

COURSE STRUCTURE  
for  
B Tech Degree  
in  
Information Technology

# Streams in Information Technology

1. IT and Geoinformatics Engineering
2. Modern Robotics
3. Digital Communication

	<b>IT and Geoinformatics Engineering</b>	<b>Modern Robotics</b>	<b>Digital Communication</b>
DE1	Geoinformatics CS381 or Remote Sensing and Aerial Photogrammetry CS382 or UAV Remote Sensing CS383	Robotics and Industrial Automation CS 367	Digital Communication System CS 371
DE2	GPS and Adjustment Computation CS 384	Cognition and Cognitive System CS368	Wireless Sensor Network CS 372
DE3	Geographic Information System CS481 or Data Analytics CS 457	Speech and Language Technology CS491 or Natural Language Processing CS 466	Wireless Digital Communication CS 481
DE4	Computer Vision and Pattern Recognition CS 454 or Artificial Intelligence CS 360	Robot Motion Planning CS 492 or Artificial Intelligence CS 360	Artificial Intelligence CS 360 or Cyber Security CS 431

# 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

<b>Course</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credit</b>
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
<b>Total Credit</b>				<b>61</b>

# 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
	<b>Total Credit</b>				<b>11</b>
LM	M-1	3	0	0	9
	M-2	3	0	0	9
	<b>Total Credit</b>				<b>18</b>
HU	Universal Human Values (HU101)	1	1	0	5
	Community Internship (HU102)	1	1	0	5
	Humanities	3	0	0	9
	<b>Total Credit</b>				<b>19</b>

# 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
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
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

## 1<sup>st</sup> Semester

## 2<sup>nd</sup> 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
<b>Total Credits</b>				<b>57</b>	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	<b>Total Credits</b>				<b>53</b>
					Community Internship	0	0	5	5

\*For students with less proficiency in English

### 3<sup>rd</sup> Semester

### 4<sup>th</sup> 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) (MA221)	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
Principles of Programming Languages (DC) (CS223)	3	0	0	9	Web Technology (IE) (CS222)	3	0	2	11
Graphics and Visual Computing (DC) (CS 231)	2	0	2	8	Computer Organization and Architecture (DC) (CS231)	3	0	0	9
Object Oriented Methodologies (DC) (CS224)	3	0	2	11	Digital Circuits and Systems (ECE 221)	3	1	2	13
Professional Communications	2	1	0	7	Group Discussion	0	0	2	2
<b>Total Credits</b>				<b>63</b>	<b>Total Credits</b>				<b>62</b>

## 5<sup>th</sup> Semester

## 6<sup>th</sup> Semester

Course/Subject	L	T	P	Cr	Course/Subject	L	T	P	Cr
Operating Systems (DC) (CS311)	3	0	2	11	Software Engineering (DC) (CS331)	3	0	0	9
Microprocessor and Embedded System (ECE321)	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
Design and Analysis of Algorithms (DC) (CS341)	3	0	2	11	Linear Optimization (MT 483)	2	0	2	8
B.Tech. Project (DP)	0	0	10	10	Data Mining (CS458) (DC)	2	0	2	8
Seminar	0	0	2	2	B.Tech. Project (DP)	0	0	10	10
<b>Total Credits</b>				<b>63</b>	<b>Total Credits</b>				<b>66</b>

## Summer Term

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

## 7<sup>th</sup> Semester

## 8<sup>th</sup> 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
<b>M-1</b>	3	0	0	9	<b>HSS-2</b>	2	0	0	6
<b>HSS-1</b>	2	0	0	6	OE-2 (OE)	3	0	0	9
B.Tech. Project (DP)	0	0	10	10	<b>M-2</b>	3	0	0	9
<b>Total Credits</b>				<b>52</b>	<b>Total Credits</b>				<b>49</b>

# Course Credits for B Tech IT

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
	<b>Total</b>	<b>440</b>	<b>470</b>	<b>461</b>