



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India
DEPARTMENT OF CIVIL ENGINEERING

COURSE STRUCTURE AND SYLLABUS

For UG – R20

B. TECH - CIVIL ENGINEERING

(Applicable for batches admitted from 2020-2021)



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA - 533 003, Andhra Pradesh, India

Coordinator-IQAC
RKCE

PRINCIPAL
R K COLLEGE OF ENGINEERING
Kethanakonda (V), Ibrahimpatnam (M),
Vijayawada, AMARAVATI-521 456



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India
DEPARTMENT OF CIVIL ENGINEERING

III YEAR – I SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	PC501	Professional Core courses (STRUCTURAL ANALYSIS)	3	0	0	3
2	PC502	Professional Core courses (DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES)	3	0	0	3
3	PC503	Professional Core courses (GEOTECHNICAL ENGINEERING-1)	3	0	0	3
4	OE501	Open Elective Course/Job Oriented elective (OE-1)	3	0	0	3
5	PE501	Professional Elective courses	3	0	0	3
6	PC504	Professional Core courses Lab Survey Camp (Field work)	0	0	3	1.5
7	PC505	Professional Core courses Lab (GEOTECHNICAL ENGINEERING LAB)	0	0	3	1.5
8	PC501	Skill advanced course/ soft skill course* Design of Special Structure, Chimney, Hinge Tanks designs, spill ways etc.,	1	0	2	2
9	MC501	Mandatory Course (AICTE Suggested) Professional Ethics and Human Values	2	0	0	0
10	PR501	Summer Internship 2Months (Mandatory) after second year (to be evaluated during V semester)	0	0	3	1.5
Total Credits						21.5
Honors/ Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)			3	1	0	4

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DEPARTMENT OF CIVIL ENGINEERING

III YEAR – II SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	PC601	Professional Core courses (DESIGN AND DRAWING OF STEEL STRUCTURES)	3	0	0	3
2	PC602	Professional Core courses (WATER RESOURCE ENGINEERING)	3	0	0	3
3	PC603	Professional Core courses (GEOTECHNICAL ENGINEERING-II)	3	0	0	3
4	PE601	Professional Elective courses	3	0	0	3
5	OE601	Open Elective Course/Job oriented elective (OE-2)	3	0	0	3
6	PC604	Professional Core courses Lab (ESTIMATION, COSTING AND CONTRACTS)	0	0	3	1.5
7	PC605	Professional Core courses Lab (REMOTE SENSING & GIS LAB)	0	0	3	1.5
8	PC606	Professional Core courses Lab CIVIL ENGINEERING PRACTICE	0	0	3	1.5
9	SC601	Skill advanced course/ soft skill course* Computational Tools	1	0	2	2
10	MC601	Mandatory course (AICTE) (EMPLOYABILITY SKILLS)	2	0	0	0
11	PR601	Industrial/Research Internship (Mandatory) 2 Months	0	0	3	1.5
Total Credits						23
Honors/ Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)			3	1	0	4

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DEPARTMENT OF CIVIL ENGINEERING

IV YEAR – I SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	PE701	Professional Elective -III	3	0	0	3
2	PE702	Professional Elective -IV	3	0	0	3
3	PE703	Professional Elective -V	3	0	0	3
4	OE701	Open Elective Courses/ Job oriented elective (OE-III)	2	0	2	3
5	OE702	Open Elective Course/Job oriented elective (OE-IV)	2	0	2	3
6	HSC701	*Humanities and Social Science Elective	3	0	0	3
7	SC701	Skill advanced course/ soft skill course* Project planning, town planning,	1	0	2	2
8	PR701	Industrial/Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester)	0	0	3	1.5
Total Credits						21.5
Honors/ Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)			3	1	0	4

*There is a provision for the Universities/Institutions to implement AICTE mandatory course “Universal Human Values 2: Understanding Harmony” under Humanities and social science Elective in seventh semester for 3 credits.

IV YEAR – II SEMESTER

S.NO	CATEGORY	COURSE TITLE	L	T	P/D	C
1	Major Project	PROJ	-	-	-	12
INTERNSHIP (6 Months)						
Total Credits						12

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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

(Applicable for batches admitted from 2020-2021)



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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

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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DEPARTMENT OF MECHANICAL ENGINEERING

COURSE STRUCTURE

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
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DEPARTMENT OF MECHANICAL ENGINEERING

II YEAR I SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	BSC-5	Vector Calculus, Fourier Transforms and PDE(M-III)	3	0	0	3
2	PCC-1	Mechanics of Solids	3	0	0	3
3	PCC-2	Fluid Mechanics & Hydraulic Machines	3	0	0	3
4	PCC-3	Production Technology	3	0	0	3
5	PCC-4	Kinematics of Machinery	3	0	0	3
6	PCC-L1	Computer Aided Engineering Drawing Practice	0	0	3	1.5
7	PCC-L2	Fluid Mechanics & Hydraulic Machines Lab	0	0	3	1.5
8	PCC-L3	Production Technology Lab	0	0	3	1.5
9	SOC-1	Drafting and Modeling Lab	0	0	4	2
10	MC-3	Essence of Indian Traditional Knowledge	2	0	0	0
Total Credits						21.5

II YEAR II SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	ESC-6	Material Science & Metallurgy	3	0	0	3
2	BSC-6	Complex Variables and Statistical Methods	3	0	0	3
3	PCC-5	Dynamics of Machinery	3	0	0	3
4	PCC-6	Thermal Engineering-I	3	0	0	3
5	HSC-2	Industrial Engineering and Management	3	0	0	3
6	ESC-L4	Mechanics of Solids and Metallurgy Lab	0	0	3	1.5
7	PCC-L6	Machine Drawing Practice	0	0	3	1.5
8	PCC-L7	Theory of Machines Lab	0	0	3	1.5
9	SOC-2	Python Programming Lab	1	0	2	2
Total Credits						21.5
Honors/Minor courses			4	0	0	4

* At the end of II Year II Semester, students must complete summer internship spanning between 2 months (Minimum of 6 weeks), @ Industries/ Higher Learning Institutions/ APSSDC.

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DEPARTMENT OF MECHANICAL ENGINEERING

III B.TECH I SEMESTER

S No	Code	Course Title	Hours			Credits
			L	T	P	
1	PCC-7	Thermal Engineering-II	3	0	0	3
2	PCC-8	Design of Machine Members-I	3	0	0	3
3	PCC-9	Machining, Machine Tools & Metrology	3	0	0	3
4	OE-1	1. Sustainable Energy Technologies 2. Operations Research 3. Nano Technology 4. Thermal Management of Electronic systems	3	0	0	3
5	PE-1	1. Finite Element Methods 2. Industrial Robotics 3. Advanced Materials 4. Renewable Energy Sources 5. Mechanics of Composites 6. MOOCs (NPTEL/ Swayam) Course (12 Week duration)	3	0	0	3
6	PCC-L6	Machine Tools Lab	0	0	3	1.5
7	PCC-L7	Thermal Engineering Lab	0	0	3	1.5
8	SOC-3	Advanced Communication Skills Lab	1	0	2	2
9	MC – 4	Professional Ethics and Human Values	2	0	0	0
Evaluation of Summer Internship which is completed at the end of II B.Tech II Semester						1.5
Total credits						21.5
Honors/Minor courses			4	0	0	4

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III B.TECH II SEMESTER

S.No	Code	Course Title	Hours			Credits
			L	T	P	
1	PCC-10	Heat Transfer	3	0	0	3
2	PCC-11	Design of Machine Members-II	3	0	0	3
3	PCC-12	Introduction to Artificial Intelligence and Machine Learning	3	0	0	3
4	PE-2	1. Automobile Engineering 2. Smart Manufacturing 3. Advanced Mechanics of Solids 4. Statistical Quality Control 5. Industrial Hydraulics and Pneumatics 6. MOOCs (NPTEL/ Swayam) Course (12 Week duration)	3	0	0	3
5	OE-2	1. Industrial Robotics 2. Essentials of Mechanical Engineering 3. Advanced Materials 4. Introduction to Automobile Engineering	3	0	0	3
6	PCC-L8	Heat Transfer Lab	0	0	3	1.5
7	PCC-L9	CAE&CAM Lab	0	0	3	1.5
8	PCC-L10	Measurements & Metrology Lab	0	0	3	1.5
9	SOC-4	Artificial Intelligence and Machine Learning Lab	0	0	4	2
10	MC - 5	Research Methodology and IPR	2	0	0	0
			Total credits			21.5
Honors/Minor courses			4	0	0	4

* At the end of III Year II Semester, students shall complete summer internship spanning between 1 to 2 months at Industries/ Higher Learning Institutions/ APSSDC.

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DEPARTMENT OF MECHANICAL ENGINEERING

IV B.TECH I SEMESTER

S.No	Code	Course Title	Hours			Credits
			L	T	P	
1	PE-3	1. Mechanical Vibrations 2. Operations Research 3. Unconventional Machining Processes 4. Computational Fluid Dynamics 5. Gas Dynamics and Jet Propulsion 6. MOOCs (NPTEL/Swayam) Course (12 Week duration)	3	0	0	3
2	PE-4	1. Automation in Manufacturing 2. Power Plant Engineering 3. Big Data Analytics 4. Production Planning and Control 5. Condition Monitoring 6. MOOCs (NPTEL/Swayam) Course (12 Week duration)	3	0	0	3
3	PE-5	1. Advanced Manufacturing Processes 2. Mechatronics 3. Refrigeration & Air-Conditioning 4. Additive Manufacturing 5. Non Destructive Evaluation 6. MOOCs (NPTEL/Swayam) Course (12 Week duration)	3	0	0	3
4	OE-3	1. Additive Manufacturing 2. Mechatronics 3. Finite Element Methods 4. Introduction to Artificial Intelligence & Machine Learning	3	0	0	3
5	OE-4	1. Optimization Techniques 2. Smart Manufacturing 3. Safety Engineering 4. Operations Management	3	0	0	3
6	HSC-3	Universal Human Values: Understanding Harmony	3	0	0	3
7	SOC-5	Mechatronics Lab	0	0	4	2
Evaluation of Summer Internship which is completed at the end of III B.Tech II Semester						3
Total credits						23
Honors/Minor courses			4	0	0	4

IV B.TECH II SEMESTER

S No.	Category	Code	Course Title	Hours per week			Credits
				L	T	P	
1	Major Project	PROJ	Project work*	0	4	16	12
Total credits							12

*Students can complete project work @ Industries/ Higher Learning Institutions/ APSSDC.

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R-20 Syllabus for ECE, JNTUK w. e. f. 2020 – 21

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE STRUCTURE AND SYLLABUS

For UG – R20

B. TECH - ELECTRONICS AND COMMUNICATION ENGINEERING

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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:

1. Antenna and Wave Propagation
2. Electronic Measurements and Instrumentation
3. Computer Architecture & Organization

OE1:

Candidate should select the subject from list of subjects offered by other departments

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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:

1. Microwave Engineering
2. Mobile & Cellular Communication
3. Embedded Systems
4. CMOS Analog IC Design

OE2:

Candidate should select the subject from list of subjects offered by other departments

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
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) after third 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

<u>PE 3:</u> 1. Optical Communication 2. Digital Image Processing 3. Low Power VLSI Design	<u>PE5:</u> 1. Radar engineering 2. Pattern recognition & Machine Learning 3. Internet of Things
<u>PE4:</u> 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 in industry	-	-	-	12
INTERNSHIP (6 MONTHS)							
Total credits							12

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE STRUCTURE AND SYLLABUS

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

III B. Tech – I Semester						
S.No	Course Code	Courses	Hours per week			Credits
			L	T	P	
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 ^s	3	0	2	3+1
12	Honors	Any course from the Pool, as per the opted track	4	0	0	4

S- Integrated Course

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

III B. Tech – II Semester						
S.No	Course Code	Courses	Hours per week			Credits
			L	T	P	
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 (<i>Job Oriented</i>)	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 ^s	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

S- Integrated Course

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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.

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