

**B.TECH. COMPUTER SCIENCE AND ENGINEERING -Computer Science Stream**

Year	FIRST SEMESTER						SECOND SEMESTER						
	Course Code	Course Name	L	T	P	C	Course Code	Course Name	L	T	P	C	
I	MAT 1102	Computational Mathematics - I	3	1	0	4	MAT 1202	Computational Mathematics - II	3	1	0	4	
	PHY 1002	Applied Physics for Engineers	3	0	0	3	CHM1002	Applied Chemistry for Engineers	3	0	0	3	
	ECE 1002	Fundamentals of Electronics	2	1	0	3	ELE 1002	Fundamentals of Electrical Engineering	3	0	0	3	
	CSS 1001	Programming for Problem Solving	2	1	0	3	CIV 1002	Engineering Mechanics and Smart Buildings	2	1	0	3	
	MME 1002	Basic Mechanical Engineering Science	3	0	0	3	CSS 1002	Introduction to Object Oriented Programming	3	0	0	3	
	HUM 1001	Communication Skills in English	1	0	2	2	CIV 1003	Environmental Studies	1	0	2	2	
	HUM 1002	Universal Human Values and Professional Ethics (MLC)	1	0	0	1	CSS 1012	Data Visualization	1	0	3	2	
	HUM 1003	Human Rights and Constitution (MLC)	1	0	0	1	CSS 1013	Introduction to Object Oriented Programming Lab	0	0	3	1	
	MME 1011	Workshop Practice	0	0	3	1	MME 1012	Computer Aided Engineering Graphics	0	0	3	1	
	CSS 1011	Programming for Problem Solving Lab	0	0	3	1							
<b>Total Contact Hours (L + T + P)</b>			<b>16</b>	<b>3</b>	<b>8</b>	<b>22</b>	<b>Total Contact Hours (L + T+ P)</b>			<b>16</b>	<b>2</b>	<b>11</b>	<b>22</b>

Year	THIRD SEMESTER						FOURTH SEMESTER						
	Course Code	Course Name	L	T	P	C	Course Code	Course Name	L	T	P	C	
II	MAT ****	Discrete Mathematical Structures	3	0	0	3	MAT ****	Probability and Optimization	3	0	0	3	
	CSS ****	Data Structures	3	1	0	4	CSS ****	Database Systems	3	1	0	4	
	CSS ****	Data Communication and Computer Networks	3	1	0	4	CSS ****	Design & Analysis of Algorithms	3	1	0	4	
	CSS ****	Data Analytics	3	1	0	4	CSS ****	Introduction to Artificial Intelligence	3	0	0	3	
	CSS ****	Digital Systems and Computer Organization	4	0	0	4	CSS ****	Operating Systems	3	0	0	3	
	CSS ****	Data Structures Lab	0	0	3	1	CSS ****	Operating Systems Lab	0	0	3	1	
	CSS ****	Digital Systems lab	0	0	3	1	CSS ****	Database Systems Lab	0	0	3	2	
							CSS ****	Object-Oriented Software Development Lab	0	1	3	2	
<b>Total Contact Hours (L + T + P)</b>			<b>16</b>	<b>3</b>	<b>6</b>	<b>21</b>	<b>Total Contact Hours (L + T + P)</b>			<b>15</b>	<b>3</b>	<b>9</b>	<b>22</b>
<b>FIFTH SEMESTER</b>						<b>SIXTH SEMESTER</b>							
III	HUM ****	Essentials of Management	3	0	0	3	HUM ****	Engineering Economics and Financial Management	3	0	0	3	
	CSS ****	Finite Automata and Compiler Design	3	1	0	4	CSO ****	CS Specialization (S4)	3	0	3	4	
	CSO ****	CS Specialization (S1)	3	0	3	4	CSO ****	CS Specialization (S5)	3	0	3	4	
	CSO ****	CS Specialization (S2)	3	0	3	4	CSP ****	Program Elective 1/ Minor 1	3	0	0	3	
	CSO ****	CS Specialization (S3)	3	0	3	4	CSP ****	Program Elective 2/ Minor 2	3	0	0	3	
	IOE ****	OPEN ELECTIVE – 1 (MLC)	3	0	0	3	IOE ****	Open Elective – 2 (MLC)	3	0	0	3	
			<b>18</b>	<b>1</b>	<b>9</b>	<b>22</b>			<b>18</b>	<b>0</b>	<b>6</b>	<b>20</b>	
<b>Total Contact Hours (L + T + P)</b>			<b>28</b>			<b>Total Contact Hours (L + T + P)</b>			<b>24</b>				
<b>SEVENTH SEMESTER</b>						<b>EIGHTH SEMESTER</b>							
IV	CSP ****	Program Elective 3/ Minor 3	3	0	0	3	CSS ****	Internship (MLC)				1	
	CSP ****	Program Elective 4/ Minor 4	3	0	0	3	CSS ****	Capstone Project				12	
	CSP ****	Program Elective 5	3	0	0	3	CSS ****	Capstone Project (Honours)^				20	
	CSP ****	Program Elective 6	3	0	0	3	CSS ****	Honours Course 1^				4	
	CSP ****	Program Elective 7	3	0	0	3	CSS ****	Honours Course 2^				4	
	IOE ****	OPEN ELECTIVE – 3 (MLC)	3	0	0	3	CSS ****	Honours Course 3^				4	
		Minor Specialization Project *				8							
<b>Total Contact Hours (L + T + P)</b>			<b>18</b>	<b>0</b>	<b>0</b>	<b>18/26*</b>	<b>Total Contact Hours (L + T + P)</b>					<b>13/33^</b>	

## **List of Specializations**

### A. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

- CSO \*\*\*\* Foundations of Computer Vision
- CSO \*\*\*\* Machine Learning
- CSO \*\*\*\* Parallel Computer Architecture and Programming
- CSO \*\*\*\* Deep Learning and Applications
- CSO \*\*\*\* Natural Language Processing

### B. NETWORKS AND IOT

- CSO \*\*\*\* Wireless Communication and Networking
- CSO \*\*\*\* Network Protocols and Programming
- CSO \*\*\*\* Cloud Computing
- CSO \*\*\*\* Network Security
- CSO \*\*\*\* Embedded Systems and IoT

### C. DATA SCIENCE

- CSO \*\*\*\* Data Privacy and Security
- CSO \*\*\*\* Machine Learning
- CSO \*\*\*\* Parallel Computer Architecture and Programming
- CSO \*\*\*\* Deep Learning & Applications
- CSO \*\*\*\* Generative AI

### D. SOFTWARE ENGINEERING

- CSO \*\*\*\* Software Design Technology
- CSO \*\*\*\* DevOps - Using AI
- CSO \*\*\*\* Full Stack Application Development
- CSO \*\*\*\* Human Computer Interaction
- CSO \*\*\*\* Knowledge and Data Engineering

### E. OTHER COURSES OFFERED

- CSO \*\*\*\* Principles of Cryptography
- CSO \*\*\*\* Machine Learning
- CSO \*\*\*\* Parallel Computer Architecture and Programming
- CSO \*\*\*\* Software Engineering
- CSO \*\*\*\* Cloud Computing & DevOps

## List of Minor Specializations

### I. SECURITY

1. CSP \*\*\*\* Advanced Cryptography and Cryptanalysis
2. CSP \*\*\*\* Database and Web Security
3. CSP \*\*\*\* AIML Techniques in Cyber Security
4. CSP \*\*\*\* Cyber Forensics and Cyber laws

### II. MULTIMODAL DATA ANALYTICS

1. CSP \*\*\*\* Information Retrieval
2. CSP \*\*\*\* Graph Analytics
3. CSP \*\*\*\* Image and Video Analysis
4. CSP \*\*\*\* Social Network Analysis 1

### III. HEALTH CARE ANALYTICS

1. CSP \*\*\*\* Health Informatics
2. CSP \*\*\*\* Bioinformatics
3. CSP \*\*\*\* Medical Image Processing
4. CSP \*\*\*\* Biostatistics

## List of Program Electives

- CSP \*\*\*\* Internet of Things and Applications
- CSP \*\*\*\* Augmented and Virtual Reality
- CSP \*\*\*\* Conversational AI
- CSP \*\*\*\* iOS Application Development
- CSP \*\*\*\* Blockchain Technology
- CSP \*\*\*\* Wireless Technologies
- CSP \*\*\*\* Foundations of Quantum Computing
- CSP \*\*\*\* Reinforcement Learning
- CSP \*\*\*\* Mobile Application Development
- CSP \*\*\*\* Foundations and Ethics of Generative AI
- CSP \*\*\*\* Prompt Engineering
- CSP \*\*\*\* Product Management
- CSP \*\*\*\* Enterprise Data Architecture
- CSP \*\*\*\* Optimization Techniques
- CSP \*\*\*\* Data Forensics
- CSP \*\*\*\* Deep Learning
- CSP \*\*\*\* Machine Learning Tools & Technology
- CSP \*\*\*\* Web Technologies
- CSP \*\*\*\* Game Theory and Applications
- CSP \*\*\*\* Explainable AI
- CSP \*\*\*\* System and Network Security
- CSP \*\*\*\* User Interface Engineering
- CSP \*\*\*\* Semantic Web