



DAYANANDA SAGAR  
UNIVERSITY

# Dayananda Sagar University School of Engineering

Devarakaggalahalli, Harohalli, Kanakapura Road, Ramanagara Dt., Bengaluru – 562 112

Department of  
Computer Science & Technology

B.Tech. PROGRAMME– 2022 BATCH

**SCHEME AND SYLLABUS**

(1<sup>th</sup> to 8<sup>th</sup> semester)

Academic Year 2024-25



## PART-B

# SCHEME AND SYLLABUS FOR B.TECH. CST (FIRST TO FOURTH YEARS) PROGRAMEE

### Definitions / Descriptions

Definition of Credit:	
1 Hour Lecture (L) Per Week	01 Credit
1 Hour Tutorial (T) Per Week	0.5 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





SCHEME - B.TECH - 2022-23 ONWARDS  
I SEM - CHEMISTRY CYCLE

SL	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR / AU	SCHEME OF TEACHING					PREREQUISITE	
					L	T	P	S/P	C	SEM	COURSE CODE
1	101-105 & 121-123	22EN1101	LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS	CR	3	-	-	-	3	*	...
2	101-105 & 121-123	22EN1102	C PROGRAMMING FOR PROBLEM SOLVING	CR	2	-	2	-	3	*	...
3	101-105 & 121-123	22EN1103	ENGINEERING CHEMISTRY	CR	3	-	2	-	4	*	...
4	101-105 & 121-123	22EN1104	ELEMENTS OF MECHANICAL ENGINEERING	CR	2	-	2	-	3	*	...
5	101-105 & 121-123	22EN1105	INTRODUCTION TO ELECTRICAL ENGINEERING	CR	3	-	-	-	3	*	...
6	101-105 & 121-123	22EN1106	BIOLOGY FOR ENGINEERS	CR	3	-	-	-	3	*	...
7	101-105 & 121-123	22EN1107	CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS	CR	1	-	-	-	1	*	...
8	101-105 & 121-123	22EN1108	KANNADA KALI / MANASU	CR	1	-	-	-	1	*	...
					18	-	06	-	21		

CR - Credit, AU - Audit, L - Lecture, T - Tutorial, P - Practical, S/P - Seminar/Project, C - No. of Credits





SCHEME - B.TECH - 2022-23 ONWARDS  
I SEM - PHYSICS CYCLE

SL	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR / AU	SCHEME OF TEACHING					PREREQUISITE	
					L	T	P	S/P	C	SEM	COURSE CODE
1	101-105 & 121-123	22EN1101	LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS	CR	3	-	-	-	3	*	...
2	101-105 & 121-123	22EN1102	C PROGRAMMING FOR PROBLEM SOLVING	CR	2	-	2	-	3	*	...
3	101-105 & 121-123	22EN1109	ENGINEERING PHYSICS	CR	3	-	2	-	4	*	...
4	101-105 & 121-123	22EN1110	ENGINEERING MECHANICS	CR	3	-	-	-	3	*	...
5	101-105 & 121-123	22EN1111	INTRODUCTION TO ELECTRONICS	CR	3	-	-	-	3	*	...
6	101-105 & 121-123	22EN1112	ENGINEERING GRAPHICS AND DESIGN THINKING	CR	2	-	2	-	3	*	...
7	101-105 & 121-123	22EN1113	ENVIRONMENTAL SCIENCE	CR	1	-	-	-	1	*	...
8	101-105 & 121-123	22EN1114	TECHNICAL ENGLISH	CR	1	-	-	-	1	*	...
					18	-	06	-	21		

CR - Credit, AU - Audit, L - Lecture, T - Tutorial, P - Practical, S/P - Seminar/Project, C - No. of Credits





SCHEME - B.TECH - 2022-23 ONWARDS  
II SEM - CHEMISTRY CYCLE

SL	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR / AU	SCHEME OF TEACHING					PREREQUISITE	
					L	T	P	S/P	C	SEM	COURSE CODE
1	101-105 & 121-123	22EN1201	SINGLE AND MULTIVARIATE CALCULUS	CR	3	-	-	-	3	*	...
2	101-105 & 121-123	22EN1202	PYTHON PROGRAMMING FOR PROBLEM SOLVING	CR	2	-	2	-	3	*	...
3	101-105 & 121-123	22EN1103	ENGINEERING CHEMISTRY	CR	3	-	2	-	4	*	...
4	101-105 & 121-123	22EN1104	ELEMENTS OF MECHANICAL ENGINEERING	CR	2	-	2	-	3	*	...
5	101-105 & 121-123	22EN1105	INTRODUCTION TO ELECTRICAL ENGINEERING	CR	3	-	-	-	3	*	...
6	101-105 & 121-123	22EN1106	BIOLOGY FOR ENGINEERS	CR	3	-	-	-	3	*	...
7	101-105 & 121-123	22EN1107	CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS	CR	1	-	-	-	1	*	...
8	101-105 & 121-123	22EN1108	KANNADA KALI / MANASU	CR	1	-	-	-	1	*	...
					18	-	06	-	21		

CR – Credit, AU – Audit, L – Lecture, T – Tutorial, P – Practical, S/P – Seminar/Project, C – No. of Credits





SCHEME - B.TECH - 2022-23 ONWARDS  
II SEM - PHYSICS CYCLE

SL	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR / AU	SCHEME OF TEACHING					PREREQUISITE	
					L	T	P	S/P	C	SEM	COURSE CODE
1	101-105 & 121-123	22EN1201	SINGLE AND MULTIVARIATE CALCULUS	CR	3	-	-	-	3	*	...
2	101-105 & 121-123	22EN1202	PYTHON PROGRAMMING FOR PROBLEM SOLVING	CR	2	-	2	-	3	*	...
3	101-105 & 121-123	22EN1109	ENGINEERING PHYSICS	CR	3	-	2	-	4	*	...
4	101-105 & 121-123	22EN1110	ENGINEERING MECHANICS	CR	3	-	-	-	3	*	...
5	101-105 & 121-123	22EN1111	INTRODUCTION TO ELECTRONICS	CR	3	-	-	-	3	*	...
6	101-105 & 121-123	22EN1112	ENGINEERING GRAPHICS AND DESIGN THINKING	CR	2	-	2	-	3	*	...
7	101-105 & 121-123	22EN1113	ENVIRONMENTAL SCIENCE	CR	1	-	-	-	1	*	...
8	101-105 & 121-123	22EN1114	TECHNICAL ENGLISH	CR	1	-	-	-	1	*	...
					18	-	06	-	21		

CR – Credit, AU – Audit, L – Lecture, T – Tutorial, P – Practical, S/P – Seminar/Project, C – No. of Credits





III 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	22CT2301	Transforms and Numerical Techniques	MAT	3	0	0	0	03	60	40	100	3
2	IPCC	22CT2302	Data Structures	CSE	3	0	2	0	03	60	40	100	4
3	IPCC	22CT2303	Digital Logic Design	ECE	3	0	2	0	03	60	40	100	4
4	PCC	22CT2304	Discrete Mathematics and Graph Theory	CSE	3	0	0	0	03	60	40	100	3
5	PCC	22CT2305	Full Stack Development	CST	3	0	0	0	03	60	40	100	3
6	AEC	22LSXXXX	Liberal Studies - I	Any Dept.	1	0	0	0	01	50	--	50	1
7	SEC	22CT23XX	Skill Enhancement Course - I	Resp. Dept.	1	0	2	0	01	100	--	100	2
<b>Total</b>					<b>17</b>	<b>00</b>	<b>06</b>	<b>00</b>	<b>17</b>	<b>450</b>	<b>200</b>	<b>650</b>	<b>20</b>





Liberal Studies - I			
S.N	Course Code	Course Name	Offering department
1	22LS0001	Introduction to Drama	Any department
2	22LS0002	Introduction to Dance	
3	22LS0003	Introduction to Music	
4	22LS0004	Introduction to Photography	
5	22LS0005	Introduction to Japanese Language	
6	22LS0006	Law for Engineers	
7	22LS0007	Introduction to Painting	
8	22LS0008	Communication Through Sanskrit	
9	22LS0009	Vedic Mathematics	
10	22LS0010	Fundamentals of Critical Thinking	
11	22LS0011	Introduction to Film Studies	
12	22LS0012	Practicing Yoga & Meditation	
13	22LS0013	Cyber Crimes, Policies & Laws	
14	22LS0014	Holistic Medicine	
15	22LS0015	3 D Modelling using Tinkercad	

Skill Enhancement Course - I		
S.N	Course Code	Course Name
1	22CT2306	Design Thinking & Ideation
2	22CT2307	Innovative Businesses & Breakthrough Technologies





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	22CT2401	Probability & Statistics	MAT	3	0	0	0	03	60	40	100	3
2	IPCC	22CT2402	Design and Analysis of Algorithms	CSE	3	0	2	0	03	60	40	100	4
3	PCC	22CT2403	Database Management System	CSE	3	0	2	0	03	60	40	100	4
4	PCC	22CT2404	Product Design & Development	CST	2	0	2	2	02	60	40	100	4
5	IPCC	22CT2405	Computer Organization and Architecture	CSE	3	0	0	0	03	60	40	100	3
6	PCC	22CT24XX	Special Topic	CST	1	0	0	2	--	100		100	2
7	SEC	22CT24XX	Skill Enhancement Course - II	CST	1	0	2	0	--	100	--	100	2
<b>Total</b>					<b>16</b>	<b>00</b>	<b>08</b>	<b>04</b>	<b>14</b>	<b>500</b>	<b>200</b>	<b>700</b>	<b>22</b>





Special Topic		
S.N	Course Code	Course Name
1	22CT2406	Introduction to IPR & Registration
2	22CT2407	Research Paper Writing

Skill Enhancement Course - II		
S.N	Course Code	Course Name
1	22CT2408	Small E-Business Launch
2	22CT2409	Idea Generation and Validation





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	22CT3501	Theory of Computation	CSE	3	1	0	0	03	60	40	100	4
2	PCC	22CT3502	Software Engineering & Project Management	CSE	3	0	0	0	03	60	40	100	3
3	IPCC	22CT3503	Artificial Intelligence & Machine Learning	CSE	3	0	2	0	03	60	40	100	4
4	IPCC	22CT3504	Lean Startup Methodology	CST	2	0	0	2	03	60	40	100	3
5	IPCC	22CT3505	Operating System	CSE	3	0	2	0	03	60	40	100	4
6	PEC	22CT35XX	Professional Elective Course - I / MOOC	CST	3	0	0	0	03	60	40	100	3
7	SEC	22CT35XX	Skill Enhancement Course - III	CST	1	0	2	0	01	100	--	100	2
8	SEC	22CT3506	Cognitive and Technical Skills- I	CST	0	0	4	0	04	100	--	100	2
<b>Total</b>					<b>18</b>	<b>01</b>	<b>10</b>	<b>02</b>	<b>21</b>	<b>560</b>	<b>240</b>	<b>800</b>	<b>25</b>





Professional Elective Course - I		
S.N	Course Code	Course Name
1	22CT3507	Interactive Art and Creative Coding
2	22CT3508	Quantum Computing Fundamentals
3	22CT3509	IoT Fundamentals: Architecture to Analytics
4	22CT3510	NoSQL Database Fundamentals

Skill Enhancement Course - III		
S.N	Course Code	Course Name
1	22CT3511	DevSecOps Fundamentals and Best Practices
2	22CT3512	R for Data Analysis and Application Development
3	22CT3513	Introduction to Product Marketing
4	22CT3514	AWS Web Services





**VI 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	HSM C	22CT3601	Supply Chain Management & Logistics	CST	2	0	0	0	02	60	40	100	2
2	PCC	22CT3602	Introduction to Computer Networks	CST	3	0	2	0	03	60	40	100	4
3	PCC	22CT3603	Product Analytics	CST	2	0	0	2	03	60	40	100	3
4	OEC	22OEXXXX	Open Elective - I	All Dept.	3	0	0	0	03	60	40	100	3
5	PEC	22CT36XX	Professional Elective Course - II / MOOC	CST	3	0	0	0	03	60	40	100	3
6	PEC	22CT36XX	Professional Elective Course - III / MOOC	CST	3	0	0	0	03	60	40	100	3
7	SEC	22CT3604	Cognitive and Technical Skills- II	CST	0	0	4	0	04	100	--	100	2
8	PROJ	22CT3605	Minor Project	CST	0	0	0	4	01	100	--	100	2
<b>Total</b>					<b>16</b>	<b>00</b>	<b>06</b>	<b>06</b>	<b>20</b>	<b>560</b>	<b>240</b>	<b>800</b>	<b>22</b>

**Internship:** All the students admitted to III year shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A university examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not takeup/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements





Open Electives-I		
S.N	Course Code	Course Name
1	22OE0034	Small E-Business Launch
2	22OE0021	Product Engineering & Entrepreneurship

Professional Elective Course - II		
S.N	Course Code	Course Name
1	22CT3606	Gaming Design Fundamentals
2	22CT3607	Fundamentals of Quantum Cryptography/ Quantum Algorithms and Cryptography
3	22CT3608	Edge Computing with IoT
4	22CT3609	Data Engineering / Data Science for Engineers

Professional Elective Course - III		
S.N	Course Code	Course Name
1	22CT3610	Game Development using Unity/ Game Development Using Godot
2	22CT3611	Qiskit and Quantum Circuits: A Hands-On Approach
3	22CT3612	Building Intelligent IoT Systems/ Foundations of Cloud IoT Edge ML
4	22CT3613	Effective Data Transformation with DBT





VII 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	PEC	22CT4701	Technology Strategy	CST	2	0	0	2	03	60	40	100	3
3	OEC	22OEXXXX	Open Elective - II	All Dept.	3	0	0	0	03	60	40	100	3
4	PEC	22CT47XX	Professional Elective Course - IV/ MOOC	CST	3	0	0	0	03	60	40	100	3
5	PEC	22CT47XX	Professional Elective Course - V / MOOC	CST	3	0	0	0	03	60	40	100	3
6	PROJ	22CT4702	Capstone Project-Phase I	CST	0	0	0	6	03	100	--	100	3
<b>Total</b>					<b>11</b>	<b>00</b>	<b>00</b>	<b>08</b>	<b>15</b>	<b>340</b>	<b>160</b>	<b>500</b>	<b>15</b>





**Open Electives-II**

<u>S.N</u>	<u>Course Code</u>	<u>Course Name</u>
1	22OE0033	Lean Startup Methodology
2	22OE0048	Product Analytics

**Professional Elective Course - IV**

<u>S.N</u>	<u>Course Code</u>	<u>Course Name</u>
1	22CT4703	AR/VR & Game-Theoretic/ Algorithmic Game Theory
2	22CT4704	Quantum Artificial Intelligence
3	22CT4705	Cyber-physical systems /Foundations of Cyber-physical Systems
4	22CT4706	Introduction to Data Visualization

**Professional Elective Course - V**

<u>S.N</u>	<u>Course Code</u>	<u>Course Name</u>
1	22CT4707	Unreal Engine Game Development for Beginners
2	22CT4708	Quantum Computing with PennyLane/ Quantum Machine learning with TensorFlow Quantum
3	22CT4709	Real-Time Cyber-Physical Systems Design using MATLAB
4	22CT4710	Tableau for Data Analysts/ Power BI for Data Analysts





**VIII 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	PROJ	22CT4801	Capstone Project- Phase II	CST	0	0	0	22	03	60	40	100	11
2	INT	22CT4802	Internship	CST	0	0	6	0	03	100	--	100	03
<b>Total</b>					<b>00</b>	<b>00</b>	<b>06</b>	<b>22</b>	<b>06</b>	<b>160</b>	<b>40</b>	<b>200</b>	<b>14</b>

**NOTE 1: Internship**

Completed during the intervening vacations of VI and VII semesters and /or VII and VIII semesters or VIII semester

**NOTE 2: Total Credits (I-Sem to VIII Sem) = 160 credits.**

- I -21
- II -21
- III -20
- IV -22
- V -25
- VI -22
- VII -15
- VIII -14
- Total=160**





**Elective courses domain-wise**

S. N		PROFESSIONAL ELECTIVE COURSES					
		PEC-I	PEC-II	PEC-III	PEC-IV	PEC-V	
Domain-wise		5 <sup>th</sup> Semester		7 <sup>th</sup> Semester			
Domain Clusters		Course Name	Course Name	Course Name	Course Name	Course Name	
1	Domain-1	GAMING AND ANIMATIONS/A R&VR	Interactive Art and Creative Coding	Gaming Design Fundamentals	Game Development using Unity/ Game Development Using Godot	AR/VR & Game-Theoretic/ Algorithmic Game Theory	Unreal Engine Game Development for Beginners
2	Domain-2	QUANTUM INFORMATION SYSTEM	Quantum Computing Fundamentals	Fundamentals of Quantum Cryptography/ Quantum Algorithms and Cryptography	Qiskit and Quantum Circuits: A Hands-On Approach	Quantum Artificial Intelligence	Quantum Computing with PennyLane/ Quantum Machine learning with TensorFlow Quantum
3	Domain-3	INTERNET OF THINGS TOOLS & TECHNOLOGIES	IoT Fundamentals: Architecture to Analytics	Edge Computing with IoT	Building Intelligent IoT Systems/ Foundations of Cloud IoT Edge ML	Cyber-physical systems /Foundations of Cyber-physical systems	Real-Time Cyber-Physical Systems Design using MATLAB
4	Domain-4	DATA ANALYTICS	NoSQL Database Fundamentals	Data Engineering / Data Science for Engineers	Effective Data Transformation with DBT	Introduction to Data Visualization	Tableau for Data Analysts/ Power BI for Data Analysts

