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

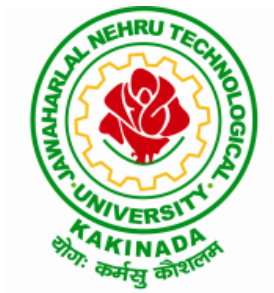**DEPARTMENT OF CSE - COMPUTER SCIENCE &TECHNOLOGY**

COURSE STRUCTURE
For UG – R20

B. Tech - COMPUTER SCIENCE & ENGINEERING with Specialization

COMPUTER SCIENCE &TECHNOLOGY

(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	BS1101	Mathematics - I	3	0	0	3
2	BS1104	Applied Physics	3	0	0	3
3	HS1101	Communicative English	3	0	0	3
4	ES1101	Computer Engineering Workshop	1	0	4	3
5	ES1102	Programming for Problem Solving Using C	3	0	0	3
6	HS1102	English Communication skills Laboratory	0	0	3	1.5
7	BS1105	Applied Physics Lab	0	0	3	1.5
8	ES1103	Programming for Problem Solving Using C Lab	0	0	3	1.5
		Total Credits				**19.5**

I Year – II SEMESTER

S. No	Course Code	Subjects	L	T	P	Credits
1	BS1202	Mathematics – II	3	0	0	3
2	BS1206	Applied Chemistry	3	0	0	3
3	ES1204	Problem Solving Using Python	3	0	0	3
4	ES1205	Basic Electrical& Electronics Engineering	3	0	0	3
5	ES1206	Digital Logic Design	3	0	0	3
6	ES1207	Problem Solving Using Python Lab	0	0	3	1.5
7	BS1207	Applied Chemistry Lab	0	0	3	1.5
8	ES1208	Digital Logic Design Lab	0	0	3	1.5
9	MC1203	Constitution of India	2	0	0	0
		Total Credits				**19.5**

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II Year – I SEMESTER

S. No	Course Code	Course Title	L	T	P	C
1.	BSC2101	Mathematics – III	3	0	0	3
2.	PCC2101	Mathematical Foundations of Computer Science	3	0	0	3
3.	PCC2102	Data Structures	3	0	0	3
4.	PCC2103	Operating Systems	3	0	0	3
5.	PCC2104	Java Programming	3	0	0	3
6.	PCC2105	Data Structures Lab	0	0	3	1.5
7.	PCC2106	OS&UNIX Programming Lab	0	0	3	1.5
8.	PCC2107	Java Programming Lab	0	0	3	1.5
9.	SC2101	Free and Open Source Software	0	0	4	2
10.	MC2101	Essence of Indian Traditional Knowledge	2	0	0	0
		TOTAL				**21.5**

II Year – II SEMESTER

S. No.	Course Code	Course Title	L	T	P	C
1.	ESC2201	Computer Organization& Architecture	3	0	0	3
2.	BSC2201	Probability and Statistics	3	0	0	3
3.	PCC2201	Formal Languages & Automata Theory	3	0	0	3
4.	PCC2202	Database Management System	3	0	0	3
5.	HSMC2201	Managerial Economics and Financial Accountancy	3	0	0	3
6.	ESC2202	Computer Organization& Architecture Lab	0	0	3	1.5
7.	PCC2203	R Programming Lab	0	0	3	1.5
8.	PCC2204	Database Management System Lab	0	0	3	1.5
9.	SC2201	Android Application Development	0	0	4	2
		TOTAL				**21.5**
		Minor courses **(The hours distribution can be 3-0-2 or 3-1-0 also)**	4	0	0	4
		Internship 2 Months (Mandatory) during summer vacation				

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III Year – I SEMESTER

S.No.	Course Code	Course Title	L	T	P	C
1	PCC3101	Computer Networks	3	0	0	3
2	PCC3102	Software engineering	3	0	0	3
3.	PCC3103	Compiler Design	3	0	0	3
4.	OEC3101	**Open Elective-I** Open Electives offered by other departments/ Natural Language Processing (Job oriented course)	2	0	2	3
5.	PEC3101	**Professional Elective Courses – I** 1.Computer Graphics 2. Principles of Programming Languages 3. Advanced Data Structures 4. Advanced Computer Architecture 5. Artificial Intelligence	3	0	0	3
6.	PCC3104	Network Programming Lab	3	0	0	1.5
7	PCC3105	Software engineering Lab	0	0	3	1.5
8	SC3101	Web Application Development Using Full Stack – Frontend Development –Module -I	0	0	4	2
9.	MC3101	Environmental Science	2	0	0	0
		Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester	0	0	0	1.5
		Total				21.5
		Honors/Minor courses	4	0	0	4

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III Year – II SEMESTER

S. No.	Course Code	Course Title	L	T	P	C
1	PCC3201	Web Technologies	3	0	0	3
2.	PCC3202	Machine Learning	3	0	0	3
3.	PCC3203	Design and Analysis of Algorithms	3	0	0	3
4.	PEC3201	**Professional Elective Courses-II** (NPTEL/SWAYAM) **Duration: 12 Weeks Minimum** ***Course/subject title can't be repeated**	3	0	0	3
5.	OEC3201	**Open Elective-II** Open Electives offered by other departments/ Social Network and Semantic Web (Job Oriented Course)	2	0	2	3
6.	PCC3204	Web Technologies Lab	0	0	3	1.5
7.	PCC3205	Machine Learning Lab	0	0	3	1.5
8.	PCC3206	Arduino Lab	0	0	3	1.5
9.	SC3201	Web Application Development Using Full Stack - Frontend Development –Module -II	0	0	4	2
10.	MC3201	Employability Skills	2	0	0	0
		Total				21.5
		Honors/Minor courses	4	0	0	4
		Honors/Minor courses through SWAYAM	0	0	0	2
		Industrial/Research Internship (Mandatory) 2 Months during summer vacation				

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IV Year – I SEMESTER

S.No.	Course Code	Course Title	L	T	P	C
1	PEC4101	**Professional Elective courses – III** 1.Mobile Computing 2. Data Science 3. NoSQL Databases 4. Internet of Things 5. Software Testing Methodologies	3	0	0	3
2.	PEC4102	**Professional Elective courses – IV** 1. Web Services 2. Cloud Computing 3. Mean Stack Technologies 4. Ad-hoc and Sensor Networks 5. Cyber Security & Forensics	3	0	0	3
3.	PEC4103	**Professional Elective courses – V** 1.Deep Learning 2. Quantum Computing 3. DevOps 4. Blockchain Technologies 5. Big Data Analytics	3	0	0	3
4.	OEC4101	**Open Elective-III** Open Electives offered by other departments/ Middleware Technologies (Job Oriented Course)	2	0	2	3
5.	OEC4102	**Open Elective-IV** Open Electives offered by other departments/ Multimedia And Rich Internet Applications (Job Oriented Course)	2	0	2	3
6.	HSMC4101	**Humanities and Social Science Elective** 1.Universal Human Values 2.Human Resources Development 3.Business Intelligence 4. Management And Organisational Behaviour 5. Strategic Management	3	0	0	3
7.	SC4101	Multimedia Application Development	0	0	4	2
8		Industrial/Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester)	0	0	0	3
		Total credits				**23**
		Honors/Minor courses	4	0	0	4
		Honors/Minor courses through SWAYAM	0	0	0	2

IV Year – II SEMESTER

S. No.	Category	Code	Course Title	Hours per week			Credits
1	Major Project	PROJ	Project Project work, seminar and internship in industry	-	-	-	12
	INTERNSHIP (6 MONTHS)						
			Total credits				**12**

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DEPARTMENT OF CSE - COMPUTER SCIENCE &TECHNOLOGY
Open Electives to be offered by CST for Other Branches:

Open Elective I:	Open Elective II:
1. Data Structures	1. Problem Solving using Python
2. Java Programming	2. Web Technologies
3. Data Base Management Systems	3.Computer Networks
4. Operating Systems	4.Computer graphics
Open Elective III:	**Open elective IV:**
1. Big Data Analytics	1.Data science
2. Artificial Intelligence	2.Mean stack technologies
3.Data Warehousing & Data mining	3.Machine learning
4.Internet of Things	4.Cloud Computing

Minor Degree in CST offered to other branches

S. No	Year and Sem	Subject Title	L	T	P	C
1	II Year II Sem	Natural Language Processing	3	1	0	4
2	III Year I Sem	Software Project Management	3	1	0	4
3	III Year II Sem	Cloud Computing	3	1	0	4
4	IV Year I Sem	Cryptography and Network Security	3	1	0	4
5		1) Artificial Intelligence 2) Introduction to Operating Systems 3) Database Management System 4) Machine Learning **Any 2 courses (2 credits each) mentioned above from NPTEL/SWAYAM				4
					Grand Total	20

Note: Out of the 20 Credits, 16 credits shall be earned by specified courses listed above. In addition to the 16 credits, students must pursue at least 2 courses through MOOCs. The courses must be of minimum 8 weeks in duration. Student can register at any time after the completion of II B.Tech. I Sem.

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Honors Degree in CST

S. No	Year and Sem	Subject Title	L	T	P	C
1	II Year II Sem	Advance Computer Architecture	3	1	0	4
2	III Year I Sem	Soft Computing	3	1	0	4
3	III Year II Sem	Next Generation databases	3	1	0	4
4	IV Year I Sem	Service Oriented Architecture and Web Security	3	1	0	4
5		MOOCS Courses ** 1) User centric computing for Human Computer Interaction 2) Big Data Computing 3) Scalable Data Science 4) Multi Core Computer Architecture Storage and Interconnects **Any 2 courses (2 credits each) mentioned above from NPTEL/SWAYAM				4
					Grand Total	20