



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**KAKINADA – 533 003, Andhra Pradesh, India**

**DEPARTMENT OF CSE –INTERNET OF THINGS (IoT)**

## **COURSE STRUCTURE**

**For UG – R20**

**B. Tech - COMPUTER SCIENCE & ENGINEERING with Specialization**

**Common to**

- (i) CSE (INTERNET OF THINGS) – Branch Code:49**
- (ii) INTERNET of THINGS - Branch Code:60**

*(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
<b>Total Credits</b>						<b>19.5</b>

**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
<b>Total Credits</b>						<b>19.5</b>


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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
<b>TOTAL</b>						<b>21.5</b>

**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 Systems	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 Systems Lab	0	0	3	1.5
9.	SC2201	Android Application Development	0	0	4	2
<b>TOTAL</b>						<b>21.5</b>
	<b>Minor courses</b> <b>(The hours distribution can be 3-0-2 or 3-1-0 also)</b>		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	Design and Analysis of Algorithms	3	0	0	3
2	PCC3102	IoT Architecture and its Protocols	3	0	0	3
3.	PCC3103	Computer Networks	3	0	0	3
4.	OEC3101	<b>Open Elective-I</b> Open Electives offered by other departments/ Natural Language Processing (Job oriented course)	3	0	0	3
5.	PEC3101	<b>Professional Elective Courses – I</b> 1. Compiler Design 2. Principles of Programming Languages 3. Software Engineering 4. Computer Graphics 5. Advanced Computer Architecture	3	0	0	3
6.	PCC3104	Network Programming lab	0	0	3	1.5
7	PCC3105	Internet of Things 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
		<b>Minor courses</b>	4	0	0	4


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**III Year – II SEMESTER**

S. No	Course Code	Course Title	L	T	P	C
1	PCC3201	Embedded System Design	3	1	0	3
2.	PCC3202	Machine Learning	3	0	0	3
3.	PCC3203	Sensors and Actuator Devices for IoT	3	0	0	3
4.	PEC3201	Professional Elective Courses-II (NPTEL/SWAYAM) <b>Duration: 12 Weeks Minimum</b> <b>*Course/subject title can't be repeated</b>	3	0	0	3
5.	OEC3201	<b>Open Elective-II</b> Open Electives offered by other departments/ Social Network and Semantic Web (Job Oriented Course)	3	0	0	3
6.	PCC3204	Embedded System Design Lab	0	0	3	1.5
7.	PCC3205	Machine Learning Lab	0	0	3	1.5
8.	PCC3206	Sensors and Actuator Devices for IoT 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
	Minor courses		4	0	0	4
	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	<b>Professional Elective courses – III</b> 1 Mobile Computing 2. Data Science 3. NoSQL Databases 4. Privacy and Security in IOT 5. Programming and Interfacing with Microcontrollers	3	0	0	3
2.	PEC4102	<b>Professional Elective courses – IV</b> 1. Fog Computing 2. Cloud Computing 3. Mean Stack Technologies 4. Big Data Analytics for IoT 5. Cyber Security & Forensics	3	0	0	3
3.	PEC4103	<b>Professional Elective courses – V</b> 1. Deep Learning 2. Wearable Computing 3. DevOps 4. Blockchain Technologies 5. Software Testing Methodologies	3	0	0	3
4.	OEC4101	<b>Open Elective-III</b> Open Electives offered by other departments/ Middleware Technologies (Job Oriented Course)	3	0	0	3
5.	OEC4102	<b>Open Elective-IV</b> Open Electives offered by other departments/ Multimedia And Rich Internet Applications (Job Oriented Course)	3	0	0	3
6.	HSMC4101	<b>Humanities and Social Science Elective</b> 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
Minor courses			4	0	0	4
Minor courses through SWAYAM			0	0	0	2



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**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

**Open Electives to be offered by IoT for Other Branches:**

<b>Open Elective I:</b> 1. Data Structures 2. Computer Networks 3. Data Base Management System 4. Problem Solving using Python	<b>Open Elective II:</b> 1. operating systems 2. Web Technologies 3. IoT Architecture and its Protocols 4. Artificial Intelligence
<b>Open Elective III:</b> 1. Big Data Analytics for IoT 2. Sensors and Actuator Devices for IoT 3. Embedded System Design 4. Data Science	<b>Open Elective IV:</b> 1. Programming and Interfacing with Microcontrollers 2. Cryptography and Network Security 3. Machine Learning 4. Mean Stack Technologies

**Minor Degree in IoT offered to other branches**

S.No	Year and Sem	Subject Title	L	T	P	C
1	II Year II Sem	IoT Architecture and its Protocols	3	1	0	4
2	III Year I Sem	Sensors and Actuator Devices for IoT	3	0	2	4
3	III Year II Sem	Privacy and Security in IOT	3	1	0	4
4	IV Year I Sem	Cloud Computing	3	1	0	4
5		02 MOOCS courses @ 2credits each ** 1. Introduction to Industry 4.0 and Industrial Internet of Things 2. Google Cloud Computing Foundations 3. Introduction to Embedded System Design 4. Wireless Ad Hoc and Sensor Networks				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.

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