



Dayananda Sagar University

School of Engineering

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

DAYANANDA SAGAR UNIVERSITY

SCHOOL OF ENGINEERING



SCHOOL OF ENGINEERING

(A State Private University under the Karnataka Act No. 20 of 2013)

Approved by UGC & AICTE, New Delhi, Accredited by NAAC with A+ grade

**Department of Computer Science and Engineering
(Data Science)**

SCHEME FOR BACHELOR OF TECHNOLOGY (B. Tech)

Batch 2023-2027



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Definitions / Descriptions

Definition of Credit

1 Hour Lecture (L) Per Week	01 Credit
1 Hour Tutorial (T) Per Week	01 Credit
1 Hour Practical (P) Per Week	0.5 Credit
1 Hour Project (J) Per Week	0.5 Credit

Course code and Definition

BSC	Basic Science Courses
ESC	Engineering Science Courses
HSMC	Humanities and Social Sciences including Management Courses
IPCC	Integrated Professional Core Course
PCC	Professional Core Courses
PEC	Professional Elective Courses
OEC	Open Elective Courses
SEC	Skill Enhancement Courses
UHV	Universal Human Value Course
PROJ	Project Work
INT	Internship



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Implementation of National Education Policy (NEP) 2020 for the B.Tech students of Batch 2023-2027

The implementation of Curriculum follows NEP 2020 and addresses the following features and categories of courses:

1. Student Centric flexible curriculum.
2. Interdisciplinary Courses,
3. Multi-disciplinary Courses,
4. Ability Enhancement Courses,
5. Skill Enhancement Courses,
6. Value Added Courses,
7. Product Design and Development,
8. Internship (Rural Internship, Industry Internship, Research/Development Internship), and
9. Multiple Exit and Multiple Entry
 - Certificate in Engineering after completion of first year.
 - Diploma in Engineering after completion of second year.
 - Advanced Diploma in Engineering after completion of third year.
 - Degree in Engineering after completion of fourth year
 - Degree in Engineering after completion of fourth year



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SCHEME - B. TECH – 2023-24 ONWARDS I SEM - CHEMISTRY CYCLE

SL	COURSE CODE	COURSE TITLE	SCHEME OF TEACHING					Duration in Hrs Exam	Examination (Maximum Marks)		
			L	T	P	J	C		CIE	SEE	TM
1	23EN1101	LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS	3	0	0	0	3	3	60	40	100
2	23EN1102	ENGINEERING CHEMISTRY	2	0	2	0	3	3	60	40	100
3	23EN1103	INTRODUCTION TO MECHANICAL ENGINEERING	2	0	2	0	3	3	60	40	100
4	23EN1104	INTRODUCTION TO ELECTRICAL ENGINEERING	2	0	0	0	2	3	60	40	100
5	23EN1105	C PROGRAMMING FOR PROBLEM SOLVING	2	1	2	0	4	3	60	40	100
6	23EN1106	ENGINEERING MECHANICS	2	0	0	0	2	3	60	40	100
7	23EN1107	TECHNICAL ENGLISH	2	0	0	0	2	1	100	-	100
8	23EN1108	ENVIRONMENTAL SCIENCE	1	0	0	0	1	1	50	-	50
9	23EN1109	KANNADA KALI / MANASU	1	0	0	0	0	1	50	-	50
TOTAL			17	1	6	0	20		560	240	800

Lecture, T – Tutorial, P – Practical, J – Project, C – No. of Credits, CIE – Continuous Internal Evaluation, SEE- Semester End Examinations, TM – Total Marks.



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SCHEME - B. TECH – 2023-24 ONWARDS I SEM - PHYSICS CYCLE

SL	COURSE CODE	COURSE TITLE	SCHEME OF TEACHING					Duration in Hrs Exam	Examination (Maximum Marks)		
			L	T	P	J	C		CIE	SEE	TM
1	23EN1101	LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS	3	0	0	0	3	3	60	40	100
2	23EN1110	ENGINEERING PHYSICS	3	0	2	0	4	3	60	40	100
3	23EN1111	INTRODUCTION TO ELECTRONICS ENGINEERING	3	0	0	0	3	3	60	40	100
4	23EN1112	C PROGRAMMING FOR PROBLEM SOLVING	2	1	2	0	4	3	60	40	100
5	23EN1113	ENGINEERING GRAPHICS AND DESIGN THINKING	2	0	2	0	3	3	60	40	100
6	23EN1114	BIOLOGY FOR ENGINEERS	2	0	0	0	2	1	100	-	100
7	23EN1115	CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS	1	0	0	0	1	1	50	-	50
TOTAL			16	1	6	0	20	17	450	200	650

Lecture, T – Tutorial, P – Practical, J – Project, C – No. of Credits, CIE – Continuous Internal Evaluation, SEE- Semester End Examinations, TM – Total Marks.



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SCHEME - B. TECH – 2023-24 ONWARDS II SEM - CHEMISTRY CYCLE

SL	COURSE CODE	COURSE TITLE	SCHEME OF TEACHING					Duration in Hrs Exam	Examination (Maximum Marks)		
			L	T	P	J	C		CIE	EE	TM
1	23EN1201	SINGLE AND MULTIVARIATE CALCULUS	3	0	0	0	3	3	60	40	100
2	23EN1202	OBJECT ORIENTED PROGRAMMING	2	1	2	0	4	3	60	40	100
3	23EN1102	ENGINEERING CHEMISTRY	2	0	2	0	3	3	60	40	100
4	23EN1103	INTRODUCTION TO MECHANICAL ENGINEERING	2	0	2	0	3	3	60	40	100
5	23EN1104	INTRODUCTION TO ELECTRICAL ENGINEERING	2	0	0	0	2	3	60	40	100
6	23EN1106	ENGINEERING MECHANICS	2	0	0	0	2	3	60	40	100
7	23EN1107	TECHNICAL ENGLISH	2	0	0	0	2	1	100	-	100
8	23EN1108	ENVIRONMENTAL SCIENCE	1	0	0	0	1	1	50	-	50
9	23EN1109	KANNADA KALI / MANASU	1	0	0	0	0	1	50	-	50
TOTAL			17	1	6	0	20		560	240	800

Lecture, T – Tutorial, P – Practical, J – Project, C – No. of Credits, CIE – Continuous Internal Evaluation, SEE- Semester End Examinations, TM – Total Marks.



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SCHEME - B. TECH – 2023-24 ONWARDS II SEM - PHYSICS CYCLE

SL	COURSE CODE	COURSE TITLE	SCHEME OF TEACHING					Contact Hours /Week	Examination (Maximum Marks)		
			L	T	P	J	C		CIE	SEE	TM
1	23EN1201	SINGLE AND MULTIVARIATE CALCULUS	3	0	0	0	3	3	60	40	100
2	23EN1202	OBJECT ORIENTED PROGRAMMING	2	1	2	0	4	3	60	40	100
3	23EN1110	ENGINEERING PHYSICS	3	0	2	0	4	3	60	40	100
4	23EN1111	INTRODUCTION TO ELECTRONICS ENGINEERING	3	0	0	0	3	3	60	40	100
5	23EN1113	ENGINEERING GRAPHICS AND DESIGN THINKING	2	0	2	0	3	3	60	40	100
6	23EN1114	BIOLOGY FOR ENGINEERS	2	0	0	0	2	01	100	-	100
7	23EN1115	CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS	1	0	0	0	1	01	50	-	
TOTAL			16	1	6	0	20	17	450	200	650

Lecture, T – Tutorial, P – Practical, J – Project, C – No. of Credits, CIE – Continuous Internal Evaluation, SEE- Semester End Examinations, TM – Total Marks.



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SCHEME - B. TECH – 2023-24 ONWARDS III SEM

SL	Course Type	Course Code	Course Name	Teaching Department	Teaching Hours / Week				Examination				Credits
					Lecture	Tutorial	Practical	Project	Duration in Hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	J					
1	BSC	23DS2301	Probability and Statistics	MAT	3	0	0	0	03	60	40	100	3
2	IPCC	23DS2302	Data Structures	CSE	3	0	2	0	05	60	40	100	4
3	IPCC	23DS2303	Digital Logic Design	ECE	3	0	2	0	05	60	40	100	4
4	PCC	23DS2304	Discrete Mathematics and Graph Theory	CSE	3	0	0	0	03	60	40	100	3
5	PCC	23DS2305	Web Technologies	DS	3	0	2	0	05	60	40	100	4
6	AEC	23LSXXXX	Liberal Studies/MOOC	All Dept.	1	0	0	0	01	50	--	50	1
7	SEC	23DS23XX	Skill Enhancement Course – I	DS	1	0	2	0	03	100	--	100	2
8	CTS	23DS2306	Cognitive & Technical Skills- I	CTS	2	0	0	0	03	100	--	100	2
Total					19	0	8	0	28	550	200	750	23



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Liberal Studies	
Course Code	Course Name
23LS0001	Introduction to Drama
23LS0002	Introduction to Dance
23LS0003	Introduction to Music
23LS0004	Introduction to Photography
23LS0005	Introduction to Japanese language
23LS0006	Law for Engineers
23LS0007	Introduction to Painting
23LS0008	Communication Through Sanskrit
23LS0009	Vedic Mathematics
23LS0010	Fundamentals of Critical Thinking
23LS0011	Introduction to Film Studies
23LS0012	Practicing Yoga & Meditation
23LS0013	Cyber Crimes, Policies & Laws
23LS0014	Introduction to German language

Sl. No	Course Code	Skill Enhancement Course – I
1	23DS2307	Programming in C++
2	23DS2308	OOPS with JAVA



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IV SEMESTER													
S.N	Course Type	Course Code	Course Name	Teaching Department	Teaching Hours / Week			Examination					Credits
					Lecture	Tutorial	Practical	Project	Duration in Hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	J					
1	BSC	23DS2401	Transforms and Numerical Techniques	MAT	3	0	0	0	03	60	40	100	3
2	IPCC	23DS2402	Design and Analysis of Algorithms	CSE	3	0	2	0	05	60	40	100	4
3	PCC	23DS2403	Database Management System	CSE	3	0	2	0	05	60	40	100	4
4	PCC	23DS2404	Statistical Foundations of Data Science	DS	3	0	2	0	05	60	40	100	4
5	IPCC	23DS2405	Computer Organization and Architecture	CSE	3	0	0	0	03	60	40	100	3
6	CTS	23DS2406	Cognitive & Technical Skills-II	CTS	2	0	0	0	03	100	--	100	2
7	SEC	23DS24XX	Skill Enhancement Course – II	DS	1	0	2	0	03	100	--	100	2
Total					18	0	8	0	27	500	200	700	22



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Sl. No	Course Code	Skill Enhancement Course – II
1	23DS2407	Data Analytics and Visualization Tools (ALTAIR)
2	23DS2408	MATLAB Programming



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V SEMESTER

V SEMESTER													
S.N	Course Type	Course Code	Course Name	Teaching Department	Teaching Hours / Week				Examination				Credits
					Lecture	Tutorial	Practical	Project	Duration in Hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	J					
1	IPCC / PCC	23DS3501	Enterprise Data Warehousing	DS	3	0	0	0	03	60	40	100	3
2	IPCC / PCC	23DS3502	Software Engineering Principles	DS	3	0	0	0	03	60	40	100	3
3	IPCC / PCC	23DS3503	Machine Learning	DS	3	0	2	0	05	60	40	100	4
4	IPCC / PCC	23DS3504	Big Data Analytics	DS	3	0	0	0	03	60	40	100	3
5	IPCC / PCC	23DS3505	Cloud Data Engineering	DS	3	0	2	0	05	100	--	100	4
6	PEC	23DS35XX	Professional Elective Course – I	DS	3	0	0	0	03	60	40	100	3
7	CTS	23DS3506	Cognitive & Technical Skills-III	DS	-	-	-	-	-	-	-	-	P/F
8	SEC	23DS35XX	Skill Enhancement Course- III	DS	0	0	0	2	02	100	--	100	2
Total					18	00	04	02	24	500	200	700	22



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Sl. No	Course Code	Skill Enhancement Course – III
1	23DS3507	BI Tools
2	23DS3508	MOOC



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Sl.N	VI SEMESTER												
	Course Type	Course Code	Course Name	Teaching Department	Teaching Hours / Week				Examination				Credits
					Lecture	Tutorial	Practical	Project	Duration in Hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	J					
1	IPCC / PCC	23DS3601	Computer Networks	DS	3	0	0	0	03	60	40	100	3
2	IPCC / PCC	23DS3602	Principles of DevOps & MLOps	DS	3	0	0	0	03	100	--	100	3
3	IPCC / PCC	23DS3603	Deep Learning essentials	DS	3	0	2	0	05	60	40	100	4
4	OEC	23OEXXX X	Open Elective – I	Any Dept.	3	0	0	0	03	60	40	100	3
5	PEC	23DS36X X	Professional Elective Course – II	DS	3	0	0	0	03	60	40	100	3
6	PEC	23DS36X X	Professional Elective Course – III	DS	3	0	0	0	03	60	40	100	3
7	CTS	23DS3604	Cognitive & Technical Skills-IV	DS	-	-	-	-	-	-	-	-	P/F
8	PROJ	23DS3605	Mini Project	DS	0	0	0	2	02	60	40	100	2
Total					18	0	02	2	22	460	240	700	21



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VII SEMESTER													
Sl. No	Course Type	Course Code	Course Name	Teaching Department	Teaching Hours / Week				Examination				Credits
					L	T	P	J	Duration in Hours	CIE Marks	SEE Marks	Total Marks	
1	HSMC	23DS4701	Entrepreneurial Finance & Deep Tech Start-ups	DS	2	0	0	0	02	100	-	100	2
2	PEC	23DS47XX	Professional Elective IV	DS	3	0	0	0	03	60	40	100	3
3	PEC	23DS47XX	Professional Elective V	DS	3	0	0	0	03	60	40	100	3
4	OE	23OEXXXX	Open Elective II	DS	3	0	0	0	03	60	40	100	3
5	PROJ	23DS4702	Capstone Project – Phase I	DS	0	0	0	8	-	60	40	100	4
Total					11	0	0	8	11	340	160	500	15

VIII SEMESTER													
S. No	Course Type	Course Code	Course Name	Teaching Department	Teaching Hours / Week				Examination				Credits
					L	T	P	J	Duration in Hours	CIE Marks	SEE Marks	Total Marks	
1	CORE		Leadership, Policy & Authentic Intelligence	DS	2	0	0	0	02	60	40	100	02
2	INT	23DS4802	Internship (Industry / Research / CoE based)		0	0	0	10	-	100	-	100	05
3	PROJ	23DS4801	Capstone Project Phase II		0	0	0	20	-	60	40	100	10
Total					2	0	0	30	02	220	80	300	17

I -20 II -20 III -23 IV – 22 V -22 VI -21 VII – 15 VIII – 17

NOTE: Total Credits (I-Sem to VIII Sem) = 160 credits.



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NOTE: Professional elective courses Domain-wise

SL. No.	Domain-wise	PROFESSIONAL ELECTIVE COURSES									
			PEC-I		PEC-II		PEC- III		PEC-IV		PEC-V
		5th Semester		6th Semester				7th Semester			
		Course Code	Course Name	Course Code	Course Name	Course Code	Course Name	Course Code	Course Name	Course Code	Course Name
Domain 1	Emergent AI Technologies		No SQL		Introduction to AI		Natural Language Techniques		Generative AI Systems with LLM		Multimodal RAG
Domain 2	Advanced Data Science		Mining of Massive Dataset		Massive Graph Analysis		Data-Driven Recommendations		Immersive Data Science		Streaming Analytics
Domain 3	Domain-Driven Analytics		Sensor Analytics		Vision Analytics		Bio-Informatics		Supply Chain Logistics		Risk Analytics for Finance
Domain 4	Core CSE		Theory of computation		Compiler Design & System software		Data Privacy and Cyber Security		Soft Computing Techniques		Responsible AI

OPEN ELECTIVE COURSES			
Open Elective -I		Open Elective-II	
Course Code	Course Name	Course Code	Course Name
23OE0014	Statistical Computing for Data Science	23OE0015	Data Exploration Using R