratory setting. A sidebar on the right lists various links: About Pharmaceutical Sciences, Vision, Mission and Goals, PEO, PO, PSO, CO, Principal's Message, USP, Programs, and Library. At the bottom of the page, there is a footer with sections for ABOUT, SCHOOLS, and ADMISSIONS, along with the university's logo and name.

A Pharmacist for all your Medical Care.

Overview:

Dayananda Sagar College of Pharmacy was started in 1981 to cater to the needs of Pharmacy Education in India under Rajiv Gandhi University of Health Sciences, Karnataka. In the year 2015, the institution was renamed "College of Pharmaceutical Sciences" and merged as a branch of the School of Health Sciences, affiliated with Dayananda Sagar University. The college is recognized by PCI, New Delhi, and the Government of Karnataka. It is also a recognized Scientific and Industrial Organization by DSIR, Govt of India. The COPS offers B. Pharm, M. Pharm, PharmD, Ph.D. programs in Pharmaceutical Chemistry, Pharmacology, Pharmaceutics, Pharmacognosy, and Pharmaceutical Analysis. The College has vibrant clusters of innovation ecosystems focused on drug discovery and development; in collaboration with industrial partners and research organizations. It also has an excellent pharmacy practice department dedicated to the betterment of the healthcare community in association with Sagar Hospitals and Dr. Chandramma Dayananda Sagar Institute of Medical Education and Research.

- Calendar of Events
- Faculty
- Board of Studies
- Research Activities
- News & Events
- SIFD Submitted to PCI
- Partnerships and Collaborations
- Facilities
- Curricular Aspect
- Contact Us

Dayananda N. M.
PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Harohalli



COLLEGE OF PHARMACEUTICAL SCIENCES - VISION, MISSION AND GOALS

Vision

To be a premier institute in the field of Pharmaceutical Sciences by providing quality education, training and research for the benefit of society with the ultimate aim of providing proficient patient care and innovation in drug development to meet the global healthcare needs.

Mission

- To provide knowledge, necessary skills in the profession of Pharmacy through innovative practice
- To encourage staff & students to take up research activities in various facets of Pharmaceutical Sciences and Pharmacy practice
- To nurture team work to serve society by practicing and executing moral responsibilities associated with pharmaceutical

COLLEGE OF PHARMACY

- About Pharmaceutical Sciences
- Vision, Mission and Goals
- PEO, PO, PSO, CO
- Principal's Message
- USP
- Programs

GOALS AND OBJECTIVES

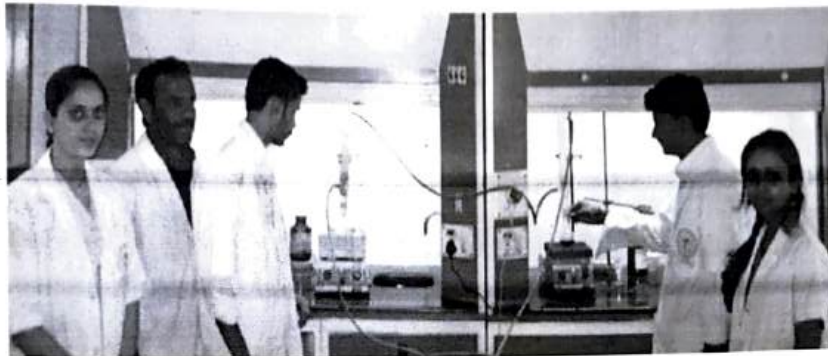
At college of Pharmaceutical Sciences, DSU, we offer programs B Pharm, PharmD, M.Pharm in Pharmaceutics, M.Pharm in Pharmacology, M.Pharm in Pharmaceutical Chemistry and Doctor of Philosophy (Pharmaceutical sciences)

The college of Pharmaceutical Science steers upon to accomplish the preset goals mentioned below through an effective and holistic approach with the necessary outcomes.

- To impart the required fundamental knowledge of Pharmaceutical Science wherein the learners effectively adept, to pioneer in the practice of Pharmacy profession.
- To equip with core scientific concepts enabling to resolve the contemporary scientific challenges; train them with methodological skills that lineate to design an appropriate model.
- To develop caliber in identifying the problem in the scientific task, enable them to explore and prioritize potential strategies and design, implement and evaluate a viable solution.
- To potentiate the abilities of interpersonal skills to envision them as an active healthcare team by demonstrating mutual respect, understanding and values to meet patient care need.
- To motivate as life-long learners and foster higher competency level to adapt to the rapid changes in the domain of Pharmaceutical Sciences
- To indoctrinate the managerial qualities required for optimum utility of human, technological, physical and financial resources in providing a safe, quality and efficacious healthcare system.

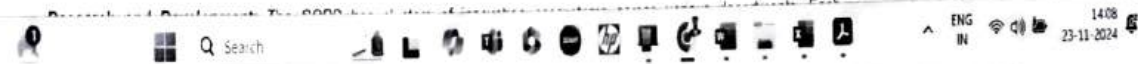
- Seats & Eligibility
- Calendar of Events
- Faculty
- Board of Studies
- Research Activities
- News & Events
- SIFD Submitted to PCI
- Partnerships and Collaborations
- Facilities
- Curricular Aspect
- Contact Us

USP



- COLLEGE OF PHARMACY
- About Pharmaceutical Sciences
- Vision, Mission and Goals
- PEO PO PSO CO
- Principal's Message
- USP
- Programs
- Library
- Seats & Eligibility

The College of Pharmaceutical Sciences (COPS) of Dayananda Sagar University, is a premier institution in India offering B. Pharm, M. Pharm and Pharm. D, and Ph D programs



development, therapies, and medical technologies.

- **Cutting-edge Technology:** COPS has state-of-the-art technology and advanced R&D infrastructure and facilities to innovate, design new drugs, optimise and develop them into high-quality clinically useful pharmaceutical products
- **Expertise and Specialization:** Faculties at COPS are trained and educated across the globe. We have a nice blend of postdocs, doctorates, and highly skilled industrial experts in our faculty group. We specialize in drug discovery, design, formulation and development of novel chemical entities or herbal drugs towards oncology, neurology, and infections. Our team of highly skilled experts is dedicated to advancing knowledge and treatments in these fields.
- **Pedagogy and Curriculum:** Our students are educated and trained by providing pedagogical instructions. Curriculum is designed to synergise the teaching efforts by organizing conferences, workshops, and skill development programs.
- **Collaboration and Partnerships:** COPS has many research activities that are in collaboration with academic institutions, research organizations, and other pharmaceutical companies to leverage collective expertise, share resources, and accelerate drug development processes.
- **Patient-Centric Approach:** COPS in collaboration with CDSIMER and Sagar Hospitals has many initiatives on understanding patient needs and developing therapies that improve patient outcomes and quality of life. This involves patient engagement programs, personalized medicine approaches, or patient support initiatives.
- **Sustainability and Social Responsibility:** COPS prioritize sustainable practices, ethical research, and environmental responsibility, aligning our R&D efforts with the broader goal of promoting public health and social well-being.

- Faculty
- Board of Studies
- Research Activities
- News & Events
- SIFD Submitted to PCI
- Partnerships and Collaborations
- Facilities
- Curricular Aspect
- Contact Us



PRINCIPAL
College of Pharmaceutical Sciences
Dayananda Sagar University
Harohalli



PROGRAMS UNDER COLLEGE OF PHARMACEUTICAL SCIENCES

College of Pharmaceutical Sciences offers four year of undergraduate(B Pharm), six years Pharm.D program and two year masters program (M.Pharma) in various branches along with doctoral program in pharmacy. The College comprises state of the art infrastructure and a highly qualified dedicated faculty.

UNDER GRADUATE PROGRAM:

- B. Pharm

POST GRADUATE PROGRAMS:

- Pharm. D
- M. Pharm

COLLEGE OF PHARMACY

- About Pharmaceutical Sciences
- Vision, Mission and Goals
- PEO, PO, PSO, CO
- Principal's Message
- USP
- Programs
- Library

infrastructure and a highly qualified dedicated faculty.

UNDER GRADUATE PROGRAM:

- B. Pharm

POST GRADUATE PROGRAMS:

- Pharm. D
- M. Pharm

DOCTORAL PROGRAMS (Ph.D):

- Ph.D

College of Pharmaceutical Sciences offers Ph.D programs in following specializations Under Dayananda Sagar University.

Specializations for Ph.D Program are follows

1. Specialization in Pharmaceutical Chemistry
2. Specialization in Pharmaceutics
3. Specialization in Pharmacology
4. Specialization in Pharmacognosy

- About Pharmaceutical Sciences
- Vision, Mission and Goals
- PEO, PO, PSO, CO
- Principal's Message
- USP
- Programs
- Library
- Seats & Eligibility
- Calendar of Events
- Faculty
- Board of Studies
- Research Activities
- News & Events
- SIFD Submitted to PCI
- Partnerships and Collaborations

Eligibility:

Programs Offered	Graduation	Eligibility
B.Pharm	UG	Pass in 10+2 with Physics, Chemistry and English with Mathematics or Biotechnology or Computer Science or Biology as optional subjects with a minimum of 40% marks in aggregate Lateral: Diploma holders in Pharmacy from an institution recognized by the Pharmacy Council of India.
Pharm. D	UG	Pass in 10+2 examination with Physics, Chemistry and English with Mathematics or Biology as optional subjects / DPharm or any other equivalent qualification recognized by the Pharmacy Council of India.
M.Pharm	PG	Candidates should have passed B.pharm from an institution recognized by the Pharmacy Council of India with a minimum of 50% marks in aggregate
Ph.D	Doctoral	<ol style="list-style-type: none"> 1. A candidate who has obtained Masters degree from Dayananda Sagar University or any other University recognized as equivalent securing not less than 50% of the aggregate marks prescribed for the examination, and passed entrance examination for the PhD degree course, shall be eligible for admission to the Ph. D Degree Course. 2. A candidate with M. Phil Degree of this University or any other University recognized as equivalent there to in the concerned or cognate subject shall also be eligible for admission to the Ph. D Degree course, after passing the entrance examination as prescribed.

- Programs
- Library
- Seats & Eligibility
- Calendar of Events
- Faculty
- Board of Studies
- Research Activities
- News & Events
- SIFD Submitted to PCI
- Partnerships and Collaborations
- Facilities
- Curricular Aspect
- Contact Us

SEATS & ELIGIBILITY

Seats:

Programs Offered	Graduation	Duration	Study Focus	Intake
B.Pharm	UG	4 years Course work+150 hours training	Industrial / Pharmacy Synthesis & Formulation of Drugs	100
Pharm. D	UG	5 years Course work+ 1 year Hospital Internship	Clinical Practice	30
M.Pharm	PG	2 years (1 year Course work+ 1 year Project work)	Research Oriented	27
Ph.D	Doctoral	—	Research Oriented	—

Eligibility:

Programs Offered	Graduation	Eligibility
B.Pharm	UG	<p>Pass in 10+2 with Physics, Chemistry and English with Mathematics or Biotechnology or Computer Science or Biology as optional subjects with a minimum of 40% marks in aggregate Lateral: Diploma holders in Pharmacy from an institution recognized by the Pharmacy Council of India.</p> <p>Pass in 10+2 examination with Physics, Chemistry and English with Mathematics or Biology as</p>

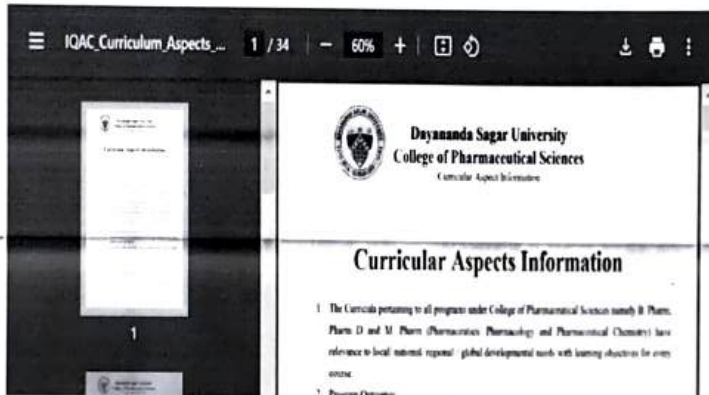
COLLEGE OF PHARMACY

- About Pharmaceutical Sciences
- Vision, Mission and Goals
- PED, PD, P30, CO
- Principal's Message
- USP
- Programs
- Library
- Seats & Eligibility
- Calendar of Events
- Faculty
- Board of Studies
- Research Activities

S. S. Srinivasulu N.M.T.
PRINCIPAL
 College of Pharmaceutical Sciences
 Dayananda Sagar University
 Harehalli



CURRICULAR ASPECT



COLLEGE OF PHARMACY

- About Pharmaceutical Sciences
- Vision, Mission and Goals
- PEO, PO, PSO, CO
- Principal's Message
- USP
- Programs
- Library

APPLY NOW

PEO, PO, PSO, CO

B. Pharm

PEO

- PEO-1 To help pharmacy graduates assimilate theoretical and practical knowledge backed with solid foundations and excellent technological expertise to serve the pharmaceutical industry's in various sectors.
- PEO-2 To prepare pharmacists to meet the challenges of the pharmacy profession and to contribute effectively to the social health care system.
- PEO-3 To foster the development of future pharmacists' leadership and entrepreneurship skills.
- PEO-4 Enhance the knowledge in formulation and dispensing of medicines for oral and parenteral route.

PO

- Learning abilities:** Recognize the need to have the preparation and ability to engage in professional continuous learning and utilize the same in their professional and personal life in the context of serving the society.

COLLEGE OF PHARMACY

- About Pharmaceutical Sciences
- Vision, Mission and Goals
- PEO, PO, PSO, CO
- Principal's Message
- USP
- Programs
- Library
- Seats & Eligibility
- Calendar of Events
- Faculty
- Board of Studies

APPLY NOW

the storage and distribution of pharmaceuticals with all necessary safeguards and in-depth understanding of dose, adverse effects, and other health-related issues

▪ **Research Analysis:** Students could use their expertise to conduct fresh study and make breakthroughs

▪ **Communication:** Communicate effectively with the public and with society about pharmaceutical activity

PSO

CO

CO

SYLLABUS

NEW SCHEME

2017-18 SCHEME

Pharm. D

Pharm. D

PEO

▪ PEO-1 To provide a comprehensive pharmaceutical education and hands-on training culminating in their integration with other health care professionals in the community and hospital settings.

▪ PEO-2 To prepare pharmacists to meet the challenges of the pharmacy profession and to contribute effectively to the social health care system.

▪ PEO-3 To adopt leadership skills as a member of a health-care team.

▪ PEO-4 To use the knowledge and skills earned for the betterment and upliftment of profession while fulfilling their social responsibilities.

PO

PSO

CO

S. S. Hanumanth N. M.
PRINCIPAL
College of Pharmaceutical Sciences,
Dayananda Sagar University,
Harohalli

- » PEO-4 To use the knowledge and skills earned for the betterment and upliftment of profession while fulfilling their social responsibilities

PO

PSO

CO

CO

SYLLABUS

2015-16 SCHEME

M. Pharm

PEO

PO

M. Pharm

PEO

- » PEO-1 To enhance in-depth and advanced knowledge of chosen pharmaceutical science
- » PEO-2 To introduce the expertise of pharmaceutical skills with by providing hands-on training via cutting-edge infrastructure and equipment.
- » PEO-4 To inculcate the logical thinking, inquisitiveness and yearning for research and development.
- » PEO-5 To indoctrinate future pharmacy professionals with leadership and entrepreneurial skills.

PO

PSO

CO

PO

PSO

CO

CO - M. Pharm (Pharmacology)

CO - M. Pharm (Pharmaceutics)

SYLLABUS

2017-18 SCHEME



ABOUT SCHOOLS ADMISSIONS

The University School of Engineering Admissions details



DAYANANDA SAGAR UNIVERSITY

S. Srinivasan N.M.
PRINCIPAL
College of Pharmaceutical Sciences,
Dayananda Sagar University
Harohalli