JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA–533003, Andhra Pradesh, India
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

For

B.TECH – ELECTRICAL AND ELECTRONICS ENGINEERING

(Applicableforbatchesadmittedfrom2020-2021)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA-533003, Andhra Pradesh, India

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I B.Tech – I SEMESTER

Sl. No	Course Components	Subjects	L	T	P	Credits
1	HSMC	Communicative English	3	0	0	3
2	BSC	Mathematics-I (Calculus and Differential Equations)	3	0	0	3
3	BSC	Mathematics-II (Linear Algebra and Numerical Methods)	3	0	0	3
4	ESC	Programming for Problem Solving Using C	3	0	0	3
5	ESC	Engineering Drawing & Design	1	0	4	3
6	HSMC	EnglishCommunicationSkillsLaboratory	0	0	3	1.5
7	BSC	Electrical Engineering Workshop	0	1	3	1.5
8	ESC	Programming for Problem Solving Using C Lab	0	0	3	1.5
		Total Credits				**19.5**

I B.Tech – II SEMESTER

Sl. No	Course Components	Subjects	L	T	P	Credits
1	BSC	Mathematics-III (Vector Calculus, Transforms and PDE)	3	0	0	3
2	BSC	Applied Physics	3	0	0	3
3	ESC	Data Structures Through C	3	0	0	3
4	ESC	Electrical Circuit Analysis-I	3	0	0	3
5	ESC	Basic Civil and Mechanical Engineering	3	0	0	3
6	BSC	Applied Physics Lab	0	0	3	1.5
7	ESC	Basic Civil and Mechanical Engineering Lab	0	0	3	1.5
8	ESC	Data Structures through C Lab	0	0	3	1.5
9	Mandatory Course	Constitution of India	2	0	0	0
		Total Credits				**19.5**

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II B.Tech – I Semester

Sl. No	Course Components	Subjects	L	T	P	Credits
1	BSC	Mathematics– IV	3	0	0	3
2	PCC	Electronic Devices and Circuits	3	0	0	3
3	PCC	Electrical Circuit Analysis –II	3	0	0	3
4	PCC	DC Machines and Transformers	3	0	0	3
5	PCC	Electro Magnetic Fields	3	0	0	3
6	PCC	Electrical Circuits Lab	0	0	3	1.5
7	PCC	DC Machines and Transformers Lab	0	0	3	1.5
8	PCC	Electronic Devices and Circuits lab	0	0	3	1.5
9	SC	Skill oriented course - Design of Electrical Circuits using Engineering Software Tools	0	0	4	2
10	MC	Professional Ethics & Human Values	2	0	0	0
		Total Credits	**21.5**			

II B.Tech – II Semester

Sl. No	Course Components	Subjects	L	T	P	Credits
1	ESC	Python Programming	3	0	0	3
2	PCC	Digital Electronics	3	0	0	3
3	PCC	Power System-I	3	0	0	3
4	PCC	Induction and Synchronous Machines	3	0	0	3
5	HSMC	Managerial Economics & Financial Analysis	3	0	0	3
6	ESC	Python Programming Lab	0	0	3	1.5
7	PCC	Induction and Synchronous Machines Lab	0	0	3	1.5
8	PCC	Digital Electronics Lab	0	0	3	1.5
9	SC	Skill oriented course- IoT Applications of Electrical Engineering Lab	0	0	4	2
		Total Credits	**21.5**			
		Minors Course*	4	0	0	4
		Honors Course*	4	0	0	4

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III B.Tech – I Semester

Sl. No	Course Components	Subjects	L	T	P	Credits
1	PCC	Power Systems-II	3	0	0	3
2	PCC	Power Electronics	3	0	0	3
3	PCC	Control Systems	3	0	0	3
4	OEC	Open Elective- I/ Job Oriented Elective-I	3	0	0	3
5	PEC	Professional Elective - I	3	0	0	3
6	PCC	Control Systems Lab	0	0	3	1.5
7	PCC	Power Electronics Lab	0	0	3	1.5
8	SC	Soft Skill Course:Employability Skills	2	0	0	2
9	MC	Environmental Science	2	0	0	0
10	PROJ	Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester)	0	0	0	1.5
		TotalCredits	**21.5**			
		Minors Course*	4	0	0	4
		Honors Course*	4	0	0	4

III B.Tech – II Semester

Sl. No	Course Components	Subjects	L	T	P	Credits
1	PCC	Microprocessors and Microcontrollers	3	0	0	3
2	PCC	Electrical Measurements and Instrumentation	3	0	0	3
3	PCC	Power System Analysis	3	0	0	3
4	PEC	Professional Elective - II	3	0	0	3
5	OEC	Open Elective –II/ Job Oriented Elective-II	3	0	0	3
6	PCC	Electrical Measurements and Instrumentation Lab	0	0	3	1.5
7	PCC	Microprocessors and Microcontrollers Lab	0	0	3	1.5
8	PCC	Power Systems and Simulation Lab	0	0	3	1.5
9	SC	**Skill Advanced Course:** Machine Learning with Python	2	0	0	2
10	MC	Research Methodology	2	0	0	0
		Total Credits	**21.5**			
		Minors Course*	4	0	0	4
		Honors Course*	4	0	0	4

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IV B.Tech – I Semester

Sl. No	Course Components	Subjects	L	T	P	Credits
1	PEC	Professional Elective – III	3	0	0	3
2	PEC	Professional Elective – IV	3	0	0	3
3	PEC	Professional Elective – V	3	0	0	3
4	OEC	Open Elective- III/Job Oriented Elective-III	3	0	0	3
5	OEC	Open Elective-IV /Job Oriented Elective-IV	3	0	0	3
6	HSMC	Universal Human Values-2: Understanding Harmony	3	0	0	3
7	SC	**Skill Advanced Course** Machine Learning with PythonLab	0	0	4	2
8	PROJ	Industrial / Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII Semester)	0	0	3	3
		Total Credits	**23**			
		Minors Course*	4	0	0	4
		Honors Course*	4	0	0	4

IVB.TechIISemester

Sl. No	Course Components	Subjects	L	T	P	Credits
1	Major Project	Project work, seminar and internship in industry (6 Months)	--	--	--	12
		Total Credits	**12**			

HSMC:Humanities and Social Science Including Management Courses
BSC :Basic Science Courses
ESC:Engineering Science Courses
PCC:Professional Core Courses

PEC : Professional Elective Courses
OEC : Open Elective Courses
PROJ : Internship, Seminar, Project Wok
MC : Mandatory Courses
SC : Skill Oriented Courses

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Professional Elective Subjects offered to EEE Branch Students:

Professional Elective – I:

1. Linear IC Applications
2. Utilization of Electrical Energy
3. Computer Architecture and Organization
4. Optimization Techniques
5. Object Oriented Programming through Java

Professional Elective – II:

1. Signal and Systems
2. Electric Drives
3. Advanced Control Systems
4. Switchgear and Protection
5. Big Data Analytics

Professional Elective –III:

1. Digital Signal Processing
2. Renewable and Distributed Energy Technologies
3. Flexible Alternating Current Transmission Systems
4. Power Systems Deregulation
5. Data Base Management Systems

Professional Elective – IV:

1. Hybrid Electric Vehicles
2. High Voltage Engineering
3. Programmable Logic Controllers and Applications
4. Cloud Computing with AWS
5. Deep Learning Techniques

Professional Elective – V:

1. Power System Operation and Control
2. Switched Mode Power Conversion
3. AI Applications toElectrical Engineering
4. Data Science
5. MEAN Stack Technologies

Open Electives offered by EEE Department for Other Branches (Except EEE Branch)

Open Elective-I:

1. Renewable Energy Sources
2. Concepts of Optimization Techniques
3. Concepts of Control Systems

Open Elective-II:

1. Battery Management Systems and Charging Stations
2. Fundamentals of utilization of Electrical Energy
3. Indian Electricity Act

Open Elective-III:

1. Concepts of Microprocessors and Microcontrollers
2. Fundamentals of Electric Vehicles
3. Concepts of Internet of Things

Open Elective-IV:

1. Concepts of Power System Engineering
2. Concepts of Smart Grid Technologies

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***For Honor's/ Minor Course Fullfillments:**

- The 20 additional Credits need to be acquired, 16/15 credits can be earned by undergoing specified courses listed as pools, with 4/5 courses, each carrying 4/3 credits. The remaining 4/5 credits must be acquired through two online MOOCs (Swayam /NPTEL), which shall be domain specific, with 2/3 credits and with a minimum duration of 8/12weeks as recommended by the Board of Studies.
- Minor Engineering subjects are offered to other branches by EEE Department (except for EEE Students).
- Honors Engineering subjects are offered to EEE Students.
- The head of the department will float the list of allowed MOOC electives in each academic year, based on the list floated by MOOCs (Swayam/NPTEL).

*Honors Engineering Courses offered EEE Branch students

II B.Tech II Semester:

1. Communication Systems
2. Electrical Wiring, Estimation and Costing
3. Electrical Distribution Systems

III B.Tech I Semester:

1. Advanced Computer Networks
2. Power Quality
3. Special Electrical Machines

III B.Tech II Semester:

1. Digital Control Systems
2. Analysis of Power Electronic Converters
3. HVDC Transmission

IV B.Tech I Semester:

1. EHV AC Transmission
2. Smart Grid Technologies
3. Power Electronic Control of Electrical Drives

*Minor Engineering Courses offered by EEE Department for Other Branches (Except EEE Branch)

II B.Tech II Semester:

1. Fundamentals of Electrical Circuits
2. Concepts of Electrical Measurements

III B.Tech I Semester:

1. Analysis of Linear Systems
2. Energy Auditing, Conservation and Management

III B.Tech II Semester:

1. Evolutionary Algorithms
2. Fundamentals of Power Electronics

IV B.Tech I Semester:

1. Neural Networks and Fuzzy Logic
2. Concepts of Electric Drives and Its Applications

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE STRUCTURE AND SYLLABUS

For UG – R20

B. TECH - ELECTRONICS AND COMMUNICATION ENGINEERING

(Applicable for batches admitted from 2020-2021)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA - 533 003, ANDHRA PRADESH, INDIA

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE STRUCTURE

I Year –I SEMESTER

S. No.	Category	Subjects	L	T	P	Credits
1	HS	Communicative English	3	0	0	3
2	BS	Mathematics –I(Calculus)	3	0	0	3
3	BS	Applied Chemistry	3	0	0	3
4	ES	Programming for Problem Solving Using C	3	0	0	3
5	BS	Engineering Drawing	2	0	2	3
6	LC	English Communication Skills Laboratory	0	0	3	1.5
7	LC	Applied Chemistry Lab	0	0	3	1.5
8	LC	Programming for Problem Solving Using C Lab	0	0	3	1.5
					Total Credits	**19.5**

I Year – II SEMESTER

S. No	Category	Subjects	L	T	P	Credits
1	BS	Mathematics –II (Linear Algebra and Numerical Methods)	3	0	0	3
2	BS	Applied Physics	3	0	0	3
3	ES	Object Oriented Programming through Java	2	0	2	3
4	ES	Network Analysis	3	0	0	3
5	ES	Basic Electrical Engineering	3	0	0	3
6	LC	Electronic workshop Lab	0	0	3	1.5
7	LC	Basic Electrical Engineering Lab	0	0	3	1.5
8	LC	Applied Physics Lab	0	0	3	1.5
9	MC	Environmental Science	3	0	0	0.0
					Total Credits	**19.5**

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II Year –I Semester

S. No	Category	Name of the Subject	L	T	P	Credits
1	PC	Electronic Devices and Circuits	3	1	0	3
2	PC	Switching Theory and Logic Design	3	1	0	3
3	PC	Signals and Systems	3	1	0	3
4	BS	Mathematics-III (Transforms and Vector Calculus)	3	1	0	3
5	BS	Random Variables and Stochastic Processes	3	1	0	3
6	LC	OOPS through Java Lab	0	0	2	1.5
7	LC	Electronic Devices and Circuits -Lab	0	0	2	1.5
8	LC	Switching Theory and Logic Design–Lab	0	0	2	1.5
9	SC	Python Programming	0	0	4	2
					Total Credits	**21.5**

II Year – II Semester

S. No	Category	Name of the subject	L	T	P	Credits
1	PC	Electronic Circuit Analysis	3	1	0	3
2	PC	Digital IC Design	3	1	0	3
3	PC	Analog Communications	3	0	0	3
4	ES	Linear control Systems	3	1	0	3
5	HS	Management and Organizational Behavior	3	0	0	3
6	LC	Electronic Circuit Analysis Lab	0	0	3	1.5
7	LC	Analog Communications Lab	0	0	3	1.5
8	LC	Digital IC Design Lab	0	0	3	1.5
9	SC	Soft Skills	0	0	4	2
10	MC	Constitution of India	3	0	0	0
					Total Credits	**21.5**
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)						**4**

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III Year - I Semester

S. No	Category	Name of the subject	L	T	P	Credits
1	PC	Analog ICs and Applications	3	0	0	3
2	PC	Electromagnetic Waves and Transmission Lines	3	0	0	3
3	PC	Digital Communications	3	0	0	3
4	OE1	Open Elective Course/Job oriented elective-1	2	0	2	3
5	PE1	Professional Elective courses -1	3	0	0	3
6	LC	Analog ICs and Applications LAB	0	0	3	1.5
7	LC	Digital Communications Lab	0	0	3	1.5
8	SC	Data Structures using Java Lab	0	0	4	2
9	MC	Indian Traditional Knowledge	2	0	0	0
	Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester		0	0	0	1.5
		Total credits				**21.5**
	Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)					**4**

PE1:	**OE1:**
1. Antenna and Wave Propagation 2.Electronic Measurements and Instrumentation 3.Computer Architecture & Organization	Candidate should select the subject from list of subjects offered by other departments

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III Year –II Semester

S. No	Category	Name of the subject	L	T	P	Credits
1	PC	Microprocessor and Microcontrollers	3	1	0	3
2	PC	VLSI Design	3	0	0	3
3	PC	Digital Signal Processing	3	0	0	3
4	PE2	Professional Elective courses - 2	3	0	0	3
5	OE 2	Open Elective Course/Job oriented elective -2	2	0	2	3
6	LC	Microprocessor and Microcontrollers - Lab	0	0	3	1.5
7	LC	VLSI Design Lab	0	0	3	1.5
8	LC	Digital Signal Processing Lab	0	0	3	1.5
9	SC	ARM based/ Aurdino based Programming	1	0	2	2
10	MC	Research Methodology	2	0	0	0
					Total credits	**21.5**
	Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)					**4**

Industrial/Research Internship (Mandatory) 2 Months during summer vacation

PE2:	**OE2:**
1. Microwave Engineering 2. Mobile & Cellular Communication 3. Embedded Systems 4. CMOS Analog IC Design	Candidate should select the subject from list of subjects offered by other departments

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IV Year –I Semester

S. No	Category	Name of the subject	L	T	P	Credits
1	PE	Professional Elective courses -3	3	0	0	3
2	PE	Professional Elective courses -4	3	0	0	3
3	PE	Professional Elective courses -5	3	0	0	3
4	OE	Open Elective Courses/ Job oriented elective -3	2	0	2	3
5	OE	Open Elective Courses/ Job oriented elective -4	2	0	2	3
6	HS	***Humanities and Social Science Elective**	3	0	0	3
7	SC	**Designer tools (HFSS,** Microwave Studio CST. Cadence Virtuoso. Synopsys, Mentor Graphics, Xilinx.)	1	0	2	2
Industrial/Research Internship 2 Months (Mandatory) afterthird year (to be evaluated during VII semester			0	0	0	3
		Total credits				**23**
	Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)					**4**

PE 3:	PE5:
1. Optical Communication 2. Digital Image Processing 3. Low Power VLSI Design	1. Radar engineering 2.Pattern recognition & Machine Learning 3.Internet of Things
PE4: 1.Satellite Communications 2.Soft Computing Techniques 3.Digital IC Design using CMOS	

IV Year – II Semester

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

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE STRUCTURE AND SYLLABUS

For UG –R20

B. TECH - COMPUTER SCIENCE & ENGINEERING

(Applicable for batches admitted from 2020-2021)

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE STRUCTURE

I Year – I SEMESTER						
S. No	**Course Code**	**Courses**	**L**	**T**	**P**	**Credits**
1	HS	Communicative English	3	0	0	3
2	BS	Mathematics - I (Calculus And Differential Equations)	3	0	0	3
3	BS	Applied Physics	3	0	0	3
4	ES	Programming for Problem Solving using C	3	0	0	3
5	ES	Computer Engineering Workshop	1	0	4	3
6	HS	English Communication Skills Laboratory	0	0	3	1.5
7	BS	Applied Physics Lab	0	0	3	1.5
8	ES	Programming for Problem Solving using C Lab	0	0	3	1.5
Total Credits			**19.5**			

I Year – II SEMESTER						
S. No	**Course Code**	**Courses**	**L**	**T**	**P**	**Credits**
1	BS	Mathematics – II (Linear Algebra And Numerical Methods)	3	0	0	3
2	BS	Applied Chemistry	3	0	0	3
3	ES	Computer Organization	3	0	0	3
4	ES	Python Programming	3	0	0	3
5	ES	Data Structures	3	0	0	3
6	BS	Applied Chemistry Lab	0	0	3	1.5
7	ES	Python Programming Lab	0	0	3	1.5
8	ES	Data Structures Lab	0	0	3	1.5
9	MC	Environment Science	2	0	0	0
Total Credits			**19.5**			

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

II Year – I SEMESTER						
S. No	**Course Code**	**Courses**	**L**	**T**	**P**	**Credits**
1	BS	Mathematics III	3	0	0	3
2	CS	Object Oriented Programming through C++	3	0	0	3
3	CS	Operating Systems	3	0	0	3
4	CS	Software Engineering	3	0	0	3
5	CS	Mathematical Foundations of Computer Science	3	0	0	3
6	CS	Object Oriented Programming through C++ Lab	0	0	3	1.5
7	CS	Operating Systems Lab	0	0	3	1.5
8	CS	Software Engineering Lab	0	0	3	1.5
9	SO	**Skill oriented Course - I** Applications of Python-NumPy **OR** 2) Web Application Development Using Full Stack -Frontend Development – Module-I	0	0	4	2
10	MC	Constitution of India	2	0	0	0
Total Credits			**21.5**			

II Year – II SEMESTER						
S. No	**Course Code**	**Courses**	**L**	**T**	**P**	**Credits**
1	BS	Probability and Statistics	3	0	0	3
2	CS	Database Management Systems	3	0	0	3
3	CS	Formal Languages and Automata Theory	3	0	0	3
4	ES	Java Programming	3	0	0	3
5	HS	Managerial Economics and Financial Accountancy	3	0	0	3
6	CS	Database Management Systems Lab	0	0	2	1
7	CS	R Programming Lab	0	1	2	2
8	ES	Java Programming Lab	0	0	3	1.5
9	SO	**Skill Oriented Course - II** Applications of Python-Pandas **OR** 2) Web Application Development Using Full Stack -Frontend Development –Module-II	0	0	4	2
Total Credits			**21.5**			
10	Minor	Operating Systems[$]	3	0	2	3+1
11	Honors	Any course from the Pool, as per the opted track	4	0	0	4

$- Integrated Course

III B. Tech – I Semester						
S.No	**Course Code**	**Courses**	**Hours per week**			**Credits**
			L	**T**	**P**	**C**
1	PC	Computer Networks	**3**	**0**	**0**	**3**
2	PC	Design and Analysis of Algorithms	**3**	**0**	**0**	**3**
3	PC	Data Warehousing and Data Mining	**3**	**0**	**0**	**3**
4	Open Elective / Job Oriented	**Open Elective-I** Open Electives offered by other departments/ Optimization in Operations Research (Job oriented course)	**3**	**0**	**0**	**3**
5	PE	**Professional Elective-I** Artificial Intelligence Software Project Management Distributed Systems Advanced Unix Programming	**3**	**0**	**0**	**3**
6	PC	Data Warehousing and Data Mining Lab	**0**	**0**	**3**	**1.5**
7	PC	Computer Networks Lab	**0**	**0**	**3**	**1.5**
8	SO	**Skill Oriented Course – III** 1. Animation course: Animation Design **OR** 2.Continuous Integration and Continuous Delivery using DevOps	**0**	**0**	**4**	**2**
9	MC	Employability Skills-I	**2**	**0**	**0**	**0**
10	PR	**Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester**	**0**	**0**	**0**	**1.5**
Total credits						**21.5**
11	Minor	Database Management Systems$	3	0	2	3+1
12	Honors	Any course from the Pool, as per the opted track	4	0	0	4

$- Integrated Course

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

III B. Tech – II Semester						
S.No	**Course Code**	**Courses**	**Hours per week**			**Credits**
			L	**T**	**P**	**C**
1	PC	Machine Learning	**3**	**0**	**0**	**3**
2	PC	Compiler Design	**3**	**0**	**0**	**3**
3	PC	Cryptography and Network Security	**3**	**0**	**0**	**3**
4	PE	**Professional Elective-II** 1.Mobile Computing 2.Big Data Analytics 3.Object Oriented Analysis and Design 4.Network Programming	**3**	**0**	**0**	**3**
5	Open Elective /Job Oriented	**Open Elective-II** Open Electives offered by other departments/ MEAN Stack Development *(Job Oriented)*	**3**	**0**	**0**	**3**
6	PC	Machine Learning using Python Lab	**0**	**0**	**3**	**1.5**
7	PC	Compiler Design Lab	**0**	**0**	**3**	**1.5**
8	PC	Cryptography and Network Security Lab	**0**	**0**	**3**	**1.5**
9	SO	**Skill Oriented Course - IV** 1.Big Data**:**Spark **OR** 2.MEAN Stack Technologies-Module I (HTML 5, JavaScript, Node.js, Express.js and TypeScript)	**0**	**0**	**4**	**2**
10	MC	Employability skills-II	**2**	**0**	**0**	**0**
Total credits						**21.5**
Industrial/Research Internship(Mandatory) 2 Months during summer vacation						
11	Minor	Data Structures and Algorithms[$]	3	0	2	3+1
12	Honors	Any course from the Pool, as per the opted track	4	0	0	4
Minor course through SWAYAM			**-**	**-**	**-**	**2**

$- Integrated Course

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

IV B. Tech –I Semester						
S.No	**Course Code**	**Course Title**	**Hoursperweek**			**Credits**
			L	**T**	**P**	**C**
1	PE	**Professional Elective-III** 1.Cloud Computing 2.Neural Networks and Soft Computing 3.Ad-hoc and Sensor Networks 4.Cyber Security & Forensics	**3**	**0**	**0**	**3**
2	PE	**Professional Elective-IV** 1. Deep Learning Techniques 2. Social Networks & Semantic Web 3. Computer Vision 4.MOOCS-NPTEL/SWAYAM%	**3**	**0**	**0**	**3**
3	PE	**Professional Elective-V** 1.Block-Chain Technologies 2.Wireless Network Security 3.Ethical Hacking 4.MOOCS-NPTEL/SWAYAM%	**3**	**0**	**0**	**3**
4	Open Elective /Job Oriented	**Open Elective-III** Open Electives offered by other departments/ API and Microservices (Job Oriented Course)	**3**	**0**	**0**	**3**
5	Open Elective /Job Oriented	**Open Elective-IV** 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.PYTHON: Deep Learning **OR** 2.MEAN Stack Technologies-Module II-Angular JS and MongoDB **OR** 3.APSSDC offered Courses	**0**	**0**	**4**	**2**
8	PR	**Industrial/Research Internship 2 months (Mandatory) after third year (to be evaluated during VII semester**	**0**	**0**	**0**	**3**
Total credits						**23**
11	Minor	Software Engineering$ / any other from PART-B (For Minor)	3	0	2	3+1
12	Honors	Any course from the Pool, as per the opted track	4	0	0	4
Minor course through SWAYAM			**-**	**-**	**-**	**2**

$- Integrated Course
% - MOOC Course

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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

Note:

1. ***For integrated courses***: Theory and laboratory exams will be conducted separately, and the student concern will get credits if successfully completes both theory and laboratory. Only external exam will be conducted for Laboratory component. Credit based weightage shall be considered while awarding the grade.
2. ***For MOOC courses***: Based on the students interest, student can register and complete a 12 week course one year in advance, by prior information to the concern.

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

DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE STRUCTURE AND SYLLABUS

For UG – R20

B. TECH - INFORMATION TECHNOLOGY

(Applicable for batches admitted from 2020-2021)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA - 533 003, Andhra Pradesh, India

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

DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE STRUCTURE

I Year – I SEMESTER						
S. No	**Course Code**	**Courses**	**L**	**T**	**P**	**Credits**
1	HS	Communicative English	3	0	0	3
2	BS	Mathematics - I (Calculus And Differential Equations)	3	0	0	3
3	BS	Applied Physics	3	0	0	3
4	ES	Programming for Problem Solving using C	3	0	0	3
5	ES	Computer Engineering Workshop	1	0	4	3
6	HS	English Communication Skills Laboratory	0	0	3	1.5
7	BS	Applied Physics Lab	0	0	3	1.5
8	ES	Programming for Problem Solving using C Lab	0	0	3	1.5
Total Credits			**19.5**			

I Year – II SEMESTER						
S. No	**Course Code**	**Courses**	**L**	**T**	**P**	**Credits**
1	BS	Mathematics – II (Linear Algebra And Numerical Methods)	3	0	0	3
2	BS	Applied Chemistry	3	0	0	3
3	ES	Computer Organization	3	0	0	3
4	ES	Python Programming	3	0	0	3
5	ES	Data Structures	3	0	0	3
6	BS	Applied Chemistry Lab	0	0	3	1.5
7	ES	Python Programming Lab	0	0	3	1.5
8	ES	Data Structures Lab	0	0	3	1.5
9	MC	Environment Science	2	0	0	0
Total Credits			**19.5**			

II Year – I SEMESTER						
S.No	**Course Code**	**Courses**	**L**	**T**	**P**	**Credits**
1	BS	Mathematics III	3	0	0	3
2	IT	Object Oriented Programming through C++	3	0	0	3
3	IT	Operating Systems	3	0	0	3
4	IT	Database Management Systems	3	0	0	3
5	IT	Discrete Mathematics and Graph Theory	3	0	0	3
6	IT	Object Oriented Programming through C++ Lab	0	0	3	1.5
7	IT	Operating Systems Lab	0	0	3	1.5
8	IT	Database Management Systems Lab	0	0	3	1.5
9	SO	**Skill Oriented Course I** 1) Animations- 2D Animation 2) Distributed Technologies- NoSQL	0	0	4	2
10	MC	Constitution of India	2	0	0	0
Total Credits			**21.5**			

II Year – II SEMESTER						
S.No	**Course Code**	**Courses**	**L**	**T**	**P**	**Credits**
1	BS	Statistics with R	2	0	2	3
2	IT	Principles of Software Engineering	3	0	0	3
3	IT	Automata Theory and Compiler Design	3	0	0	3
4	ES	Java Programming	3	0	0	3
5	HS	Managerial Economics and Financial Accountancy	3	0	0	3
6	IT	UML Lab	0	1	2	2
7	IT	FOSS Lab	0	0	2	1
8	ES	Java Programming Lab	0	0	3	1.5
9	SO	**Skill Oriented Course II** 1) Animations- 3D Animation **OR** 2) Distributed Technologies- MongoDB	0	0	4	2
Total Credits			**21.5**			
10	Minor	Object Oriented Programming through C++[$]	3	0	2	3+1
11	Honors	Any course from the Pool, as per the opted track	4	0	0	4

$- Integrated Course

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

DEPARTMENT OF INFORMATION TECHNOLOGY

III B. Tech – I Semester						
S.No	**Course Code**	**Courses**	**Hours per week**			**Credits**
			L	**T**	**P**	**C**
1	PC	Computer Networks	**3**	**0**	**0**	**3**
2	PC	Design and Analysis of Algorithms	**3**	**0**	**0**	**3**
3	PC	Data Mining Techniques	**3**	**0**	**0**	**3**
4	Open Elective/Job Oriented	**Open Elective-I** Open Electives offered by other departments/ DevOps (Job Oriented course)	**3**	**0**	**0**	**3**
5	PE	**Professional Elective-I** 1. Artificial Intelligence 2. Agile Software Process 3. Distributed Systems 4. Advanced Unix Programming	**3**	**0**	**0**	**3**
6	PC	Data Mining Techniques with R Lab	**0**	**0**	**3**	**1.5**
7	PC	Computer Networks Lab	**0**	**0**	**3**	**1.5**
8	SO	**Skill Oriented Course - III** 1.Animation course: Animation Design **OR** 2. Continuous Integration and Continuous Delivery using DevOps	**0**	**0**	**4**	**2**
9	MC	Employability Skills-I	**2**	**0**	**0**	**0**
10	PR	**Summer Internship 2 Months(Mandatory) after second year(to be evaluated during V semester**	**0**	**0**	**0**	**1.5**
Total credits						**21.5**
11	Minor	Computer Networks[$]	3	0	2	3+1
12	Honors	Any course from the Pool, as per the opted track	4	0	0	4

$- Integrated Course

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

DEPARTMENT OF INFORMATION TECHNOLOGY

III B. Tech – II Semester						
S.No	**Course Code**	**Courses**	**Hours per week**			**Credits**
			L	**T**	**P**	**C**
1	PC	Machine Learning	**3**	**0**	**0**	**3**
2	PC	Big Data Analytics	**3**	**0**	**0**	**3**
3	PC	Cryptography and Network Security	**3**	**0**	**0**	**3**
4	PE	**Professional Elective-II** 1.Mobile Computing 2.MEAN Stack Development 3. Design Patterns 4.Scripting Languages	**3**	**0**	**0**	**3**
5	Open Elective/ Job Oriented	**Open Elective-II** Open Electives offered by other departments	**3**	**0**	**0**	**3**
6	PC	Big Data Analytics lab	**0**	**0**	**3**	**1.5**
7	PC	Machine Learning using Python Lab	**0**	**0**	**3**	**1.5**
8	PC	Cryptography and Network Security Lab	**0**	**0**	**3**	**1.5**
9	SO	**Skill Oriented Course - IV** 1.Data Science: Natural Language Processing **OR** 2.Video Analytics	**0**	**0**	**4**	**2**
10	MC3201	Employability skills-II	**2**	**0**	**0**	**0**
Total credits						**21.5**
Industrial/Research Internship(Mandatory) 2 Months during summer vacation						
11	Minor	Data Structures and Algorithms$^{\$}$	3	0	2	3+1
12	Honors	Any course from the Pool, as per the opted track	4	0	0	4
Minor course through SWAYAM			**-**	**-**	**-**	**2**

$- Integrated Course

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

DEPARTMENT OF INFORMATION TECHNOLOGY

IV B. Tech –I Semester						
S.No	**Course Code**	**Course Title**	**Hours per week**			**Credits**
			L	**T**	**P**	**C**
1	PE	**Professional Elective-III** 1.Cloud Computing 2. Artificial Neural Networks 3. Internet of Things (IoT) 4.Cyber Security & Forensics	**3**	**0**	**0**	**3**
2	PE	**Professional Elective-IV** 1. Deep Learning Techniques 2. Social Networks Analysis 3. Advanced Databases 4.MOOCS-NPTEL/SWAYAM	**3**	**0**	**0**	**3**
3	PE	**Professional Elective-V** 1.Block-Chain Technologies 2.M-Commerce 3.Ethical Hacking 4.MOOCS-NPTEL/SWAYAM	**3**	**0**	**0**	**3**
4	Open Elective /Job Oriented	**Open Elective-III** Open Electives offered by other departments	**2**	**0**	**2**	**3**
5	Open Elective /Job Oriented	**Open Elective-IV** Open Electives offered by other departments	**2**	**0**	**2**	**3**
6	HS	Universal Human Values 2: Understanding Harmony	**3**	**0**	**0**	**3**
7	SO	PYTHON: Deep Learning **OR** Secure Coding Techniques **OR** APSSDC offered Courses	**0**	**0**	**4**	**2**
8	PR	**Industrial/Research Internship 2 months (Mandatory) after third year (to be evaluated during VII semester**	**0**	**0**	**0**	**3**
					Total credits	**23**
11	Minor	Software Engineering$ / any other from PART-B (For Minor)	3	0	2	3+1
12	Honors	Any course from the Pool, as per the opted track	4	0	0	4
		Minor course through SWAYAM	**-**	**-**	**-**	**2**

$- Integrated Course

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

Note:

1. ***For integrated courses***: Theory and laboratory exams will be conducted separately, and the student concern will get credits if successfully completes both theory and laboratory. Only external exam will be conducted for Laboratory component. Credit based weightage shall be considered while awarding the grade.
2. ***For MOOC courses***: Based on the students interest, student can register and complete a 12 week course one year in advance, by prior information to the concern.

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

DEPARTMENT OF INFORMATION TECHNOLOGY

SUGGESTED COURSES FOR HONORS PROGRAM

POOL1- AI & ML	**POOL2- Systems Engineering**
1. Mathematics for Machine Learning 2. Text Mining and Time Series Analysis 3. Natural Language Processing 4. Reinforcement Learning	1. Internet of Things 2. Data Communications and Information Coding Theory 3. Service Oriented Architectures 4. Design of Secure Protocols 5. Network Coding
POOL3- Information Security	**POOL4 – Data Science**
1. Principles of Cyber Security 2. Computational Number Theory 3. Cryptanalysis 4. Elliptic Curve Cryptography 5. Introduction to Quantum Computing and Quantum Cryptography 6. Public Key Infrastructure and Trust Management 7. Information Security Analysis and Audit 8. Cloud and IoT Security 9. Web Security 10. Block Chain Architecture Design and Use Cases	1. Data Visualization 2. Statistical Foundations for Data Science 3. Mining Massive Data Sets 4. Medical Image Data Processing

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

DEPARTMENT OF CSE - ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

COURSE STRUCTURE AND SYLLABUS

For UG – R20

B. Tech - COMPUTER SCIENCE AND ENGINEERING with Specialization

Common to

(i) CSE (ARTIFICIAL INTELLIGENCE and MACHINE LEARNING)-Branch Code:42

(ii) ARTIFICIAL INTELLIGENCE and MACHINE LEARNING - Branch Code: 61

(Applicable for batches admitted from 2020-2021)

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

DEPARTMENT OF CSE - ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

COURSE STRUCTURE

I Year – I SEMESTER						
S. No	**Course Code**	**Courses**	**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	Computer Engineering Workshop	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
Total Credits						**19.5**

I Year – II SEMESTER						
S. No	**Course Code**	**Courses**	**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
Total Credits						**19.5**

*Internal Evaluation

DEPARTMENT OF CSE - ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

II Year – I SEMESTER						
S. No	**Course Code**	**Courses**	**L**	**T**	**P**	**Credits**
1	BS	Mathematics III	3	0	0	3
2	CS	Mathematical Foundations of Computer Science	3	0	0	3
3	CS	Introduction to Artificial Intelligence and Machine Learning	3	0	0	3
4	CS	Object Oriented Programming with Java	3	0	0	3
5	CS	Database Management Systems	3	0	0	3
6	CS	Introduction to Artificial Intelligence and Machine Learning Lab	0	0	3	1.5
7	CS	Object Oriented Programming with Java Lab	0	0	3	1.5
8	CS	Database Management Systems Lab	0	0	3	1.5
9	SO	Mobile App Development	0	0	4	2
10	MC	Essence of Indian Traditional Knowledge	2	0	0	0
Total Credits						**21.5**

II Year – II SEMESTER						
S. No	**Course Code**	**Courses**	**L**	**T**	**P**	**Credits**
1	BS	Probability and Statistics	3	0	0	3
2	CS	Computer Organization	3	0	0	3
3	CS	Data Warehousing and Mining	3	0	0	3
4	ES	Formal Languages and Automata Theory	3	0	0	3
5	HS	Managerial Economics and Financial Accountancy	3	0	0	3
6	CS	R Programming Lab	0	0	3	1.5
7	CS	Data Mining using Python Lab	0	0	3	1.5
8	ES	Web Application Development Lab	0	0	3	1.5
9	SO	Natural Language Processing with Python	0	0	4	2
Total Credits						**21.5**
10	Minor	Introduction to Artificial Intelligence and Machine Learning $^{\$}$	3	0	2	**4**

$- Integrated Course

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

DEPARTMENT OF CSE - ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

III B. Tech – I Semester						
S.No	**Course Code**	**Courses**	**Hours per week**			**Credits**
			L	**T**	**P**	**C**
1	PC	Compiler Design	3	0	0	3
2	PC	Operating Systems	3	0	0	3
3	PC	Machine Learning	3	0	0	3
4	Open Elective/Job Oriented	**Open Elective-I** Open Electives offered by other departments/ Optimization in Operations Research(Job oriented course)	3	0	0	3
5	PE	**Professional Elective-I** 1. Software Engineering 2. Computer Vision 3. Data Visualization 4. DevOps 5. Machine Learning for Engineering and Science Applications (NPTEL) (https://nptel.ac.in/courses/106106198)	3	0	0	3
6	PC	Operating Systems & Compiler Design Lab	0	0	3	1.5
7	PC	Machine Learning Lab	0	0	3	1.5
8	SO	**Skill Oriented Course - III** Continuous Integration and Continuous Delivery using DevOps	0	0	4	2
9	MC	Employability Skills-I	2	0	0	0
10	PR	**Summer Internship 2 Months (Mandatory) after second year(to be evaluated during V semester**	0	0	0	1.5
Total credits						**21.5**
11	Minor	Machine Learning$^{\$}$	3	0	2	**4**

$- Integrated Course

DEPARTMENT OF CSE - ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

III B. Tech – II Semester						
S.No	**Course Code**	**Courses**	**Hours per week**			**Credits**
			L	**T**	**P**	**C**
1	PC	Computer Networks	3	0	0	3
2	PC	Deep Learning	3	0	0	3
3	PC	Design and Analysis of Algorithms	3	0	0	3
4	PE	**Professional Elective-II** 1. Software Project Management 2. Distributed Systems 3. Internet of Things 4. Network Programming	3	0	0	3
5	Open Elective/Job Oriented	**Open Elective-II** 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	Algorithms for Efficient Coding Lab	0	0	3	1.5
8	PC	Deep Learning with Tensorflow	0	0	3	1.5
9	SO	**Skill Oriented Course - IV** MEAN Stack Technologies-Module I-HTML 5, JavaScript, Node.js, Express.js and TypeScipt **OR** Big Data : Apache Spark	0	0	4	2
10	MC	Employability skills-II	2	0	0	0
Total credits						**21.5**
Industrial/Research Internship(Mandatory) 2 Months during summer vacation						
11	Minor	Deep Learning$	3	0	2	**4**
Minor courses through SWAYAM			0	0	0	**2**

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

DEPARTMENT OF CSE - ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

IV B. Tech –I Semester (Tentative)						
S.No	**Course Code**	**Course Title**	**Hours per week**			**Credits**
			L	**T**	**P**	**C**
1	PE	**Professional Elective-III** 1.Reinforcement Learning 2.Soft Computing 3. Cryptography and Network Security 4. Block Chain Technologies 5. Speech Processing	3	0	0	3
2	PE	**Professional Elective-IV** 1. Robotic Process Automation 2. Cloud Computing 3. Big Data Analytics 4. NOSQL Databases 5. Video Analytics	3	0	0	3
3	PE	**Professional Elective-V** 1. Social Network Analysis 2. Recommender Systems 3. AI Chatbots 4. Object Oriented Analysis and Design 5. Semantic Web	3	0	0	3
4	Open Elective /Job Oriented	**Open Elective-III** Open Electives offered by other departments/API and Microservices (Job Oriented Course)	3	0	0	3
5	Open Elective /Job Oriented	**Open Elective-IV** 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.Machine Learning with Go (Infosys Spring Board) **OR** 2.MEAN Stack Technologies-Module II-Angular JS and MongoDB	0	0	4	2
8	PR	**Industrial/Research Internship 2 months (Mandatory) after third year (to be evaluated during VII semester**	0	0	0	3
Total credits						**23**
9	Minor	Reinforcement Learning	4	0	0	4
Minor courses through SWAYAM			0	0	0	2

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

SUGGESTED COURSES MINOR ENGINEERING IN B.TECH.CSE- AI

Eligibility for Minor in CSE-AI: -

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	Introduction to Artificial Intelligence and Machine Learning	4
2	Machine Learning	4
3	Deep Learning	4
4	Reinforcement Learning	4
5	MOOCS Courses ** 1. Introduction to Soft Computing(NPTEL) (https://nptel.ac.in/courses/106105173) 2. Digital Speech Processing (NPTEL) (https://nptel.ac.in/courses/117105145) 3. Cloud Computing (NPTEL) (https://nptel.ac.in/courses/106105167) 4. Practical Machine Learning with Tensorflow (NPTEL) (https://nptel.ac.in/courses/106106213)	4
	Total	**20**

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

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

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

COURSE STRUCTURE & SYLLABUS M.Tech ECE
VLSI & Embedded System, Embedded System &VLSI, VLSI Design & Embedded System, Embedded System & VLSI Design
Programmes

(Applicable for batches admitted from 2019-2020)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

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

I Semester

S.No	Course No	Course Name	P.Os	Category	L	T	P	Credits
1	PC	RTL Simulation and Synthesis with PLDs			3	0	0	3
2	PC	Microcontrollers and Programmable Digital Signal Processors			3	0	0	3
3	PE	1. Digital Signal and Image Processing 2. Parallel Processing 3. VLSI signal processing			3	0	0	3
4	PE	1. Programming Languages for Embedded Systems 2. System Design with Embedded Linux 3.CAD of Digital System			3	0	0	3
5		Research methodology and IPR			2	0	0	2
6	Lab 1	RTL Simulation and Synthesis with PLDs Lab			0	0	4	2
7	Lab 2	Microcontrollers and Programmable Digital Signal Processors Lab			0	0	4	2
8	Aud 1	Audit course-1			2	0	0	0
				Total				18

II Semester

S.No	Course No	Course Name	P.Os	Category	L	T	P	Credits
1	PC	Analog and Digital CMOS VLSI Design			3	0	0	3
2	PC	Real Time Operating Systems			3	0	0	3
3	PE	1. Memory Architectures 2. SoC Design 3.Low power VLSI Design			3	0	0	3
4	PE	1.Communication Buses and Interfaces 2.Network Security and Cryptography 3.Physical design automation			3	0	0	3
5	Lab 1	Analog and Digital CMOS VLSI Design Lab			0	0	4	2
6	Lab 2	Real Time Operating Systems Lab			0	0	4	2
7	MP	Mini Project			0	0	4	2
8	Aud 2	Audit Course – 2			2	0	0	0
				Total				18

*Students be encouraged to go to Industrial Training/Internship for at least 2-3 weeks during semester break.

III Semester*

S.No	Course No	Course Name	P.Os	Category	L	T	P	Credits
1	PE	1.IOT and its Applications 2.Hardware Software co-design 3.Artificial Intelligence			3	0	0	3
2	OE	1. Business Analytics 2. Industrial Safety 3. Operations Research 4. Cost Management of Engineering Projects 5. Composite Materials 6. Waste to Energy			3	0	0	3
3	Dissertation	Dissertation Phase -I /Industrial Project **(to be continued and evaluated next semester)**			0	0	20	10[#]
				Total				16

[#]Evaluated and Displayed in IV Semester Marks list.

*Students going for Industrial Project/Thesis will complete these courses through MOOCs

IV Semester

S.No	Course No	Course Name	P.Os	Category	L	T	P	Credits
1	Dissertation	Project/ Dissertation Phase-II **(continued from III semester)**			0	0	32	16
				Total				16

Audit Course 1& 2

1. English for Research Paper Writing
2. Disaster Management
3. Sanskrit for Technical Knowledge
4. Value Education
5. Constitution of India
6. Pedagogy Studies
7. Stress Management by Yoga
8. Personality Development through Life Enlightenment Skills

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE STRUCTURE & SYLLABUS M. Tech CSE for DATA SCIENCE PROGRAMME

(Applicable for batches admitted from 2019-2020)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

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I SEMESTER

S.No	Course Code	Courses	Category	L	T	P	C
1	MTDS1101	**Program Core-1** Data Predictive Analytics	PC	3	0	0	3
2	MTDS1102	**Program Core-2** Data Science Applications with Python	PC	3	0	0	3
3	MTDS1103	**Program Elective-1** 1. Advanced Graph Theory 2. Data Warehousing 3. Artificial Intelligence	PE	3	0	0	3
4	MTDS1104	**Program Elective-2** 1. Internet of Things 2. Social Network and Semantic Web 3. Big Data Analytics	PE	3	0	0	3
5	MTDS1105	**Research Methodology and IPR**	CC			0	2
6	MTDS1106	**Laboratory-1** Data Science Applications with Python Lab	LB	0	0	4	2
7	MTDS1107	**Laboartory-2** Advanced Computing with Python-1 Lab	LB	0	0	4	2
8	MTDS1108	**Audit Course-1***	AC	2	0	0	0
Total Credits							18

**Student has to choose any one audit course listed below.*

II SEMESTER

S.No	Course Code	Courses	Category	L	T	P	C
1	MTDS1201	**Program Core-3** Advance Algorithms	PC	3	0	0	3
2	MTDS1202	**Program Core-4** Machine Learning Techniques	PC	3	0	0	3
3	MTDS1203	**Program Elective-3** 1. Natural Language Processing 2. High Performance Computing 3. Cloud Computing	PE	3	0	0	3
4	MTDS1204	**Program Elective-4** 1. Principles of Deep Learning 2. Image and Video Analytics 3. Principles of Data Security	PE	3	0	0	3
5	MTDS1205	**Laboratory-3** Advance Algorithms Lab	LB	0	0	4	2
6	MTDS1206	**Laboartory-4** Advanced Computing with Python-2 Lab	LB	0	0	4	2
7	MTDS1207	**Mini Project with Seminar**	MP	2	0	0	2
8	MTDS1208	**Audit Course-2***	AC	2	0	0	0
Total Credits							18

**Student has to choose any one audit course listed below.*

Audit Course 1 & 2:

1. English for Research Paper Writing
2. Disaster Management
3. Sanskrit for Technical Knowledge
4. Value Education
5. Constitution of India
6. Pedagogy Studies
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III SEMESTER

S.No	Course Code	Courses	Category	L	T	P	C
1	MTDS2101	**Program Elective-5** 1. Multivariate Analysis 2. Next Generation Databases 3. MOOCs-1 through NPTEL/SWAYAM 12 Week Program related to the programme which is not listed in the course structure	PE	3	0	0	3
2	MTDS2102	**Open Elective** 1. MOOCs-2 through NPTEL/SWAYAM - Any 12 week course on Engineering/ Management/ Mathematics offered by other than parent department 2. Course offered by other departments in the college	OE	3	0	0	3
3	MTDS2103	**Dissertation-I/Industrial Project**	PJ	0	0	20	10
Total Credits							16

**Students going for Industrial Project/Thesis will complete these courses through MOOCs*

IV-SEMESTER

S.No	Course Code	Courses	Category	L	T	P	C
1	MTDS2201	**Dissertation-II**	PJ	0	0	32	16
Total Credits							16

Open Electives offered by the Department of Computer Science and Engineering for other Departments students

1. Python Programming
2. Principles of Cyber Security
3. Internet of Things
4. Machine Learning
5. Deep Learning
6. Next Generation Databases