

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

Institute Science Courses

Classical Physics (IS) (PY111)	3	1	0	11
Inorganic and Physical Chemistry(IS) (CY121)	3	1	0	11
Real Analysis & Calculus (IS) (MA111)	3	1	0	11
Biology(IS) (BY101)	2	1	0	8
Modern Physics (IS) (PY112)	2	1	0	8
Differential Equations (IS) (MA121)	3	1	0	11
Physics lab (IS) (PY121L)	0	0	2/2	1
Chemistry lab (IS) (CY121L)	0	0	2/2	1
Linear Algebra & Complex Analysis (IS) (MA211)	2	1	0	8
Numerical Methods (IS) (MA221)	2	1	0	8
Statistical Methods and Data Analysis (IS) (MA231)	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 (ECE102)	3	1	2	13
Web Technology (CS222)	3	1	2	13
Object Oriented Methodologies (DC) (CS224)	3	0	2	11
Engineering Thermodynamics (CH161)	3	1	0	11
Total Credit				61

EP, LM and HU Courses

	Course	L	T	P	Credit
EP	Engineering Graphics (ME121)	0	0	3	3
	Workshop(ME131)	0	0	3	3
	Computer Engineering Practices (CS102)	1	0	2	5
	Total Credit				11
LM	M-1	3	0	0	9
	M-2	3	0	0	9
	Total Credit				18
HU	Universal Human Values (HU101)	1	1	0	5
	Community Internship (HU102)	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
Principles of Programming Languages (DC) CS223	3	0	0	9
Database Management Systems (DC) CS212	3	0	2	11
Computer Organization and Architecture (DC) CS231	3	0	0	9
Signal and Systems (DC)	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				175

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
Machine Design	3	0	0	9
Intelligent Transportation System Design	3	0	0	9
Geometric and solid modelling	3	0	0	9
Total Credit (for 4 selected)				36

Other Departmental Elective Courses

Course	L	T	P	Credit
Artificial Intelligence(CS360)	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 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 Elective Courses

Course	L	T	P	Credit
Remote Sensing and Aerial Photogrammetry (CS382)	3	0	0	9
Computer Vision and Pattern Recognition (CS454)	3	0	0	9
Robotics and Industrial Automation (CS367)	3	0	0	9
Cognition and Cognitive System(CS368)	3	0	0	9
Speech and Language Technology CS491	3	0	0	9
GPS and Adjustment Computation(CS384)	3	0	0	9
Information Coding Theory (CS512)	3	0	0	9
Wireless Sensor Network (CS372)	3	0	0	9
Cyber Security (CS431)	3	0	0	9
Wireless Digital Communication CS481	3	0	0	9
Geoinformatics(CS381)	3	0	0	9
Robot Motion Planning (CS492)	3	0	0	9
Digital Communication System(CS371)	3	0	0	9
UAV Remote Sensing (CS383)	3	0	0	9
Total Credit (for 4 selected)				36

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) (CY121)	3	1	0	11	Fundamentals of Electronics Engineering(IE) (ECE102)	3	1	2	13
Real Analysis & Calculus (IS) (MA111)	3	1	0	11	Differential Equations (IS) (MA121)	3	1	0	11
Computer Programing (IE) (CS101)	3	1	2	13	Engineering Thermodynamics (IE) (CH161)	3	1	0	11
Biology(IS) (IS) (BY101)	2	1	0	8	Computer Sc Engg Practices (EP) (CS102)	1	0	2	5
Engineering Graphics (EP) (ME121)	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)* (LM101)	1	2	0	7	Workshop (EP) (ME131)	0	0	3	2
Universal Human values (HU) (HU101)	1	1	0	5	Total Credits				53
					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)	2	1	0	8	Cyber Security	3	0	2	11
Discrete Mathematics (DC) (CS201)	3	0	0	9	Numerical Methods (IS) (MA221)	2	1	0	8
Data Structure and Algorithm(DC) (CS211)	3	0	2	11	Machine Learning	3	0	0	9
Data Handling and Visualization(DC)	2	0	2	8	Linear Optimization (MT 483)	3	0	0	9
Aerial robotic designing	3	0	2	11	Digital Twin	3	0	0	9
Computer Vision	3	0	0	9	Computer Game Design and Programming	3	0	2	11
Professional Communications	2	1	0	7	Group Discussion	0	0	2	2
Total Credits				63	Total Credits				61

5th Semester

6th Semester

Course/Subject	L	T	P	Cr	Course/Subject	L	T	P	Cr
Animation Design	3	0	2	11	Internet of Things	3	0	2	11
Multimedia technologies (Video/Audio Engg)	3	0	2	11	Biomedical Imaging	3	0	2	11
Artificial Intelligence	3	0	0	9	Spatial Computing	1	0	2	5
DE-1 (DE)	3	0	0	9	Pattern Recognition	3	0	0	9
Software Engineering (DC) (CS331)	3	0	0	9	Web Technology (IE) (CS222)	3	0	2	11
B.Tech. Project (DP)	0	0	10	10	B.Tech. Project (DP)	0	0	10	10
Seminar	0	0	2	0					
Total Credits				58	Total Credits				63

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	Robotics Design	2	0	2	8
Visualization/Virtual Reality	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
M-1	3	0	0	9	OE-2 (OE)	3	0	0	9
HSS-1	2	0	0	6	M-2	3	0	0	9
B.Tech. Project (DP)	0	0	10	10	HSS-2	3	0	0	9
					Information Retrieval	3	0	0	9
Total Credits				52	Total Credits				58

Course Credits for B.Tech Data Science

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	63
EP	Engineering drawing, workshop	18	24	11
LM	Language and management	18	24	18
DC	Departmental core	125	180	175
DE	Departmental elective	30	75	36
OE	Open elective	15	20	18
DP	Project/industrial visit	20	50	35
	Total	440	470	461