

Course Structure

B.Tech. (Computer Science and Design Engineering)

Batch-2025

B.Tech. (Computer Science and Design Engineering) 2025

1st Semester						
Course Category	Course Name	Course Code	L	T	P	Credit
EP	Engineering Visualization	ME121	0	1	3	5
EP	Computer Science Engineering Practices	CS102	1	0	2	5
IE	Computer Programming	CS101	3	1	0	11
IE	Computer Programming Laboratory	CS101L	0	0	2	2
IS	Biology	BY101	2	1	0	8
IS	Classical Physics	PY111	3	1	0	11
IS	Inorganic and Physical Chemistry	CY111	3	1	0	11
IS	Real Analysis & Calculus	MA111	3	1	0	11
IS	Chemistry Laboratory	CY111L	0	0	2/2	1
IS	Physics Laboratory	PY111L	0	0	2/2	1
		Total Credits				66
LM	Basic English*	LM101	1	2	0	7

*It is not a compulsory course

2nd Semester						
Course Category	Course Name	Course Code	L	T	P	Credit
EP	Workshop Practices	ME131	0	0	3	3
IE	Engineering Thermodynamics	CH161	3	1	0	11
IE	Fundamentals of Electronics Engineering	ECE102	3	1	0	11
IE	Fundamentals of Electronics Engineering Laboratory	ECE102L	0	0	2	2
IE	Programming with Python & MATLAB	CS111	1	0	2	5
IS	Differential Equations	MA121	3	1	0	11
IS	Modern Physics	PY121	2	1	0	8
IS	Physics Laboratory	PY121L	0	0	2/2	1
		Total Credits				52
HU	Community Internship	HU102	0	0	5	5

Summer Internship						
Course Category	Course Name	Course Code	L	T	P	Credit
DP	Summer Internship/Industrial Visit (I)	DP	0	0	14*	2
*2 credits are equivalent to 14 hours per week if summer internship/project will be completed in 2 weeks only.						

3rd Semester						
Course Category	Course Name	Course Code	L	T	P	Credit
DC	Aerial Robotic Designing	CS241	3	0	0	9
DC	Aerial Robotic Designing Laboratory	CS241L	0	0	2	2
IE	Data Structure and Algorithm	CS211	3	0	0	9
IE	Data Structure and Algorithm Laboratory	CS211L	0	0	2	2
DC	Discrete Mathematics	MA213	3	0	0	9
DC	Graphics and Visual Computing	CS231	3	0	0	9
DC	Graphics and Visual Computing Laboratory	CS231L	0	0	2	2
IS	Linear Algebra & Complex Analysis	MA211	2	1	0	8
LM	Professional Communications	PC101	2	1	0	8
		Total Credits				58

4th Semester						
Course Category	Course Name	Course Code	L	T	P	Credit
DC	Algorithm	CS242	3	0	0	9
DC	Algorithm Laboratory	CS242L	0	0	2	2
DC	Computer Game Design and Programming	CS233	3	0	0	9
DC	Computer Game Design and Programming Laboratory	CS233L	0	0	2	2
DC	Database Management System	CS212	3	0	0	9
DC	Database Management System Laboratory	CS212L	0	0	2	2
DC	Operations Research	MA325	3	0	0	9
DC	Operations Research Laboratory	CS484L	0	0	2	2
DC	Introduction to Machine Learning	MA351	2	0	0	6
DC	Introduction to Machine Learning Laboratory	MA351L	0	0	2	2
IS	Numerical Methods	MA221	2	1	0	8
IS	Statistical Methods & Data Analysis	MA231	2	1	0	8
		Total Credits				68

Summer Internship						
Course Category	Course Name	Course Code	L	T	P	Credit
DP	Summer Internship/Industrial Visit (II)	DP	0	0	11*	3
*3 credits are equivalent to 10.5 hours (around 11 hours) (P) per week if summer internship/project will be completed in 4 weeks only.						

5th Semester						
Course Category	Course Name	Course Code	L	T	P	Credit
DC	Digital Twin Design	CS411	3	0	0	9
DC	Operating Systems	CS311	3	0	0	9
DC	Operating Systems Laboratory	CS311L	0	0	2	2
DC	Theory of Computation	CS321	3	0	0	9
DC	UX/UI Design	CS352	2	0	0	6
DC	UX/UI Design Laboratory	CS352L	0	0	2	2
DE-1	Multimedia Technologies (Video/Audio Engg.)	CS332	3	0	0	9
	Multimedia Technologies (Video/Audio Engg.) Laboratory	CS332L	0	0	2	2
DE-2	AI/ML/DL Applications	CS365	3	0	0	9
	AI/ML/DL Applications Laboratory	CS365L	0	0	2	2
DE-3	Natural Language Processing	CS566	3	0	2	11
	Information Retrieval	CS567				
		Total Credits				70

6th Semester						
Course Category	Course Name	Course Code	L	T	P	Credit
DC	AR/VR	CS481	2	0	0	6
DC	AR/VR Laboratory	CS481L	0	0	2	2
DC	Computer Networks	CS351	3	0	0	9
DC	Computer Networks Laboratory	CS351L	0	0	2	2
DC	Devops & Cloud	CS333	3	0	0	9
DC	Robotics Design & IoT	CS346	3	0	0	9
DC	Web Technology	CS222	3	0	0	9
DC	Web Technology Laboratory	CS222L	0	0	2	2
DC	Generative AI	CS441	2	0	0	6
DC	Generative AI Laboratory	CS441L	0	0	2	2
Total Credits						56

Summer Internship						
Course Category	Course Name	Course Code	L	T	P	Credit
DP	Summer Internship/Industrial Visit (III)	DP	0	0	12*	5
*5 credits are equivalent to 11.67 hours (around 12 hours) (P) per week if summer internship/project will be completed in 6 weeks only.						

7th Semester						
Course Category	Course Name	Course Code	L	T	P	Credit
DE-4	Computer Vision and Pattern Recognition	CS454	3	0	0	9
EP	CDC: Employability Skill and Industry Readiness		0	0	2	2
HSS-1	Organizational Psychology	HU331	2	0	0	6
HSS-2	Sociology of Industry and Work Culture	HU313	2	0	0	6
HSS-3	CDC: Ethics and Corporate Governance		2	0	0	6
LM-1	Principles of Economics	MT5100	2	0	0	6
	CDC Leadership and People Management					
LM-2	Foundations of Management	MT5405	2	0	0	6
OE-1			3	0	0	9
OE-2			3	0	0	9
		Total Credits				59

8th Semester						
Course Category	Course Name	Course Code	L	T	P	Credit
DP	Internship/BTP		0	0	40	40
		Total Credits				40

Course Summary				
Category Code	Course Category	Min	Max	Offered
HU	Humanities and Social Science	22	22	23
IS	Institute Science	70	90	87
IE	Institute Engineering	40	70	53
EP	Engineering Practices	18	24	15
LM	Language & Management	18	24	20
DC	Departmental Core	145	190	176
DE	Departmental Elective	30	75	42
OE	Open Elective	15	20	18
DP	Project/Industrial Visit	20	50	50
Total		440	490	484

HU Courses						
Course Name	Course Code	L	T	P	Credit	
Organizational Psychology (HSS-1)	HU331	2	0	0	6	
Sociology of Industry and Work Culture (HSS-2)	HU313	2	0	0	6	
CDC: Ethics and Corporate Governance (HSS-3)		2	0	0	6	
Community Internship	HU102	0	0	5	5	
Total Credits					23	

Institute Science Course (IS)						
Course Name	Course Code	L	T	P	Credit	
Biology	BY101	2	1	0	8	
Classical Physics	PY111	3	1	0	11	
Inorganic and Physical Chemistry	CY111	3	1	0	11	
Real Analysis & Calculus	MA111	3	1	0	11	
Chemistry Laboratory	CY111L	0	0	2/2	1	
Physics Laboratory	PY111L	0	0	2/2	1	
Differential Equations	MA121	3	1	0	11	
Modern Physics	PY121	2	1	0	8	
Physics Laboratory	PY121L	0	0	2/2	1	

Linear Algebra & Complex Analysis	MA211	2	1	0	8
Numerical Methods	MA221	2	1	0	8
Statistical Methods & Data Analysis	MA231	2	1	0	8
	Total Credits				87

Institute Engineering Course (IE)						
Course Name	Course Code	L	T	P	Credit	
Computer Programming	CS101	3	1	0	11	
Computer Programming Laboratory	CS101L	0	0	2	2	
Engineering Thermodynamics	CH161	3	1	0	11	
Fundamentals of Electronics Engineering	ECE102	3	1	0	11	
Fundamentals of Electronics Engineering Laboratory	ECE102L	0	0	2	2	
Programming with Python & MATLAB	CS111	1	0	2	5	
Data Structure and Algorithm	CS211	3	0	0	9	
Data Structure and Algorithm Laboratory	CS211L	0	0	2	2	
	Total Credits				53	

EP Courses						
Course Name	Course Code	L	T	P	Credit	
CDC: Employability Skill and Industry Readiness		0	0	2	2	
Computer Science Engineering Practices	CS102	1	0	2	5	
Engineering Visualization	ME121	0	1	3	5	
Workshop Practices	ME131	0	0	3	3	
	Total Credits				15	

LM Courses						
Course Name	Course Code	L	T	P	Credit	
Principles of Economics (LM-1)	MT5100	2	0	0	6	
CDC Leadership and People Management (LM-2)						
Foundations of Management (LM-2)	MT5405	2	0	0	6	
Professional Communications	PC101	2	1	0	8	
	Total Credits				20	

Department Core Courses (DC)						
Course Name	Course Code	L	T	P	Credit	
Aerial Robotic Designing	CS241	3	0	0	9	
Aerial Robotic Designing Laboratory	CS241L	0	0	2	2	
Discrete Mathematics	MA213	3	0	0	9	
Graphics and Visual Computing	CS231	3	0	0	9	
Graphics and Visual Computing Laboratory	CS231L	0	0	2	2	
Algorithm	CS242	3	0	0	9	
Algorithm Laboratory	CS242L	0	0	2	2	
Computer Game Design and Programming	CS233	3	0	0	9	
Computer Game Design and Programming Laboratory	CS233L	0	0	2	2	
Database Management System	CS212	3	0	0	9	
Database Management System Laboratory	CS212L	0	0	2	2	
Introduction to Machine Learning	MA351	2	0	0	6	
Introduction to Machine Learning Laboratory	MA351L	0	0	2	2	
Operations Research	MA325	3	0	0	9	
Operations Research Laboratory	CS484L	0	0	2	2	
Digital Twin Design	CS411	3	0	0	9	
Operating Systems	CS311	3	0	0	9	
Operating Systems Laboratory	CS311L	0	0	2	2	
Theory of Computation	CS321	3	0	0	9	
UX/UI Design	CS352	2	0	0	6	
UX/UI Design Laboratory	CS352L	0	0	2	2	
AR/VR	CS481	2	0	0	6	
AR/VR Laboratory	CS481L	0	0	2	2	
Computer Networks	CS351	3	0	0	9	
Computer Networks Laboratory	CS351L	0	0	2	2	
Devops & Cloud	CS333	3	0	0	9	
Robotics Design & IoT	CS346	3	0	0	9	
Web Technology	CS222	3	0	0	9	
Web Technology Laboratory	CS222L	0	0	2	2	
Generative AI	CS441	2	0	0	6	
Generative AI Laboratory	CS441L	0	0	2	2	
Total Credits					176	

Department Elective Courses (DE)						
Course Name	Course Code	L	T	P	Credit	
Multimedia Technologies (Video/Audio Engg.) (DE-1)	CS332	3	0	0	9	
Multimedia Technologies (Video/Audio Engg.) Laboratory (DE-1)	CS332L	0	0	2	2	
AI/ML/DL Applications (DE-2)	CS365	3	0	0	9	
AI/ML/DL Applications Laboratory (DE-2)	CS365L	0	0	2	2	
Natural Language Processing (DE-3)	CS566	3	0	2	11	
Information Retrieval (DE-3)	CS567					
Computer Vision and Pattern Recognition (DE-4)	CS454	3	0	0	9	
Total Credits					42	

OE Courses					
Course Name	Course Code	L	T	P	Credit
OE-1		3	0	0	9
OE-2		3	0	0	9
Total Credits					18

Project/Industry Visit (DP)					
Course Name	Course Code	L	T	P	Credit
Summer Internship/Industrial Visit (I)		0	0	14***	2
Summer Internship/Industrial Visit (II)		0	0	11**	3
Summer Internship/Industrial Visit (III)		0	0	12*	5
Internship/BTP		0	0	40	40
Total Credits					50

*5 credits are equivalent to 11.67 hours (around 12 hours) (P) per week if summer internship/project will be completed in 6 weeks only.

**3 credits are equivalent to 10.5 hours (around 11 hours) (P) per week if summer internship/project will be completed in 4 weeks only.

***2 credits are equivalent to 14 hours per week if summer internship/project will be completed in 2 weeks only.