



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**  
**KAKINADA – 533 003, Andhra Pradesh, India**

## **COURSE STRUCTURE AND SYLLABUS**

**For UG – R20**

**B. Tech - COMPUTER SCIENCE AND DESIGN**

*(Applicable for batches admitted from 2020-2021)*



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## COURSE STRUCTURE

### I Year – I SEMESTER

S. No	Course Code	Subjects	L	T	P	Credits
1	HS1101	Communicative English	3	0	0	3
2	BS1101	Mathematics – I	3	0	0	3
3	BS1102	Applied Chemistry	3	0	0	3
4	ES1101	Programming for Problem Solving using C	3	0	0	3
5	ES1102	Design Drawing and Visualization	1	0	4	3
6	HS1102	English Communication Skills Laboratory	0	0	3	1.5
7	BS1103	Applied Chemistry Lab	0	0	3	1.5
8	ES1103	Programming for Problem Solving using C Lab	0	0	3	1.5
9	MC1101	Environmental Science*	2	0	0	0
<b>Total Credits</b>			<b>15</b>	<b>0</b>	<b>13</b>	<b>19.5</b>

### I Year – II SEMESTER

S. No	Course Code	Subjects	L	T	P	Credits
1	BS1201	Mathematics – II	3	0	0	3
2	BS1202	Applied Physics	3	0	0	3
3	ES1201	Digital Logic Design	3	0	0	3
4	ES1202	Python Programming	3	0	0	3
5	CS1201	Data Structures	3	0	0	3
6	BS1203	Applied Physics Lab	0	0	3	1.5
7	ES1203	Python Programming Lab	0	0	3	1.5
8	CS1202	Data Structures Lab	0	0	3	1.5
9	MC1201	Constitution of India *	2	0	0	0
<b>Total Credits</b>			<b>17</b>	<b>0</b>	<b>9</b>	<b>19.5</b>

\*Internal Evaluation



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**II Year – I SEMESTER**

S.No	Course Code	Courses	L	T	P	Credits
1	BS2101	Mathematics - III	3	0	0	3
2	CS2101	Mathematical Foundations of Computer Science	3	0	0	3
3	CS2102	Computer Graphics	3	0	0	3
4	CS2103	Multimedia and Application Development	3	0	0	3
5	CS2104	Database Management Systems	3	0	0	3
6	CS2105	Computer Graphics Lab	0	0	3	1.5
7	CS2106	Multimedia and Application Development Lab	0	0	3	1.5
8	CS2107	Database Management Systems Lab	0	0	3	1.5
9	SO2101	Mobile App Development	0	0	4	2
10	MC2101	Essence of Indian Tradition Knowledge	2	0	0	0
<b>Total Credits</b>			<b>17</b>	<b>0</b>	<b>13</b>	<b>21.5</b>

**II Year – II SEMESTER**

II Year – II SEMESTER						
S. No	Course Code	Courses	L	T	P	Credits
1	BS2201	Probability and Statistics	3	0	0	3
2	CS2201	Computer Organization	3	0	0	3
3	CS2202	Data Warehousing and Mining	3	0	0	3
4	ES2201	Visual Design and Communication	3	0	0	3
5	HS2201	Managerial Economics and Financial Accountancy	3	0	0	3
6	CS2203	Games Development Lab	0	0	3	1.5
7	CS2204	Data Mining using Python Lab	0	0	3	1.5
8	ES2202	Web Application Development Lab	0	0	3	1.5
9	SO2201	Digital Photography using Adobe Photoshop	0	0	4	2
<b>Total Credits</b>						<b>21.5</b>
10	Minor	Human Computer Interaction	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>



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<b>III B. Tech – I Semester</b>						
S.No	Course Code	Courses	Hours per week			Credits
			L	T	P	
1	PC	Compiler Design	3	0	0	3
2	PC	Operating Systems	3	0	0	3
3	PC	Human Computer Interaction	3	0	0	3
4	Open Elective/Job Oriented	<b>Open Elective-I</b> Open Electives offered by other departments/ Optimization in Operations Research(Job oriented course)	3	0	0	3
5	PE	<b>Professional Elective-I</b> 1. Software Engineering 2. Object Oriented Analysis and Design 3. DevOps 4. Internet of Things	3	0	0	3
6	PC	Operating Systems & Compiler Design Lab	0	0	3	1.5
7	PC	Human Computer Interaction Lab	0	0	3	1.5
8	SO	<b>Skill Oriented Course - III</b> 1. Animation course: Animation Design 2. Continuous Integration and Continuous Delivery using DevOps	0	0	4	2
9	MC	Employability Skills-I	2	0	0	0
10	PR	<b>Summer Internship 2 Months(Mandatory) after second year(to be evaluated during V semester</b>	0	0	0	1.5
<b>Total credits</b>						<b>21.5</b>
11	Minor	Visual Design and Communication	4	0	0	4



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<b>III B. Tech – II Semester</b>						
S.No	Course Code	Courses	Hours per week			Credits
			L	T	P	
1	PC	Computer Networks	3	0	0	3
2	PC	Computer Aided Design	3	0	0	3
3	PC	Design and Analysis of Algorithms	3	0	0	3
4	PE	<b>Professional Elective-II</b> 1. Deep Learning 2. Software Project Management 3. Distributed Systems 4. Network Programming	3	0	0	3
5	Open Elective/Job Oriented	<b>Open Elective-II</b> Open Electives offered by other departments/ MEAN Stack Development (Job Oriented Course)	3	0	0	3
6	PC	Computer Networks Lab	0	0	3	1.5
7	PC	Computer Aided Design Lab	0	0	3	1.5
8	PC	Algorithms for Efficient Coding Lab	0	0	3	1.5
9	SO	<b>Skill Oriented Course - IV</b> 1. Big Data: Spark 2. MEAN Stack Technologies-Module I- MongoDB, Express.js, Angular JS Node.js and AJAX	0	0	4	2
10	MC	Employability skills-II	2	0	0	0
<b>Total credits</b>						<b>21.5</b>
<b>Industrial/Research Internship(Mandatory) 2 Months during summer vacation</b>						
11	Minor	Computer Vision	4	0	0	4
<b>Minor courses through SWAYAM</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>



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<b>IV B. Tech –I Semester (Tentative)</b>						
S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	PE	<b>Professional Elective-III</b> 1. Reinforcement Learning 2. Nature Inspired Computing Techniques 3. Cryptography and Network Security 4. Block Chain Technologies	3	0	0	3
2	PE	<b>Professional Elective-IV</b> 1. Robotic Process Automation 2. Cloud Computing 3. Computer Vision 4. NOSQL Databases	3	0	0	3
3	PE	<b>Professional Elective-V</b> 1. Social Network Analysis 2. Recommender Systems 3. AI Chat bots 4. Data Visualization	3	0	0	3
4	Open Elective /Job Oriented	<b>Open Elective-III</b> Open Electives offered by other departments/ API and Microservices (Job Oriented Course)	3	0	0	3
5	Open Elective /Job Oriented	<b>Open Elective-IV</b> Open Electives offered by other departments/ Secure Coding Techniques (Job Oriented Course)	3	0	0	3
6	HS	Universal Human Values 2: Understanding Harmony	3	0	0	3
7	SO	1.Virtual Reality with Unity (Infosys Spring Board) 2.MEAN Stack Technologies-Module II- MongoDB, Express.js, Angular JS Node.js, and AJAX	0	0	4	2
8	PR	<b>Industrial/Research Internship 2 months (Mandatory) after third year (to be evaluated during VII semester)</b>	0	0	0	3
<b>Total credits</b>						<b>23</b>
9	Minor	Computer Aided Design	4	0	0	4
<b>Minor courses through SWAYAM</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>



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<b>IV B. Tech –II Semester</b>						
S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	Project	Major Project Work, Seminar, Internship	-	-	-	<b>12</b>
<b>Total credits</b>						<b>12</b>



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**Suggested Courses MINOR Engineering in B.Tech. CSE- CSD**

**Eligibility for Minor in CSE - CSD:-**

**Note:**

1. TWO, NPTEL courses of EIGHT week duration covering a total of 4 credits (offered by CSE Department only), Student can register at any time after the completion of II B.Tech. I Sem.

S.No.	Subject Title	Credits
1	Human Computer Interaction	4
2	Visual Design and Communication	4
3	Computer Vision	4
4	Computer Aided Design	4
5	MOOCS Courses ** 1. Computer Graphics (NPTEL) ( <a href="https://nptel.ac.in/courses/106103224">https://nptel.ac.in/courses/106103224</a> ) 2. Design for Internet of Things(NPTEL) ( <a href="https://nptel.ac.in/courses/108108179">https://nptel.ac.in/courses/108108179</a> ) 3. Block chain and its applications (NPTEL) ( <a href="https://nptel.ac.in/courses/106105235">https://nptel.ac.in/courses/106105235</a> ) 4. Design and Engineering of Computer Systems (NPTEL) ( <a href="https://nptel.ac.in/courses/106101234">https://nptel.ac.in/courses/106101234</a> )	4
	<b>Total</b>	<b>20</b>

\*\*Choose 02 MOOCS courses @ 2credits each from SWAYAM/NPTEL