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
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 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
		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	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	**Open Elective-I** Open Electives offered by other departments/ Natural Language Processing (Job oriented course)	3	0	0	3
5.	PEC3101	**Professional Elective Courses – I** 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
		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	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) **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)	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	**Professional Elective courses – III** 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	**Professional Elective courses – IV** 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	**Professional Elective courses – V** 1. Deep Learning 2. Wearable Computing 3. DevOps 4. Blockchain Technologies 5. Software Testing Methodologies	3	0	0	3
4.	OEC4101	**Open Elective-III** Open Electives offered by other departments/ Middleware Technologies (Job Oriented Course)	3	0	0	3
5.	OEC4102	**Open Elective-IV** Open Electives offered by other departments/ Multimedia And Rich Internet Applications (Job Oriented Course)	3	0	0	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**
		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
			INTERNAL (6 MONTHS)				
						Total Credits	12

Open Electives to be offered by IoT for Other Branches:

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