

COURSE STRUCTURE
for
B.Tech Degree
in
Computer Science and Engineering

Streams in Computer Science and Engineering

1. Artificial Intelligence
2. High Performance Computing
3. IoT and Cloud Computing

	Artificial Intelligence	High Performance Computing	IoT and Cloud Computing
DE1	Artificial Intelligence CS360	Cloud Computing CS374 or Artificial Intelligence CS360	Cloud Computing CS374 or Artificial Intelligence CS360
DE2	Deep Learning CS365 or GeneticCS361 Algorithm	Parallel Computing CS371 or Advanced Computer Architecture and Parallel Processing CS372	Internet of Things (IoT) CS346
DE3	Data Analytics CS457	Data AnalyticsCS457	Cryptography CS 430 or Data Analytics CS457 or Cloud Computing CS374
DE4	Computer Vision and Pattern Recognition CS454	Distributed Computing CS472	Cyber Security CS431 or Cryptology CS432
DE 5 -7	Deep Learning CS465/Natural Language Processing CS466 /Genetic Algorithm CS461/Image, Speech, Video Processing CS455 /Robotics CS467/AI Applications CS561/Combinatorics CS402	Deep LearningCS465/Natural Language ProcessingCS466 /Formal Language and Automata Theory CS422/Combinatorics CS402/Quantum Computing CS501	Deep Learning CS465/Natural Language Processing CS466 /Formal Language and Automata TheoryCS422/Information Retrieval CS511/Information coding Theory CS512/Blockchain Technology CS513/Data Compression CS514

Institute Science Courses

Classical Physics (IS)	3	1	0	11
Inorganic and Physical Chemistry (IS)	3	1	0	11
Real Analysis & Calculus (IS)	3	1	0	11
Biology (IS)	2	1	0	8
Modern Physics (IS)	2	1	0	8
Differential Equations (IS)	3	1	0	11
Physics lab (IS)	0	0	2/2	1
Chemistry lab (IS)	0	0	2/2	1
Linear Algebra & Complex Analysis (IS)	2	1	0	8
Numerical Methods (IS)	2	1	0	8
Statistical Methods and Data Analysis (IS)	2	1	0	8
Total				86

Institute Engineering Courses

Course	L	T	P	Credit
Computer Programming (CS 101)	3	1	2	13
Fundamentals of Electronics Engineering	3	1	2	13
Web Technology CS222	3	1	2	13
Material Science	3	1	0	11
Engineering Thermodynamics	3	1	0	11
Total Credit				61

EP, LM and HU Courses

	Course	L	T	P	Credit
EP	Engineering Graphics	0	0	3	3
	Workshop	0	0	3	3
	Computer Engineering Practices (CS102)	1	0	2	5
	Total Credit				11
LM	L/M-1	3	0	0	9
	L/M-2	3	0	0	9
	Total Credit				18
HU	Universal Human Values	1	1	0	5
	Community Internship	1	1	0	5
	Humanities	3	0	0	9
	Total Credit				19

Department Core courses

Discrete Mathematics (DC) CS201	3	0	0	9
Data Structure and Algorithm(DC) CS211	3	0	2	11
Programming with Python (DC) CS221	1	0	2	5
Graphics and Visual Computing (DC) CS231	2	0	2	8
Database Management Systems (DC) CS212	3	0	2	11
Computer Organization and Architecture (DC) CS231	3	0	0	9
Digital Circuit and Systems (DC) ECE231	3	1	2	13
Operating Systems (DC) CS311	3	0	2	11
Microprocessor Engineering (DC)	3	0	2	11
Theory of Computation (DC) CS321	3	0	0	9
Software Engineering (DC) CS331	3	0	0	9

Design and Analysis of Algorithms (DC) CS341	3	0	0	9
Computer Networks (DC) CS351	3	0	2	11
Compiler Design (DC) CS312	3	0	2	11
Operations Research (DC) CS391	3	0	0	9
Mobile Computing (DC) CS411	3	0	0	9
Soft Computing (DC) CS468	2	0	2	8
Digital Image Processing (DC) CS431	2	0	2	8
Data Mining (DC) CS458	2	0	2	8
Total				179

Department Elective courses

Course	L	T	P	Credit
Artificial Intelligence (CS360)	3	0	0	9
Soft Computing (CS468)	3	0	0	9
Data Analytics (CS457)	3	0	0	9
Computer Vision and Pattern Recognition (CS454)	3	0	0	9
Machine Learning (CS464)	3	0	0	9
Parallel Computing (CS371)	3	0	0	9
Distributed Computing (CS472)	3	0	0	9
Internet of Things (IoT)(CS346)	3	0	0	9
Cloud Computing (CS374)	3	0	0	9
Cyber Security(CS431)	3	0	0	9
Geographic Information System (CS363)	3	0	0	9
Digital Image Processing (CS431)	3	0	0	9
Geoinformatics (CS365)	3	0	0	9
Total Credit (for 4 selected)				36

Other Departmental Elective Courses

Course	L	T	P	Credit
Deep Learning (CS465)	3	0	0	9
Combinatorics (CS402)	3	0	0	9
Natural Language Processing (CS466)	3	0	0	9
Image, Speech, Video Processing (CS455)	3	0	0	9
Robotics (CS467)	3	0	0	9
Information Retrieval (CS511)	3	0	0	9
Information Theory (CS512)	3	0	0	9
Formal Language and Automata Theory (CS422)	3	0	0	9
AI Applications (CS561)	3	0	0	9
Total Credit (for 4 selected)				36

Other Departmental Elective Courses

Course	L	T	P	Credit
Genetic Algorithm (CS361)	3	0	0	9
Computer Vision and Pattern Recognition (CS454)	3	0	0	9
Image, Speech, Video Processing (CS455)	3	0	0	9
Advanced Com. Architecture & Parallel Processing (CS372)	3	0	0	9
Distributed Computing (CS472)	3	0	0	9
Information Retrieval (CS511)	3	0	0	9
Information Coding Theory (CS512)	3	0	0	9
Cryptography (CS430)	3	0	0	9
Cyber Security (CS431)	3	0	0	9
Cryptology (CS432)	3	0	0	9
AI Applications (CS561)	3	0	0	9
Blockchain Technology (CS513)	3	0	0	9
Data Compression (CS514)	3	0	0	9
Total Credit (for 4 selected)				36

Other Departmental PG Courses

Course	L	T	P	Credit
Modern Cryptology (CS537)	3	0	0	9
Machine Learning and Applications (CS564)	3	0	0	9
Computer Vision and Image Processing (CS582)	3	0	0	9
Management Information Systems (CS 391)	3	0	0	9
Programming in Business Operations (CS441)	0	0	2	2

1st Semester

2nd Semester

Course/Subject	L	T	P	Cr	Course/Subject	L	T	P	Cr
Classical Physics (IS) (PY111)	3	1	0	11	Modern Physics (IS) (PY112)	2	1	0	8
Inorganic and Physical Chemistry (IS) (CY111)	3	1	0	11	Fundamentals of Electronics Engineering (IE) (EC102)	3	1	2	13
Real Analysis & Calculus (IS) (MA111)	3	1	0	11	Differential Equations (IS) (MA121)	3	1	0	11
Computer Programming (IE) (CS101)	3	1	2	13	Engineering Thermodynamics (IE) (CH161)	3	1	0	11
Biology (IS) (BY101)	2	1	0	8	Computer Sc Engg Practices (EP) (CS102)	1	0	2	5
Engineering Graphics (EP) (EP100)	0	0	3	3	Physics lab (IS) (PY121L)	0	0	2/2	1
Total Credits				57	Chemistry lab (IS) (CY121L)	0	0	2/2	1
Basic English (HU)*	1	2	0	7	Workshop (EP) (ME131)	0	0	2	2
Universal Human values (HU)	1	1	0	5	Total Credits				52
					Community Internship	0	0	5	5

*For students with less proficiency in English

3rd Semester

4th Semester

Course/Subject	L	T	P	Cr	Course/Subject	L	T	P	Cr
Linear Algebra & Complex Analysis (IS) (MA211)	2	1	0	8	Database Management Systems (DC) (CS212)	3	0	2	11
Discrete Mathematics (DC) (CS201)	3	0	0	9	Numerical Methods (IS) (MA141)	2	1	0	8
Data Structure and Algorithm(DC) (CS211)	3	0	2	11	Statistical Methods and Data Analysis (IS) (MA231)	2	1	0	8
Programming with Python (DC) (CS221)	1	0	2	5	Web Technology (IE) (CS222)	3	0	2	11
Graphics and Visual Computing (DC) (CS 231)	2	0	2	8	Computer Organization and Architecture (DC) (CS211)	3	0	0	9
Materials Science (IE) (CH211)	3	1	0	9	Digital Circuits and Systems (DC) (ECE221)	3	1	2	13
Total Credits				50	Total Credits				60

5th Semester

6th Semester

Course/Subject	L	T	P	Cr	Course/Subject	L	T	P	Cr
Operating Systems (DC) (CS311)	3	0	2	11	Design and Analysis of Algorithms (DC) (CS341)	3	0	2	11
Microprocessor Engineering (DC)	3	0	2	11	Computer Networks (DC) (CS351)	3	0	2	11
Theory of Computation (DC) (CS321)	3	0	0	9	Compiler Design (DC) (CS312)	3	0	2	11
DE-1 (DE)	3	0	0	9	DE-2 (DE)	3	0	0	9
Software Engineering (DC) (CS331)	3	0	0	9	Operations Research (DC) (CS391)	3	0	0	9
B.Tech. Project (DP)	0	0	10	10	B.Tech. Project (DP)	0	0	10	10
Total Credits				59	Total Credits				61

Summer Term

Course/Subject	L	T	P	Cr
Summer Project	0	0	0	5

7th Semester

8th Semester

Course/Subject	L	T	P	Cr	Course/Subject	L	T	P	Cr
Mobile Computing (DC) (CS411)	3	0	0	9	Soft Computing (DC) (CS468)	2	0	2	8
DE-3 (DE)	3	0	0	9	Digital Image Processing (DC) CS431	2	0	2	8
OE-1 (OE)	3	0	0	9	DE-4(DE)	3	0	0	9
L/M-1	3	0	0	9	OE-2 (OE)	3	0	0	9
HSS	3	0	0	9	L/M-2	3	0	0	9
B.Tech. Project (DP)	0	0	10	10	Data Mining (DC) (CS458)	2	0	2	8
Total Credits				55	Total Credits				51

Course Credits for B.Tech CSE

Category	Program components	Min	Max	Recommended
HU	Humanities and social science	15	20	19
IS	Science	70	90	86
IE	Institute requirement engineering	40	70	61
EP	Engineering drawing, workshop	18	24	11
LM	Language and management	18	24	18
DC	Departmental core	125	180	179
DE	Departmental elective	30	75	36
OE	Open elective	15	20	18
DP	Project/industrial visit	20	50	35
	Total	440	470	463

IDD – B.Tech in CSE and M.Tech in Artificial Intelligence

7th Semester

8th Semester

Course/Subject	L	T	P	Cr	Course/Subject	L	T	P	Cr
Mobile Computing (DC) (CS411)	3	0	0	9	Soft Computing (DC) (CS468)	2	0	2	8
DE-3 (DE)	3	0	0	9	Digital Image Processing (DC) CS431	2	0	2	8
OE-1 (OE)	3	0	0	9	DE-4(DE)	3	0	0	9
L/M-1	3	0	0	9	OE-2 (OE)	3	0	0	9
HSS	3	0	0	9	L/M-2	3	0	0	9
B.Tech. Project (DP)	0	0	10	10	Thesis	0	0	10	10
Total Credits				55	Total Credits				53

9th Semester

10th Semester

Course/Subject	L	T	P	Cr	Course/Subject	L	T	P	Cr
DE-5 (DE)	3	0	0	9	Thesis	0	0	50	50
DE-6 (DE)	3	0	0	9					
DE-7 (DE)	3	0	0	9					
OE-3 (OE)	3	0	0	9					
OE-4 (OE)	3	0	0	9					
Thesis	0	0	10	10					
Total Credits				55	Total Credits				50