

PROGRAM CURRICULUM

CIVIL ENGINEERING

for

B. TECH. FOUR YEAR DEGREE PROGRAM

(Applicable for the batches admitted from A.Y 2024-25)



ADITYA UNIVERSITY

Aditya Nagar, ADB Road, Surampalem - 533 437



Department of Civil Engineering

Vision

To emerge as a premier center of excellence in Civil Engineering by promoting holistic education, innovative thinking, and lifelong learning for a sustainable future.

Mission

M1: Deliver quality education through an industry-aligned curriculum and experiential learning

M2: Foster interdisciplinary research and technological advancement to address global challenges.

M3: Promote sustainable practices that contribute to societal development.

Program Educational Objectives (PEOs)

Graduates of the Program will

PEO1: Apply technical knowledge and leadership qualities to excel in the industry and higher education.

PEO2: Design sustainable infrastructure that addresses environmental and social needs.

PEO3: Apply research and innovative thinking to solve complex civil engineering problems.

Program Specific Outcomes (PSOs)

After successful completion of the program, the graduates will be able to

PSO1: Demonstrate the capability to plan, design and construct sustainable structures based on functional requirements.

PSO2: Apply technical and analytical skills to create efficient, safe, and sustainable infrastructure solutions.

PROGRAM OUTCOMES (PO's)

The 11 Program Outcomes are described as below.

After successful completion of the program, the graduates will be able to

- PO1 **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2 **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
- PO3 **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
- PO4 **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
- PO5 **Engineering tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
- PO6 **The Engineer and the world :** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
- PO7 **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
- PO8 **Individual and collaborative teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
- PO9 **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO10 **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO11 **Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**Department of Civil Engineering****B.Tech (CE) Program Curriculum – 2024**

(Applicable for the students submitted from the A.Y 2024-25)

UG Programs Offered

- B. Tech in (Civil Engineering)
- B. Tech in (Civil Engineering) with
 - Minor degree in Electrical and Electronics Engineering
 - Minor degree in Mechanical Engineering
 - Minor degree in Electronics and Communication Engineering
 - Minor degree in Computer Science and Engineering
 - Minor degree in Data Science
 - Minor degree in Artificial Intelligence and Machine Learning
 - Minor degree in Petroleum Technology
 - Minor degree in Mining Engineering
 - Minor degree in Agricultural Engineering
 - Minor degree in Entrepreneurship Development and Incubation
 - Minor Degree in Quantum Technologies

Minor Streams offered in B.Tech (Civil Engineering)

- Minor Stream in Structural Engineering
- Minor Stream in Environmental Geotechnics
- Minor Stream in Transportation Engineering
- Minor Stream in Integrated Design for Industrial Facilities Industry
Integrated Program- L & T

Credit Division Category-wise

S.No	Broad Category of Course	UGC	Credits
1	Major Core Courses (MCC)	80	81
2	Minor Stream Courses (MSC) (Or) University Open Elective Courses (UEC)	32	32
3	Multidisciplinary Courses (MDC)	9	10
4	Ability Enhancement Courses (AEC)	8	9
5	Skill Enhancement Courses (SEC)	9	9
6	Value Added Courses (VAC)	6-8	5
7	Summer Internships (SI)	2-4	4
8	Full Semester Internship (or) Project (PROJ)	12	10
9	Mandatory Courses(MC)		0
Total Credits to be earned for B.Tech Degree		160	160

Foundation Courses – FC

Intermediate-level Courses - IC

Advanced Courses – AC

Major Core Courses (MCC)

Course Code	Course Name	Level	L	T	P	C	CI E	SE E	Total	Pre-requisite
241MA001	Linear Algebra & Calculus	FC	2	1		3	50	50	100	-
241MA002	Differential Equations & Vector Calculus	FC	2	1		3	50	50	100	-
241MA003	Integral Transforms & Applications of Partial Differential Equations	IC	2	1		3	50	50	100	LAC
241MA004	Numerical Methods & Statistical Techniques	IC	2	1		3	50	50	100	ITAPDE
241PH001	Solid State Physics	FC	2		1	3	50	50	100	-
241CH001	Engineering Chemistry	FC	2		1	3	50	50	100	-
241IT001	IT & AI Skills	FC			2	2	50	50	100	-
241ME003	Engineering Workshop	FC			1	1	100		100	-
241ME001	Engineering Graphics	FC	1		2	3	50	50	100	-
241ME002	Engineering Mechanics	FC	2	1	1	4	50	50	100	-
241CE001	Construction Materials & Concrete Technology	FC	2		2	4	50	50	100	-
241CE002	Fluid Mechanics	IC	1	1	1	3	50	50	100	-
241CE003	Strength of Materials – I	IC	2		2	4	50	50	100	EM
241CE004	Engineering Geology	IC	2		1	3	50	50	100	-
241CE005	Geomatics Engineering	IC	1	1	2	4	50	50	100	-
241CE006	Hydraulics & Hydraulic Machinery	IC	1	1	1	3	50	50	100	FM
241CE007	Geotechnical Engineering – I	IC	2		2	4	50	50	100	-

241CE008	Strength of Materials – II	IC	2	1		3	50	50	100	SOM-1
241CE009	Structural Analysis	IC	2	1		3	50	50	100	SOM-1
241CE010	Geotechnical Engineering – II	IC	2	1		3	50	50	100	GE-1
241CE011	Environmental Engineering	IC	2		2	4	50	50	100	-
241CE012	Transportation Engineering	IC	1	1	1	3	50	50	100	-
241CE013	Estimating and Costing	IC	3			3	50	50	100	BP&CAD
241CE014	Design of Reinforced Concrete Elements	AC	2	1		3	50	50	100	SOM
241CE024	Design of Steel Structures	AC	2	1		3	50	50	100	SOM
241CE015	Hydrology & Irrigation with ML Techniques	AC	2	1		3	50	50	100	HHM
Total			44	15	22	81				

Multidisciplinary Courses (MDC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241CS001	Programming for Problem Solving Using C	FC	2		2	4	50	50	100	-
241EE001	Basic Electrical & Electronics Engineering	FC	2		2	4	50	50	100	-
241MB001	Engineering Economics & Management	FC	2			2	50	50	100	-
Total			6		4	10				

Ability Enhancement Courses(AEC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241EN001	Essential Cognitive Skills for Engineers	FC			1	1	100	-	100	-
241EN002	Advanced Cognitive Skills for Engineers (or) Proficiency in Foreign Language (Japanese/German/ Spanish/ French)	FC			1	1	100	-	100	CEE
241UC005										
241UC004										
241UC006										
241UC003										
241UC007	Design Thinking	FC			1	1	100	-	100	-
241UC008	Universal Human Values	FC	2			2	100	-	100	-
241UC009	Technical Paper Publication	AC			2	2	100	-	100	-
241CE079	Student Activity – Based Learning	AC				2				
Total			2		5	9				

Skill Enhancement Courses (SEC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241CE043	Building Planning & Computer Aided Drawing	FC			2	2	50	50	100	-
241CE017	3D Modelling of Building	FC			2	2	50	50	100	EG
241CE018	Geospatial AI	IC			1	1	100	-	100	-
241CE019	GeoStudio for Geotechnical Applications	AC			2	2	50	50	100	GT-1, GT-2
241CE020	Computer-Aided Structural Analysis & Design	AC			2	2	50	50	100	SA
Total					9	9				

Value Added Courses (VAC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241PE001	Sports & Yoga	FC			1	1	100	-	100	-
241UC010	Indian Cultural Heritage & Fine Arts	FC			1	1	100	-	100	-
241UC011	Employability Skills - I	FC			3	0	100	-	100	-
241UC013	Employability Skills – II	FC			3	0	100	-	100	ES-I
241UC014	Employability Skills – III	IC			3	0	100	-	100	ES-II
241UC015	Employability Skills – IV	IC			3	0	100	-	100	ES-III
241UC016	Employability Skills - V	AC			3	1	100	-	100	ES-IV
241CS002	Data Analysis using Python	IC			2	2	50	50	100	-
Total					19	5				

Summer Internships (SI)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241CE021	Summer Internship - I	IC			2	2	100	-	100	-
241CE022	Summer Internship - II	AC			2	2	100	-	100	-
Total					4	4				

Full Semester Internship (PROJ)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241CE023	Full Semester Internship (or) Project	AC			10	10	50	50	100	-
Total					10	10				

Mandatory Courses (MC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241AC001	Environmental Science	FC	2			0	100	-	100	-
241AC002	Constitution of India	FC	2			0	100	-	100	-
241AC003	Research Methodology	FC	2			0	100	-	100	-
241AC004	Intellectual Property Rights & Patents	FC	2			0	100	-	100	-
241AC005	Indian Knowledge Systems (IKS)	FC	2			0	100	-	100	-
Total			10			0				

Minor Stream: Structural Engineering

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241CE057	Construction & Project Management	FC	2			2	50	50	100	--
241CE025	Repair & Rehabilitation of Structures	FC	3			3	50	50	100	-
241CE026	Fire & Safety Engineering	FC	3			3	50	50	100	-
241CE027	Green Buildings	FC	3			3	50	50	100	-
241CE029	Construction Equipment & Machinery	FC	3			3	50	50	100	CM&CT
241CE028	Finite Element Methods	IC	2	1		3	50	50	100	SA
241CE031	Construction Contract Management	IC	3			3	50	50	100	-
241CE030	Pre-stressed Concrete Structures	IC	3			3	50	50	100	-
241CE032	Design of Ocean Structures & Foundation	IC	2	1		3	50	50	100	-
241CE033	Analysis & Design of Masonry Structures	IC	2	1		3	50	50	100	-
241CE034	Design of Tall Buildings	AC	2	1		3	50	50	100	-
Total			28	4		32				

Minor Stream: Environmental Geotechnics

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241CE041	Geoenvironmental Engineering	FC	2			2	50	50	100	ES
241CE040	Fundamentals of Soil Behaviour	FC	2	1		3	50	50	100	-
241CE039	Flow & Transport in Porous Media	FC	3			3	50	50	100	-
241CE044	Land fill Engineering & Remediation Technology	FC	3			3	50	50	100	-
241CE036	Environmental Impact & Risk Management	FC	3			3	50	50	100	-
241CE035	Climate Change and Environmental Issues	IC	3			3	50	50	100	-
241CE042	Ground Improvement Techniques	IC	3			3	50	50	100	GTE-2
241CE038	Expansive Soils	IC	3			3	50	50	100	GTE-1&2
241CE037	Environmental Management	IC	3			3	50	50	100	-
241CE045	Marine Foundations	AC	3			3	50	50	100	GTE-2
241CE073	Water Resource Management	AC	3			3	50	50	100	-
Total			31	1		32				

Minor Stream: Transportation Engineering

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241CE053	Pavement Materials & Characterization	FC	2			2	50	50	100	-
241CE047	Docks & Harbour Engineering	FC	3			3	50	50	100	-
241CE054	Railway Engineering	FC	3			3	50	50	100	-
241CE055	Road Safety Analysis	FC	3			3	50	50	100	-
241CE048	Highway Construction & Practices	FC	3			3	50	50	100	-
241CE052	Pavement Management Systems	FC	3			3	50	50	100	-
241CE051	Pavement Drainage Systems	FC	3			3	50	50	100	-
241CE046	Airport Planning & Design	IC	3			3	50	50	100	-
241CE056	Urban Transportation Planning	IC	3			3	50	50	100	-
241CE049	Intelligent Transportation Systems	AC	3			3	50	50	100	-
241CE050	Pavement Design & Evaluation	AC	3			3	50	50	100	-
Total			32			32				

**Minor Stream: Integrated Design for Industrial Facilities Industry Integrated
Program- L & T[#]**

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241CE069	Building Information Modelling in Construction	FC			3	3	50	50	100	-
241CE067	Sustainability Practices in Design of Buildings	IC			3	3	50	50	100	-
241CE070	Formwork Engineering Practices	IC			2	2	50	50	100	-
241CE072	Design & Execution of Pile Foundations	IC			3	3	50	50	100	-
241CE061	Metro Rail Transportation Systems & Construction	IC			3	3	50	50	100	-
241CE071	Deep Excavations, Foundations & Tunnels	AC			3	3	50	50	100	-
241CE068	Bridge Engineering Design Practices	AC			3	3	50	50	100	-
241CE016	Geospatial Techniques in Practice	AC			3	3	50	50	100	-
241CE063	Pre Engineered Buildings	AC			3	3	50	50	100	-
241CE064	Precast Members & Construction	AC			3	3	50	50	100	-
241CE060	Hydropower Structures	AC			3	3	50	50	100	-
Total							32	32		

Note:

- The syllabus for the industry partnered courses will be released in the department as and when required

UNIVERSITY OPEN ELECTIVE COURSES (UEC)
AI & ML

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Offered to Programs	Pre-requisite
241AI002	Artificial Intelligence	FC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241AI005	Machine Learning	FC	2		2	4	50	50	100	CE,EEE,ME, ECE, PT,Min.E	DAP
241AI027	AI & Data Science	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	DAP
241AI028	AI in Healthcare	IC	2		1	3	50	50	100	CE,EEE, ME, ECE,CSE, IT, AIML,CSE (DS) PT,Min.E	DAP
241AI011	Deep Learning	IC	2		2	4	50	50	100	CE,EEE,ME, ECE, PT,Min.E	DAP
241AI010	Natural Language Processing	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	DAP
241AI009	Reinforcement Learning	AC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	DAP
241AI029	AI in Agriculture	AC	2		1	3	50	50	100	CE,EEE,ME, ECE,CSE,IT, AIML,CSE(DS) PT,Min.E	DAP
241AI030	Robotics & AI	AC	2		1	3	50	50	100	CE,EEE,ME, ECE,CSE,IT, AIML,CSE(DS) PT,Min.E	DAP
241AI031	AI in Finance & Economics	AC	2		1	3	50	50	100	CE,EEE,ME, ECE,CSE,IT, AIML,CSE(DS) PT,Min.E	DAP
Total			20		12	32					

Production Excellence											
Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Offered to Programs	Pre-requisite
241ME081	Fundamentals of Production Excellence	FC	2			2	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML,CSE(DS) PT,Min.E	-
241ME082	Six Sigma for Production Excellence	FC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE
241ME083	Quality Excellence in Production	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE
241ME084	Digital Transformation for Production Excellence	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE
241ME085	Agile Production Systems	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE
241ME086	Process Excellence & Optimization	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE
241ME087	Risk Management in Production Excellence	AC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE
241ME088	Ethical & Social Responsibility in Production Excellence	AC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE
241ME089	Data-Driven Decision Making for Production Excellence	AC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE
241ME058	Industry 5.0 for Engineers	AC	3			3	50	50	100	CE,EEE, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE
241ME090	Cost Excellence in Production	AC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE
Total			23		9	32					

Supply Chain Management											
Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Offered to Programs	Pre-requisite
241MB017	Introduction to Supply Chain Management	FC	2			2	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML,CSE(DS) PT,Min.E	-
241MB018	Logistics & Distribution Management	FC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
241MB019	Supply Chain Project Management	IC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
241MB020	Supply Chain Innovation & Trends	IC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
241MB021	Supply Chain Analytics	IC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
241MB022	Demand Planning & Forecasting	IC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
241MB023	Supply Chain Risk Management	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
241MB024	Inventory Management & Control	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
241MB025	E-Commerce & Supply Chain Management	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
241MB026	Operations Management	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
241MB027	Supply Chain Ethics & Corporate Social Responsibility (CSR)	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
Total			32			32					

Sustainability											
Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Offered to Programs	Pre-requisite
241CE074	Introduction to Sustainable Development	FC	2			2	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML,CSE(DS) PT,Min.E	-
241CE066	Natural Disaster Management & Mitigation	FC	3			3	50	50	100	EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241CE081	Waste Water Management	IC	3			3	50	50	100	EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241CE082	Integrated Solid Waste Management for a Smart City	IC	3			3	50	50	100	EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241CE083	Watershed Management	IC	3			3	50	50	100	EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241EE033	Energy Audit, Conservation & Management	IC	3			3	50	50	100	CE, ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	BEEE
241EE006	Electric Power Generation, Transmission & Distribution Systems	AC	3			3	50	50	100	CE, ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	BEEE
241CE075	Sustainable Agriculture & Food Systems	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241CE076	Sustainable Supply Chain Management	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241CE077	Sustainable Production Excellence	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241CE078	AI in Environmental Science and Sustainability	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
Total			32			32					

Security											
Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Offered to Programs	Pre-requisite
241CS032	Cybersecurity Essentials	FC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241IT035	Security in Software Development	FC	3			3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241CS028	Ethical Hacking	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241CS069	Cloud Security	IC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241IT036	Security & Compliance in Business	IC	3			3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241IT037	Cryptography & Data Security	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241IT038	Security Awareness & Social Engineering	AC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241IT039	Cybersecurity Policy & Strategy	AC	3			3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241IT040	Security in Emerging Technologies	AC	3			3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241CS030	Information Security Analysis & Audit	AC	2			2	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241IT041	Financial Information Security & Privacy	AC	3			3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
Total			25		07	32					

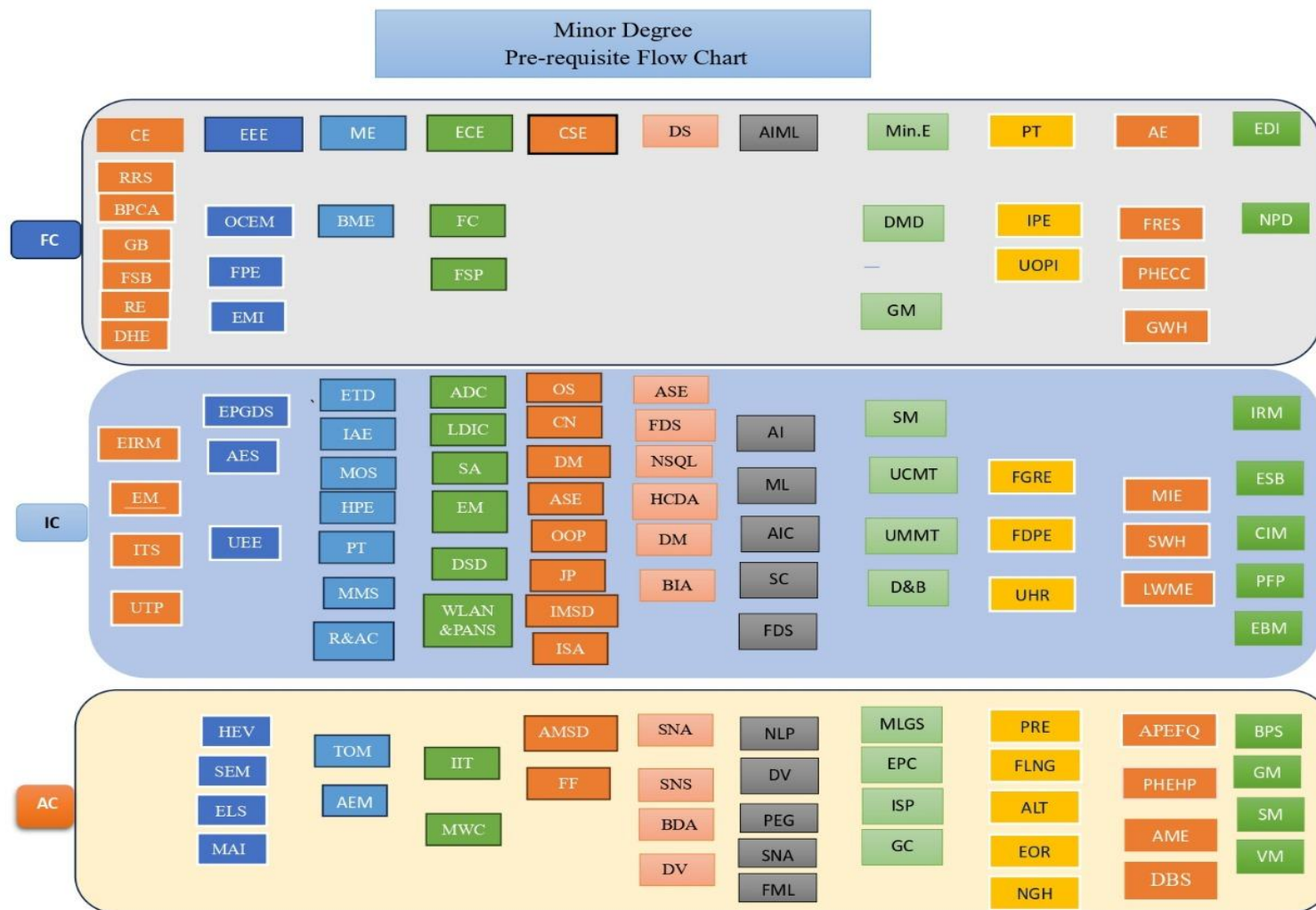
Others											
Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Offered to Programs	Pre-requisite
241CE080	Remote Sensing & GIS Applications	FC	3			3	50	50	100	EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241EE036	Electric Energy Storage Systems	FC	3			3	50	50	100	CE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	BEEE
241EE043	Electrical safety	IC	3			3	50	50	100	CE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	BEEE
241EE054	Hybrid & Electric Vehicles	IC	3			3	50	50	100	CE, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	BEEE
241ME073	Organizational Behaviour	FC	3			3	50	50	100	CE,EEE, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241ME036	Sustainable Energy Systems	FC	3			3	50	50	100	CE, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241ME037	Solar Energy Systems	FC	3			3	50	50	100	CE,EEE,ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241ME060	Composite Materials	IC	3			3	50	50	100	CE,EEE,ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	SSP/MP
241EC082	Communication Systems	FC	3			3	50	50	100	CE,EEE,ME,CSE,IT, AIML, CSE(DS) PT,Min.E	-
241EC083	Electronic Measurements & Instrumentation	FC	3			3	50	50	100	CE,EEE,ME, CSE,IT, AIML, CSE(DS) PT,Min.E	BEEE
241EC084	Introduction to Embedded Systems	FC	3			3	50	50	100	CE,EEE,ME, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241EC085	Fundamentals of Image Processing	FC	3			3	50	50	100	CE,EEE,ME, CSE,IT, AIML, CSE(DS) PT,Min.E	
241EC077	Sensors and Transducers	IC	3			3	50	50	100	CE,EEE,ME, CSE,IT, AIML, CSE(DS) PT,Min.E	
241CS003	Data Structures	FC	2		2	4	50	50	100	CE,EEE,ME, ECE, PT,Min.E	PPSC
241CS065	Computer Organization	FC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241CS013	Operating Systems	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-

241IT005	Database Management Systems	IC	2		2	4	50	50	100	CE,EEE,ME, ECE, PT,Min.E	PPSC
241IT007	Agile Software Engineering	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	PPSC
241CS007	Computer Networks	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241IT006	Java Programming	IC	2		2	4	50	50	100	CE,EEE,ME, ECE, PT,Min.E	PPSC
241CS068	Fundamentals of RedHat Enterprise Linux	FC			2	2	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241CS067	AWS Cloud Foundations	IC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241CS066	AWS Cloud Development	AC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241CS070	Continuous integration & delivery using DevOps	AC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241IT024	Fundamentals of Salesforce Administration	FC			2	2	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241IT034	Advanced Salesforce Administration	AC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241IT023	Principles of Pega Systems	IC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241IT026	Pega System Architecture & Design	AC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
241MB004	Entrepreneurship Development & Incubation	IC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241MB005	Business Ethics & Corporate Governance	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241MB006	Entrepreneurship Development & Business Management	AC	1		2	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
241EC029	SoC Design	AC	3			3	50	50	100	CE, EEE, ME, CSE, IT, AIML, CSE (DS), PT, Min.E.	MPMC
241CS023	Cloud Computing	FC	2		2	4	50	50	100	CE, EEE, ME, ECE, PT, Min.E.	-

FOUNDATION COURSES
INTERMEDIATE-LEVEL COURSES
ADVANCED COURSES

LAC	Linear Algebra & Calculus	ITAPDE	Integral Transforms & Applications of Partial Differential Equations	DRCS	Design of Reinforced Concrete Elements
DEVC-	Differential Equations & Vector Calculus	NMST	Numerical Methods & Statistical Techniques	DSS	Design of Steel Structures
EC	Engineering Chemistry	FM	Fluid Mechanics	HI ML	Hydrology & Irrigation with ML Techniques
SSP	Solid State Physics	SOM-1	Strength of Materials -1	TPW	Technical Paper Writing
EG	Engineering Graphics	EG	Engineering Geology	GEO	Geostudio for Geotechnical Applications
EM	Engineering Mechanics	GE	Geomatics Engineering	CASAD	Computer Aided Structural Analysis & Design
CMCT	Construction Materials & Concrete Technology	BPCAD	Building Planning & Computer Aided Drawing	CASA& D	Computer Aided Structural Analysis & Design
PPS Using C	Programming for Problem Solving Using C	H&HM	Hydraulics & Hydraulic Machinery	SI	Summer Internship -II
BEEE	Basic Electrical & Electronics Engineering	GTE	Geotechnical Engineering -1	Proj	Full Semester Internship
ECSE	Essential Cognitive Skills for Engineers	SOM-II	Strength of Materials -II	ES-V	Employability Skills -V
ACEE	Advanced Cognitive Skills for Engineers	SA	Structural Analysis		
UHV	Universal Human Value	GTE	Geotechnical Engineering-II		
DT	Design Thinking	EE	Environmental Engineering		
IT AI	IT & AI Skills	TE	Transportation Engineering		
SY	Sports & Yoga	ESC	Estimating and Costing		

ICHF	Indian Cultural Heritage & Fine Arts	DAP	Data Analysis Using Python
ENGW	Engineering Workshop	GEO AI	Geospatial AI
ES	Environmental Science	SI	Summer Internship
CI	Constitution of India	ES-III	Employability Skills -III
BE	Biology for Engineers	ES-IV	Employability Skills -IV
RM	Research Methodology		
IPRP	Intellectual Property Rights & Patents		
BE	Biology for Engineers		
EEM	Engineering Economics & Management		
ES-I	Employability Skills -I		
ES-II	Employability Skills -II		



Minor Stream	FOUNDATION COURSES	INTERMEDIATE-LEVEL COURSES	ADVANCED COURSES
SE	CPM Construction & Project Management	FEM Finite Element Methods	FOS Foundation of Offshore Structures
	RRS Repair & Rehabilitation of Structures	OSM Construction Contract Management	
	FSE Fire & Safety Engineering	PSC Prestressed Concrete Structures	
	IOE Green Buildings	DOS&F Design of Ocean Structures and Foundations	DTB Design of Tall Buildings
	CE&M Construction Equipment & Machinery	A&DMS Analysis & Design of Masonry Structures	
EG	GE Geoenvironmental Engineering	BTC Climate Change & Environmental Issues	MF Marine Foundations
	FSB Fundamentals of Soil Behaviour	GIT Ground Improvement Techniques	
	FTPM Flow & Transport in Porous Media	ES Expansive Soil	
	LERT Land fill Engineering & Remediation Technology	EM Environmental Management	EBT Water Resource Management
	EIRM Environmental Impact & Risk Management		
TE	PMC Pavement Materials & Characteristics	APD Airport Planning & Design	ITS Intelligent Transportation Systems
	DHE Docks & Harbour Engineering	UTP Urban Transportation Planning	PDE Pavement Design & Evaluation
	RE Railway Engineering		
	RSA Road Safety Analysis		
	HCP Highway Construction & Practices		
IDIFII L&T	PMS Pavement Management Systems		
	PDS Pavement Drainage System		
		SPDB Sustainability Practice in Design of Buildings	DEFT Deep Excavations, Foundations & Tunnels
		FEP Formwork Engineering Practices	
		DEPF Design & Execution of Pile Foundations	PEB Pre-engineered Buildings
		BEDP Bridge Engineering Design Practices	
		PMC Precast Members & Construction	
		HPS Hydropower Systems	
		GTP Geospatial Techniques in Practices	
		MRTS&C Metro Rail Transportation System & Construction	

Suggestive Semester-wise Curriculum

I SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241MA001	Linear Algebra & Calculus	MCC	FC	2	1		3	4
241PH001	Solid State Physics	MCC	FC	2		1	3	4
241ME001	Engineering Graphics	MCC	FC	1		2	3	5
241IT001	IT & AI Skills	MCC	FC			2	2	4
241ME003	Engineering Workshop	MCC	FC			1	1	2
241EE001	Basic Electrical & Electronics Engineering	MDC	MC	2		2	4	6
241EN001	Essential Cognitive Skills for Engineers	AEC	FC			1	1	2
241UC008	Universal Human Values	AEC	FC	2			2	2
241PE001	Sports & Yoga	VAC	FC			1	1	2
Total				9	1	10	20	31

II SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241MA002	Differential Equations & Vector Calculus	MCC	FC	2	1		3	4
241CH001	Engineering Chemistry	MCC	FC	2		1	3	4
241ME002	Engineering Mechanics	MCC	FC	2	1	1	4	5
241CE001	Construction Materials & Concrete Technology	MCC	FC	2		2	4	6
241CS001	Programming for Problem Solving Using C	MDC	FC	2		2	4	6
241EN002	Advanced Cognitive Skills for Engineers (or) Proficiency in Foreign Language (Japanese/German/ Spanish/ French)	AEC	FC			1	1	2
241UC005								
241UC004								
241UC003								
241UC006								
241UC007	Design Thinking	AEC	FC			1	1	2
241UC010	Indian Cultural Heritage & Fine Arts	VAC	FC			1	1	2
241UC011	Employability Skills-I	VAC	FC			3	0	3
241AC001	Environmental Science	MC	FC	2			0	2
Total				12	2	12	21	36

III SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241MA003	Integral Transforms & Applications of Partial Differential Equations	MCC	IC	2	1		3	4
241CE003	Strength of Materials – I	MCC	IC	2		2	4	6
241CE004	Engineering Geology	MCC	IC	2		1	3	4
241CE002	Fluid Mechanics	MCC	IC	1	1	1	3	4
241CE005	Geomatics Engineering	MCC	IC	1	1	2	4	6
241MB001	Engineering Economics & Management	MDC	FC	2			2	2
241CE043	Building Planning & Computer Aided Drawing	SEC	IC			2	2	4
241UC013	Employability Skills-II	VAC	FC			3	0	3
241AC002	Constitution of India	MC	FC	2			0	2
Total				12	3	11	21	35

IV SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241MA004	Numerical Methods & Statistical Techniques	MCC	IC	2	1		3	4
241CE006	Hydraulics & Hydraulic Machinery	MCC	IC	1	1	1	3	4
241CE008	Strength of Materials – II	MCC	IC	2	1		3	3
241CE007	Geotechnical Engineering – I	MCC	IC	2		2	4	6
241CE009	Structural Analysis	MCC	IC	2	1		3	3
	Minor Stream Course-1 (or) University Open Elective Course – 1	MSC/UEC	FC/IC	2			2	2
241CE017	3D-Modeling of Building	SEC	FC			2	2	4
241CS002	Data Analysis Using Python	VAC	IC			2	2	4
241UC014	Employability Skills-III	VAC	IC			3	0	3
241AC003	Research Methodology	MC	FC	2			0	2
Total				13	4	10	22	35

V SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241CE014	Design of Reinforced Concrete Elements	MCC	AC	2	1		3	3
241CE010	Geotechnical Engineering – II	MCC	IC	2	1		3	3
241CE012	Transportation Engineering	MCC	IC	1	1	1	3	4
	Minor Stream Course-2 (or) University Open Elective Course -2	MSC/UEC	FC/IC	3			3	3
	Minor Stream Course-3 (or) University Open Elective Course -3	MSC/UEC	IC/AC	3			3	3
	Minor Stream Course-4 (or) University Open Elective Course -4	MSC/UEC	IC/AC	3			3	3
241CE020	Computer-Aided Structural Analysis & Design	SEC	AC			2	2	4
241UC015	Employability Skills-IV	VAC	IC			3	0	3
241CE021	Summer Internship- 1	SI	IC			2	2	4
241AC004	Intellectual Property Rights & Patents	MC	FC	2			0	2
	Total			16	3	9	22	32

VI SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241CE024	Design of Steel Structures	MCC	AC	2	1		3	3
241CE015	Hydrology & Irrigation with ML Techniques	MCC	AC	2	1		3	3
241CE011	Environmental Engineering	MCC	IC	2		2	4	6
	Minor Stream Course-5 (or) University Open Elective Course -5	MSC/UEC	IC/AC	3			3	3
	Minor Stream Course -6 (or) University Open Elective Course -6	MSC/UEC	IC/AC	3			3	3
	Minor Stream Course -7 (or) University Open Elective Course -7	MSC/UEC	IC/AC	3			3	3
241CE018	Geospatial AI	SEC	IC			1	1	2
241AC005	Indian Knowledge Systems (IKS)	MC	FC	2			0	2
	Total			17	2	3	20	25

VII SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241CE013	Estimating & Costing	MCC	IC	3			3	3
	Minor Stream Course -8 (or) University Open Elective Course -8	MSC/UEC	AC	3			3	3
	Minor Stream Course -9(or) University Open Elective Course -9	MSC/UEC	AC	3			3	3
	Minor Stream Course -10 (or) University Open Elective Course -10	MSC/UEC	AC	3			3	3
	Minor Stream Course -11(or) University Open Elective Course -11	MSC/UEC	AC	3			3	3
241CE019	GeoStudio for Geotechnical Applications	SEC	AC			2	2	4
241CE022	Summer Internship-II	SI	AC			2	2	2
Total				15		4	19	21

VIII SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241UC009	Technical Paper Publication	AEC	AC			2	2	4
241UC016	Employability Skills-V	VAC	AC			3	1	3
241CE079	Student Activity – Based Learning	VAC	AC				2	
241CE023	Full Semester Internship	PROJ	AC			10	10	20
Total						15	15	27

TotalCredit:160

* To acquire a minor degree, a student has to earn 20 credits in addition to the 160 credits.

Minor Degree in Civil Engineering (offered to other branches students):

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241CE025	Repair & Rehabilitation of Structures	FC	3			3	50	50	100	-
241CE043	Building Planning & Computer-Aided Drawing	FC			2	2	50	50	100	-
241CE027	Green Buildings	FC	3			3	50	50	100	-
241CE040	Fundamentals of Soil Behaviour	FC	2	1		3	50	50	100	-
241CE054	Railway Engineering	FC	3			3	50	50	100	-
241CE047	Docks & Harbour Engineering									
241CE036	Environmental Impact & Risk Management	IC	3			3	50	50	100	-
241CE037	Environmental Management									
241CE056	Urban Transportation Planning	IC	3			3	50	50	100	-
241CE049	Intelligent Transportation Systems									
Total			18		2	20				

Minor Degree in Electrical and Electronics Engineering

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241EE055	Operation & Control of Electric machines	FC	2			2	50	50	100	BEEE
241EE056	Fundamentals of Power Electronics	FC	2			2	50	50	100	BEEE
241EE013	Electrical Measurements & Instrumentation	FC	2		2	4	50	50	100	ENA-1/BEEE
241EE006	Electric Power Generation and Distribution Systems	IC	3			3	50	50	100	ENA-1/BEEE
241EE034	Alternative Energy Sources (or)	IC	3			3	50	50	100	EPGD S/ BEEE/ ISM
241EE027	Utilization of Electrical Energy									
241EE037	Hybrid Electric Vehicles (or)	AC	3			3	50	50	100	FPE/ OCEM
241EE035	Special Electric machines									
241EE043	Electrical Safety (or)	AC	3			3	50	50	100	EPGD S/PSA
241EE030	Methods & Algorithms for Intelligent Control									
Total			18		2	20				

Minor Degree in Mechanical Engineering

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241ME074	Basic Mechanical Engineering	FC	2			2	50	50	100	-
241ME004	Engineering Thermodynamics	IC	2	1		3	50	50	100	SSP/MP
241ME077	Introduction to Automobile Engineering (or)	IC	3			3	50	50	100	SSP/MP
241ME078	Mechanics of Solids									
241ME012	Heat Power Engineering (or)	IC	2	1		3	50	50	100	ETD
241ME040	Refrigeration & Air Conditioning									
241ME075	Production Technology	IC	3			3	50	50	100	EW
241ME076	Metallurgy & Material Science	IC	3			3	50	50	100	SSP/MP
241ME079	Theory of Machines (or)	AC	3			3	50	50	100	SSP/MP
241ME080	Advanced Engineering Metrology									
Total			18	2		20				

Minor Degree in Electronics and Communication Engineering

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-Requisite
241EC087	Fundamentals of Communications	FC	2		1	3	50	50	100	-
241EC088	Fundamentals of Signal Processing	FC	2		1	3	50	50	100	-
241EC089	Analog & Digital Circuits	IC	2			2	50	50	100	BEEE
241EC042	Wireless LAN's & PAN's	IC	3			3	50	50	100	-
241EC090	Linear & Digital IC Applications	IC	3			3	50	50	100	ADC
241EC091	(or) Sensors & Actuators									
241EC092	Embedded Microcontrollers	IC	2		1	3	50	50	100	ADC, PPSC
241EC093	(or) Digital System Design									
241EC067	Introduction to Internet of things	AC	2		1	3	50	50	100	EM, WLAN's & PAN's
241EC074	(or) Modern Wireless Communications		3			3	50	50	100	FC
Total			16		4	20				

Minor Degree in Computer Science and Engineering

Course Code	Course Title	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241CS013	Operating Systems	IC	2		1	3	50	50	100	-
241CS007	Computer Networks	IC	2		1	3	50	50	100	-
241IT007	Agile Software Engineering	IC	2		1	3	50	50	100	PPSC
241AI003	Data Mining	IC	2		1	3	50	50	100	-
241CS008	Object Oriented Programming through C++	IC	2		2	4	50	50	100	PPSC
241IT006	(or) Java Programming									
241CS016	Introduction to MERN Stack Development	IC			2	2	-	100	100	JP
241CS030	(or) Information Security Analysis & Audit	IC	2			2	50	50	100	-
241CS018	Advanced MERN Stack Development	AC			2	2	-	100	100	IMSD
241IT012	(or) Flutter Fundamentals	AC			2	2	50	50	100	-
Total			12		10	20				

Minor Degree in Data Science

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241IT007	Agile Software Engineering	IC	2		1	3	50	50	100	PPSC
241CS034	Fundamentals of Data Science	IC	2		1	3	50	50	100	-
241CS012	NoSQL Databases	IC	2			2	50	50	100	-
241AI003	Data Mining	IC	2		1	3	50	50	100	-
241CS037	Health Care Data Analytics									-
241CS036	(or) Business Intelligence & Analytics	IC	2		1	3	50	50	100	PPSC
241AI004	Big Data Analytics									DM
241AI019	(or) Data Visualization	AC	2		1	3	50	50	100	DAP
241CS041	Social Network Analysis									
241CS040	(or) Social Networks & Semantic Web	AC	2		1	3	50	50	100	-
	Total		14		6	20				

Minor Degree in Artificial Intelligence and Machine Learning

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241AI002	Artificial Intelligence	IC	2		1	3	50	50	100	-
241AI005	Machine Learning	IC	2		2	4	50	50	100	DAP
241AI015	AI Chatbots	IC	2			2	50	50	100	AI
241AI014	Soft Computing (or)	IC	2		1	3	50	50	100	AI
241CS034	Fundamentals of Data Science		2		1	3	50	50	100	-
241AI010	Natural Language Processing (or)	AC	2		1	3	50	50	100	DAP
241AI019	Data Visualization									
241AI016	Prompt Engineering and GenAI (or)	AC	2		1	3	50	50	100	ML
241CS041	Social Network Analysis									
241AI017	Federated Machine Learning	AC	2			2	50	50	100	ML
TOTAL			15		5	20				

Minor Degree in Petroleum Technology

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241PT027	Introduction to Petroleum Engineering	FC	2			2	50	50	100	-
241PT035	Unit Operations in Petroleum Industry	FC	3			3	50	50	100	-
241PT047	Fundamentals of Geology & Reservoir Engineering	IC	3			3	50	50	100	-
241PT048	Fundamentals of Drilling & Production Engineering (or)	IC	3			3	50	50	100	-
241PT016	Unconventional Hydrocarbon Resources									
241PT049	Natural Gas Hydrates (or)	AC	3			3	50	50	100	-
241PT005	Fundamentals of Liquefied Natural Gas									
241PT050	Artificial Lift Techniques (or)	AC	3			3	50	50	100	-
241PT003	Enhanced Oil Recovery									
241PT012	Petroleum Refinery Engineering	AC	3			3	50	50	100	-
Total			20			20				

Minor Degree in Mining Engineering

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241MN003	Development of Mineral Deposits	FC	3			3	50	50	100	-
241MN041	Green Mining	FC	3			3	50	50	100	-
241MN006	Surface Mining	IC	3			3	50	50	100	DMD
241MN024	Drilling & Blasting	IC	3			3	50	50	100	DMD
241MN007	Underground Coal Mining Technology	IC	3			3	50	50	100	DMD
241MN008	(or) Underground Metal Mining Technology									
241MN014	Mine Legislation & General Safety	AC	3			3	50	50	100	UCMT / UMMT
241MN028	(or) Environmental Pollution & Control									
241MN045	Industrial Safety Practices	AC	2			2	50	50	100	-
241MN046	(or) Ground Control									
Total			20			20				

Minor Degree in Agricultural Engineering

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241AE082	Fundamentals of Renewable Energy Sources	FC	3			3	50	50	100	-
241AE083	Post-harvest Engineering of Cereal Crops	FC	3			3	50	50	100	-
241AE084	Ground Water Hydrology	FC	3			3	50	50	100	-
241AE085	Micro Irrigation Systems	IC	2			2	50	50	100	-
241AE086	Surface Water Hydrology (or)	IC	3			3	50	50	100	GWH
241AE087	Land & Water Management Engineering									
241AE088	Agricultural Process Engineering & Food Quality (or)	AC	3			3	50	50	100	PHECC
241AE089	Post-harvest Engineering for Horticultural Prod									
241AE090	Agricultural & Machinery Equipment (or)	AC	3	0	0	3	50	50	100	FRES
241AE091	Design of Bio-energy systems									
Total			20			20				

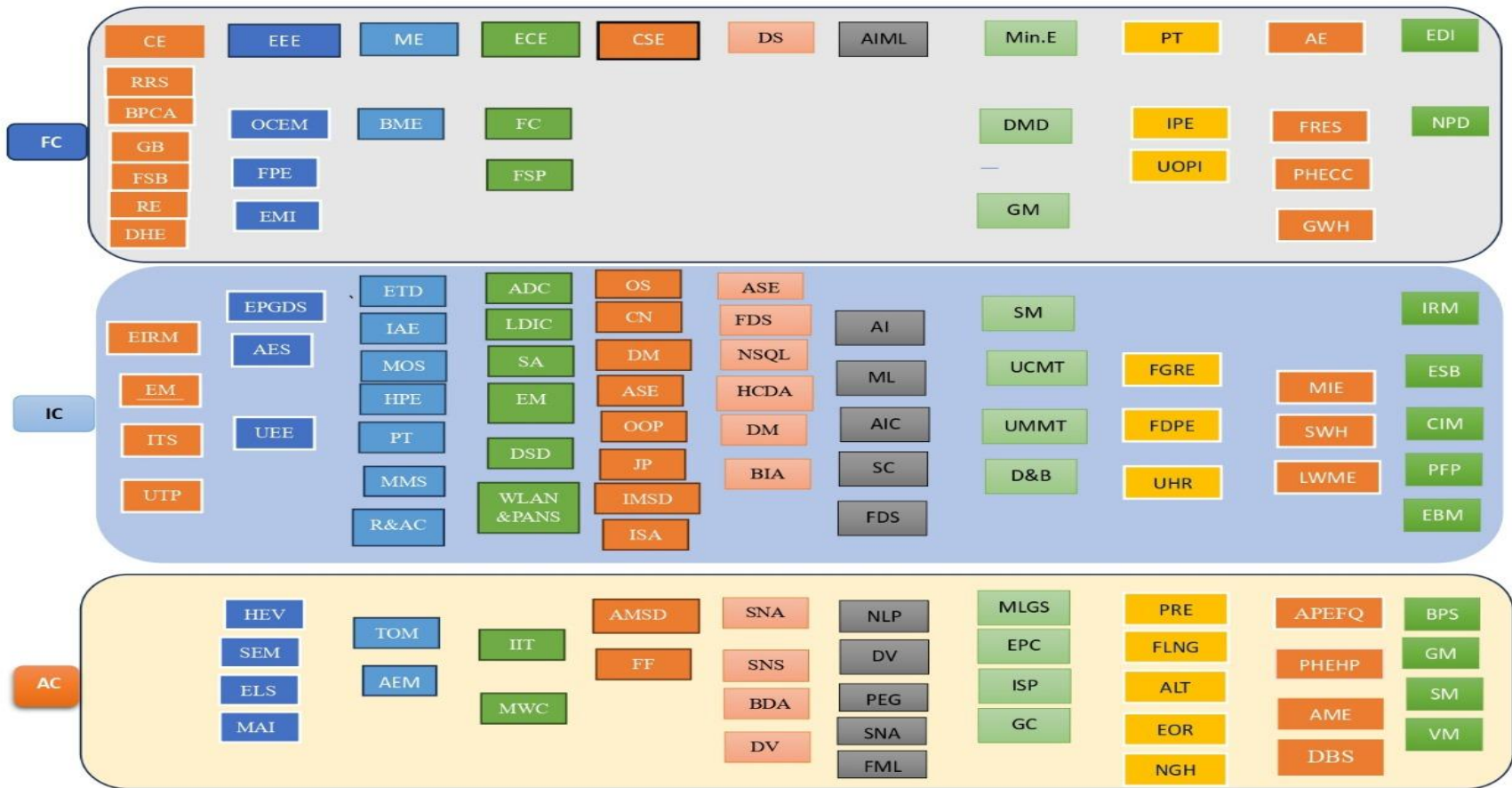
Minor Degree in Entrepreneurship Development and Incubation

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241MB007	New Product Development	FC	3			3	50	50	100	-
241MB008	Entrepreneurship & Small Business Management	IC	2			2	50	50	100	-
241MB009	Insurance & Risk Management	IC	3			3	50	50	100	-
241MB010	Change & Innovations Management	IC	3			3	50	50	100	-
241MB011	Personal Financial Planning	IC	3			3	50	50	100	-
241MB012	(or) E-Business management									
241MB013	Business Policy & Strategic Management	AC	3			3	50	50	100	-
241MB014	(or) Green Marketing									
241MB015	Startup Management	AC	3			3	50	50	100	-
241MB016	(or) Venture Management									
Total			20			20				

Minor Degree in Quantum Technologies

S.No.	Course Code	Course Name	L	T	P	C	Semester
Mandatory Courses							
1	241EC097	Survey of Quantum technologies and Application	3	0	0	3	IV
2	241EC098	Foundations of Quantum Technologies	3	0	0	3	V
3	241EC099	Basic Programming Lab (or)	1	0	2	3	V
	241EC100	Basic Laboratory Course for Quantum Technologies					
4	241EC101	Quantum Algorithms and Cryptography	12 week 3 Credit - NPTEL MOOC			3	VII/VIII
Any One course from the below							
5	241EC102	Introduction to Quantum Computation	3	0	0	3	VI
6	241EC103	Introduction to Quantum Communication	3	0	0	3	VI
7	241EC104	Introduction to Quantum Sensing	3	0	0	3	VI
8	241EC105	Introduction to Quantum Materials	3	0	0	3	VI
Any One course from the below							
9	241EC106	Engineering Foundations of Quantum Technologies	3	0	0	3	VII
10	241EC107	Solid State Physics for Quantum Technologies	3	0	0	3	VII
11	241EC108	Quantum Optics	3	0	0	3	VII
12	241EC109	Quantum Cybersecurity	3	0	0	3	VII
13	241EC110	Quantum Machine Learning	3	0	0	3	VII
Total			18	0	0	18	

Minor Degree Pre-requisite Flow Chart



Dept.	FOUNDATION COURSE	INTERMEDIATE- LEVEL COURSE	ADVANCED COURSE			
CE	RRS	Repair & Rehabilitation of Structures	EIRM	Environmental Impact & Risk Management		
	BPCA	Building Planning & Computer-Aided Drawing	EM	Environmental Management		
	GB	Green Building	UTP	Urban Transportation Planning		
	FSB	Fundamental of Soil Behaviour	ITS	Intelligent Transportation Systems		
	RE	Railway Engineering				
	DHE	Docks & Harbour Engineering				
EEE	OCEM	Operation control of Electric Machines	AES	Alternative Energy Sources	MAI	Methods & Algorithms for Intelligent Control
	FPE	Fundamentals of Power Electronics	EPGDS	Electric Power Generation & Distribution Systems	HEV	Hybrid Electric Vehicles
	EMI	Electrical Measurements & Instrumentation	UEE	Utilization of Electrical Energy	SEM	Special Electric Machines
ME	BME	Basic Mechanical Engineering	ETD	Engineering Thermodynamics	TOM	Theory of Machines
			IAE	Introduction to Automobile Engineering	AEM	Advanced Engineering Metrology
	FC	Fundamentals of Communications	MOS	Mechanics of Solids		
			HPE	Heat Power Engineering		
			PT	Production Technology		
			MMS	Metallurgy & Material Science		
			R&AC	Refrigeration & Air Conditioning		
			ADC	Analog & Digital Circuits		
			LDIC	Linear & Digital IC Applications	IIT	Introduction to Internet of things
			SA	Sensors & Actuators		
ECE	FSP	Fundamentals of Signal Processing	EM	Embedded Microcontrollers	MWC	Modern Wireless Communications
			DSD	Digital System Design		
			WLAN & PAN	Wireless LANS & PANS		
CSE			SE	Software Engineering	AMSD	Advanced MERN Stack Development
			OOP	Object Oriented Programming through C++		
			OS	Operating Systems	FF	Flutter Fundamentals
			CN	Computer Networks		
			JP	Java Programming		
			IMSD	Introduction to MERN Stack Development		
			ISA	Information Security Analysis and Audit		
DM	Data Mining					

		DM Data Mining	SNA Social Network Analysis
		FDS Fundamentals of Data Science	DV Data Visualization
		SE Software Engineering	BDA Big Data Analytics
DS		NSQL NoSQL Databases	SNSW Social Networks and Semantic Web
		BIA Business Intelligence & Analytics	
		HCDA Health Care Data Analysis	
		ML Machine Learning	DV Data Visualization
		AI Artificial Intelligence	PEG Prompt Engineering and GenAI
AIML		AI C AI Chatbot	SNA Social Network Analysis
		FDS Fundamentals of Data Science	FML Federated Machine Learning
		SC Soft Computing	NLP Natural Language Processing
	DMD Development of Mineral Deposits	SM Surface Mining	MLGS Mine Legislation and General Safety
Min.E	GM Green Mining	UCMT Underground Coal Mining Technology	EPC Environmental Pollution & Control
		UMM Underground Metal Mining Technology	ISP Industrial Safety Practices
		DB Drilling & Blasting	GC Ground Control
	IPE Introduction to Petroleum Engineering	FGRE Fundamentals of Geology and Reservoir Engineering	PRE Petroleum Refinery Engineering
PT	UOPI Unit operations in Petroleum Industry	FDPE Fundamentals of Drilling and Production Engineering	FLNG Fundamentals of Liquefied Natural Gas
		UHR Unconventional Hydrocarbon Resources	NGH Natural Gas Hydrates
	GWH Ground Water Hydrology	LWM Land and Water Management	ALT Artificial Lift Techniques
	PHEC Post-harvest Engineering of Cereal Crops	SWH Surface Water Hydrology	EOR Enhanced Oil Recovery
Ag.E		MIE Micro Irrigation Systems	DBS Design of Bio-Energy Systems
	FRES Fundamentals of Renewable Energy Sources		PHEH Post-Harvest Engineering for Horticultural Produce
	NPD New Product Development	ESB Entrepreneurship and Small Business Management	AME Agricultural Machinery and Equipment
EDC		CIM Change & Innovations Management	APEF Agriculture Process Engineering and Food Quality
		PFP Personal Financial Planning	Q Quality
		EBM E-Business Management	BPS Business Policy & Strategic Management
		IRM	GM Green Marketing
		Major Core Courses (MCC)	SM Startup Management
			VM Venture Management

Course Code	Course Name	Level	L	T	P	C	CI E	SE E	Total	Pre-requisite
241MA001	Linear Algebra & Calculus	FC	2	1		3	50	50	100	-
241MA002	Differential Equations & Vector Calculus	FC	2	1		3	50	50	100	-
241MA003	Integral Transforms & Applications of Partial Differential Equations	IC	2	1		3	50	50	100	LAC
241MA004	Numerical Methods & Statistical Techniques	IC	2	1		3	50	50	100	ITAPDE
241PH001	Solid State Physics	FC	2		1	3	50	50	100	-
241CH001	Engineering Chemistry	FC	2		1	3	50	50	100	-
241IT001	IT & AI Skills	FC			2	2	50	50	100	-
241ME003	Engineering Workshop	FC			1	1	100		100	-
241ME001	Engineering Graphics	FC	1		2	3	50	50	100	-
241ME002	Engineering Mechanics	FC	2	1	1	4	50	50	100	-
241CE001	Construction Materials & Concrete Technology	FC	2		2	4	50	50	100	-
241CE002	Fluid Mechanics	IC	1	1	1	3	50	50	100	-
241CE003	Strength of Materials – I	IC	2		2	4	50	50	100	EM
241CE004	Engineering Geology	IC	2		1	3	50	50	100	-
241CE005	Geomatics Engineering	IC	1	1	2	4	50	50	100	-
241CE006	Hydraulics & Hydraulic Machinery	IC	1	1	1	3	50	50	100	FM
241CE007	Geotechnical Engineering – I	IC	2		2	4	50	50	100	-
241CE008	Strength of Materials – II	IC	2	1		3	50	50	100	SOM-1
241CE009	Structural Analysis	IC	2	1		3	50	50	100	SOM-1
241CE010	Geotechnical Engineering – II	IC	2	1		3	50	50	100	GE-1
241CE011	Environmental Engineering	IC	2		2	4	50	50	100	-
241CE012	Transportation Engineering	IC	1	1	1	3	50	50	100	-
241CE013	Estimating and Costing	IC	3			3	50	50	100	BP&CAD
241CE014	Design of Reinforced Concrete Elements	AC	2	1		3	50	50	100	SOM

241CE024	Design of Steel Structures	AC	2	1		3	50	50	100	SOM
241CE015	Hydrology & Irrigation with ML Techniques	AC	2	1		3	50	50	100	HHM
Total			49	6	26	81				