B. TECH. FOUR YEAR DEGREE

PROGRAM CURRICULUM

(Applicable for the batches admitted from A.Y 2025-26)

CIVIL ENGINEERING

ADITYA UNIVERSITY

Aditya Nagar, ADB Road, Surampalem - 533 437

ADITYA UNIVERSITY

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.

ADITYA UNIVERSITY

Department of Civil Engineering

PEOs and PSOs of the Undergraduate Program

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 – 2025

(Applicable for the students admitted from A.Y 2025-26)

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	3
7	Summer Internships (SI)	2-4	4
8	Full Semester Internship (PROJ)	12	12
9	Mandatory Courses(MC)	0	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	CIE	SEE	Total	Pre-requisite
2501MA01	Linear Algebra & Calculus	FC	2	1		3	50	50	100	-
2501MA02	Differential Equations & Vector Calculus	FC	2	1		3	50	50	100	-
2501MA03	Integral Transforms & Applications of Partial Differential Equations	IC	2	1		3	50	50	100	LAC
2501MA04	Numerical Methods & Statistical Techniques	IC	2	1		3	50	50	100	ITAPDE
2501PH01	Solid State Physics	FC	2		1	3	50	50	100	-
2501CH01	Engineering Chemistry	FC	2		1	3	50	50	100	-
2501IT01	Business Intelligence Lab	FC			2	2	50	50	100	-
2501ME03	Engineering Workshop	FC			1	1	100		100	-
2501ME01	Engineering Graphics	FC	1		2	3	50	50	100	-
2501ME02	Engineering Mechanics	FC	2	1	1	4	50	50	100	-
2501CE01	Construction Materials & Concrete Technology	IC	2		2	4	50	50	100	-
2501CE02	Fluid Mechanics	IC	1	1	1	3	50	50	100	-
2501CE03	Strength of Materials – I	IC	2		2	4	50	50	100	EM
2501CE04	Engineering Geology	IC	2		1	3	50	50	100	-
2501CE05	Geomatics Engineering	FC	1	1	2	4	50	50	100	-
2501CE06	Hydraulics & Hydraulic Machinery	IC	1	1	1	3	50	50	100	FM

2501CE07	Geotechnical Engineering – I	IC	2		2	4	50	50	100	-
2501CE08	Strength of Materials – II	IC	2	1		3	50	50	100	SOM-1
2501CE09	Structural Analysis	IC	2	1		3	50	50	100	SOM-1
2501CE10	Geotechnical Engineering – II	IC	2	1		3	50	50	100	GE-1
2501CE11	Environmental Engineering	IC	2		2	4	50	50	100	-
2501CE12	Transportation Engineering	IC	1	1	1	3	50	50	100	-
2501CE13	Estimating and Costing	IC	3			3	50	50	100	BP&CAD
2501CE14	Design of Reinforced Concrete Elements	AC	2	1		3	50	50	100	SOM
2501CE24	Design of Steel Structures	AC	2	1		3	50	50	100	SOM
2501CE15	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
2501CS01	Programming for Problem Solving Using C	FC	2		2	4	50	50	100	-
2501EE01	Basic Electrical & Electronics Engineering	FC	2		2	4	50	50	100	-
2501MB01	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
2501EN01	Essential Cognitive Skills for Engineers	FC			1	1	100	-	100	-
2501EN02 2501UC05 2501UC04 2501UC06 2501UC03	Advanced Cognitive Skills for Engineers (or) Proficiency in Foreign Language (Japanese/German/ Spanish/ French)	FC			1	1	100	-	100	CEE
2501UC07	Design Thinking using AI	FC			1	1	100	-	100	-
2501UC08	Universal Human Values	FC	2			2	100	-	100	-
2501UC09	Technical Paper Publication	AC			2	2	100	-	100	-
2501CE79	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
2501CE43	Building Planning & Computer Aided Drawing	FC			2	2	50	50	100	-
2501CE17	3D Modelling of Building	FC			2	2	50	50	100	EG
2501CE18	Geospatial AI	IC			1	1	100	-	100	-
2501CE19	GeoStudio for Geotechnical Applications	AC			2	2	50	50	100	GT-1, GT-2
2501CE20	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
2501UC11	Employability Skills - I	FC			3	0	100	-	100	-
2501UC13	Employability Skills – II	FC			3	0	100	-	100	ES-I
2501UC14	Employability Skills – III	IC			3	0	100	-	100	ES-II
2501UC15	Employability Skills – IV	IC			3	0	100	-	100	ES-III
2501UC16	Employability Skills - V	AC			3	1	100	-	100	ES-IV
2501CS02	Data Analysis using Python	IC			2	2	50	50	100	PPSC
Total					**17**	**3**				

Summer Internships (SI)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501CE21	Summer Internship - I	IC			2	2	100	-	100	-
2501CE22	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
2501CE23	Full Semester Internship	AC			12	12	50	50	100	-
Total					**12**	**12**				

Mandatory Courses (MC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501AC01	Environmental Science	FC	2			0	100	-	100	-
2501AC02	Constitution of India	FC	2			0	100	-	100	-
2501AC03	Research Methodology	FC	2			0	100	-	100	-
2501AC04	Intellectual Property Rights & Patents	FC	2			0	100	-	100	-
2501AC05	Indian Knowledge Systems	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
2501CE57	Construction & Project Management	FC	2			2	50	50	100	--
2501CE25	Repair & Rehabilitation of Structures	FC	3			3	50	50	100	-
2501CE26	Fire & Safety Engineering	FC	3			3	50	50	100	-
2501CE27	Green Buildings	FC	3			3	50	50	100	-
2501CE29	Construction Equipment & Machinery	FC	3			3	50	50	100	CM&CT
2501CE28	Finite Element Methods	IC	2	1		3	50	50	100	SA
2501CE31	Construction Contract Management	IC	3			3	50	50	100	-
2501CE30	Pre-stressed Concrete Structures	IC	3			3	50	50	100	-
2501CE32	Design of Ocean Structures & Foundation	IC	2	1		3	50	50	100	-
2501CE33	Analysis & Design of Masonry Structures	IC	2	1		3	50	50	100	-
2501CE34	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
2501CE41	Geoenvironmental Engineering	FC	2			2	50	50	100	ES
2501CE40	Fundamentals of Soil Behaviour	FC	2	1		3	50	50	100	-
2501CE39	Flow & Transport in Porous Media	FC	3			3	50	50	100	-
2501CE44	Land fill Engineering & Remediation Technology	FC	3			3	50	50	100	-
2501CE36	Environmental Impact & Risk Management	FC	3			3	50	50	100	-
2501CE35	Climate Change and Environmental Issues	IC	3			3	50	50	100	-
2501CE42	Ground Improvement Techniques	IC	3			3	50	50	100	GTE-2
2501CE38	Expansive Soils	IC	3			3	50	50	100	GTE-1&2
2501CE37	Environmental Management	IC	3			3	50	50	100	-
2501CE45	Marine Foundations	AC	3			3	50	50	100	GTE-2
2501CE73	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
2501CE53	Pavement Materials & Characterization	FC	2			2	50	50	100	-
2501CE47	Docks & Harbour Engineering	FC	3			3	50	50	100	-
2501CE54	Railway Engineering	FC	3			3	50	50	100	-
2501CE55	Road Safety Analysis	FC	3			3	50	50	100	-
2501CE48	Highway Construction & Practices	FC	3			3	50	50	100	-
2501CE52	Pavement Management Systems	FC	3			3	50	50	100	-
2501CE51	Pavement Drainage Systems	FC	3			3	50	50	100	-
2501CE46	Airport Planning & Design	IC	3			3	50	50	100	-
2501CE56	Urban Transportation Planning	IC	3			3	50	50	100	-
2501CE49	Intelligent Transportation Systems	AC	3			3	50	50	100	-
2501CE50	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
2501CE69	Building Information Modelling in Construction	FC			3	3	50	50	100	-
2501CE67	Sustainability Practices in Design of Buildings	IC			3	3	50	50	100	-
2501CE70	Formwork Engineering Practices	IC			2	2	50	50	100	-
2501CE72	Design & Execution of Pile Foundations	IC			3	3	50	50	100	-
2501CE61	Metro Rail Transportation Systems & Construction	IC			3	3	50	50	100	-
2501CE71	Deep Excavations, Foundations & Tunnels	AC			3	3	50	50	100	-
2501CE68	Bridge Engineering Design Practices	AC			3	3	50	50	100	-
2501CE16	Geospatial Techniques in Practice	AC			3	3	50	50	100	-
2501CE63	Pre Engineered Buildings	AC			3	3	50	50	100	-
2501CE64	Precast Members & Construction	AC			3	3	50	50	100	-
2501CE60	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**
2501AI02	Artificial Intelligence	FC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	DAP
2501AI05	Machine Learning	FC	2		2	4	50	50	100	CE,EEE,ME, ECE, PT,Min.E	DAP
2501AI27	AI & Data Science	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	DAP
2501AI28	AI in Healthcare	IC	2		1	3	50	50	100	CE,EEE, ME, ECE,CSE, IT, AIML,CSE (DS) PT,Min.E	DAP
2501AI11	Deep Learning	IC	2		2	4	50	50	100	CE,EEE,ME, ECE, PT,Min.E	DAP
2501AI10	Natural Language Processing	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	DAP
2501AI09	Reinforcement Learning	AC	1		2	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	DAP
2501AI29	AI in Agriculture	AC	2		1	3	50	50	100	CE,EEE,ME, ECE,CSE,IT, AIML,CSE (DS) PT,Min.E	DAP
2501AI30	Robotics & AI	AC	2		1	3	50	50	100	CE,EEE,ME,	DAP

										ECE,CSE,IT, AIML,CSE (DS) PT,Min.E	
2501AI31	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			**19**		**13**	**32**					

Production Excellence											
Course Code	**Course Name**	**Level**	**L**	**T**	**P**	**C**	**CIE**	**SEE**	**Total**	**Offered to Programs**	**Pre-requisite**
2501ME81	Fundamentals of Production Excellence	FC	2			2	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML,CSE(DS) PT,Min.E	-
2501ME82	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
2501ME83	Quality Excellence in Production	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE
2501ME84	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
2501ME85	Agile Production Systems	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE

2501ME86	Process Excellence & Optimization	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	FPE
2501ME87	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
2501ME88	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
2501ME89	Data-Driven Decision Making for Production Excellence	AC	2		1	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,MinE	FPE
2501ME58	Industry 5.0 for Engineers	AC	3			3	50	50	100	CE,EEE, ECE, CSE,IT, AIML, CSE(DS) PT,MinE	FPE
2501ME90	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**
2501MB17	Introduction to Supply Chain Management	FC	2			2	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML,CSE(DS) PT,Min.E	-
2501MB18	Logistics & Distribution Management	FC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM

2501MB19	Supply Chain Project Management	IC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
2501MB20	Supply Chain Innovation &Trends	IC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
2501MB21	Supply Chain Analytics	IC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
2501MB22	Demand Planning & Forecasting	IC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
2501MB23	Supply Chain Risk Management	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
2501MB24	Inventory Management & Control	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
2501MB25	E-Commerce & Supply Chain Management	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
2501MB26	Operations Management	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	ISCM
2501MB27	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**
2501CE74	Introduction to Sustainable Development	FC	2			2	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML,CSE(DS) PT,Min.E	-
2501CE66	Natural Disaster Management & Mitigation	FC	3			3	50	50	100	EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501CE81	Waste Water Management	IC	3			3	50	50	100	EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501CE82	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	-
2501CE83	Watershed Management	IC	3			3	50	50	100	EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501EE33	Energy Audit, Conservation & Management	IC	3			3	50	50	100	CE, ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	BEEE

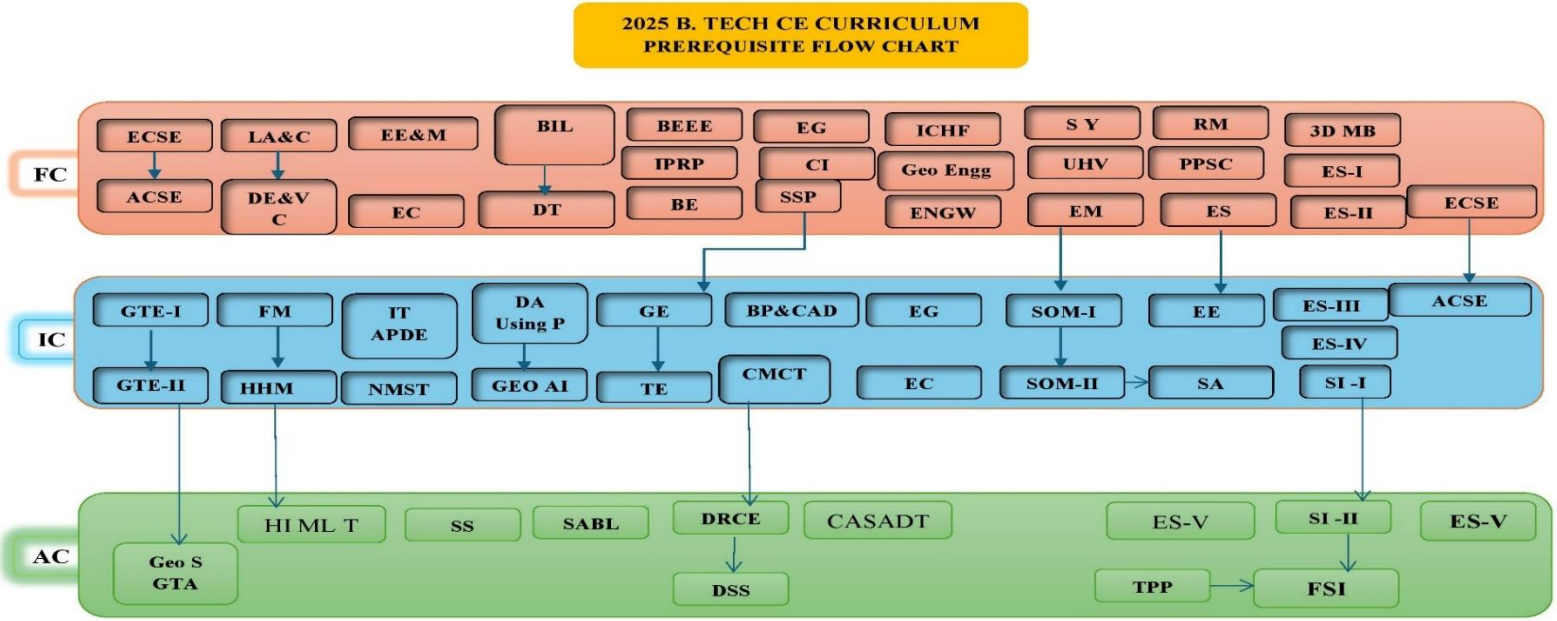
2501EE06	Electric Power Generation, Transmission & Distribution Systems	AC	3			3	50	50	100	CE, ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	BEEE
2501CE75	Sustainable Agriculture & Food Systems	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501CE76	Sustainable Supply Chain Management	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501CE77	Sustainable Production Excellence	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501CE78	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**
2501CS32	Cybersecurity Essentials	FC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501IT35	Security in Software Development	FC	3			3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501CS28	Ethical Hacking	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501CS69	Cloud Security	IC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501IT36	Security &Compliance in Business	IC	3			3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501IT37	Cryptography & Data Security	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501IT38	Security Awareness & Social Engineering	AC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501IT39	Cybersecurity Policy & Strategy	AC	3			3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501IT40	Security in Emerging Technologies	AC	3			3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501CS30	Information Security Analysis & Audit	AC	2			2	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501IT41	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**
2501CE80	Remote Sensing & GIS Applications	FC	3			3	50	50	100	EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501EE36	Electric Energy Storage Systems	FC	3			3	50	50	100	CE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	BEEE
2501EE43	Electrical safety	IC	3			3	50	50	100	CE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	BEEE
2501EE54	Hybrid & Electric Vehicles	IC	3			3	50	50	100	CE, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	BEEE
2501ME73	Organizational Behaviour	FC	3			3	50	50	100	CE,EEE, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501ME36	Sustainable Energy Systems	FC	3			3	50	50	100	CE, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501ME37	Solar Energy Systems	FC	3			3	50	50	100	CE,EEE,ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501ME60	Composite Materials	IC	3			3	50	50	100	CE,EEE,ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	SSP/MP
2501EC82	Communication Systems	FC	3			3	50	50	100	CE,EEE,ME,CSE ,IT, AIML, CSE(DS) PT,Min.E	-

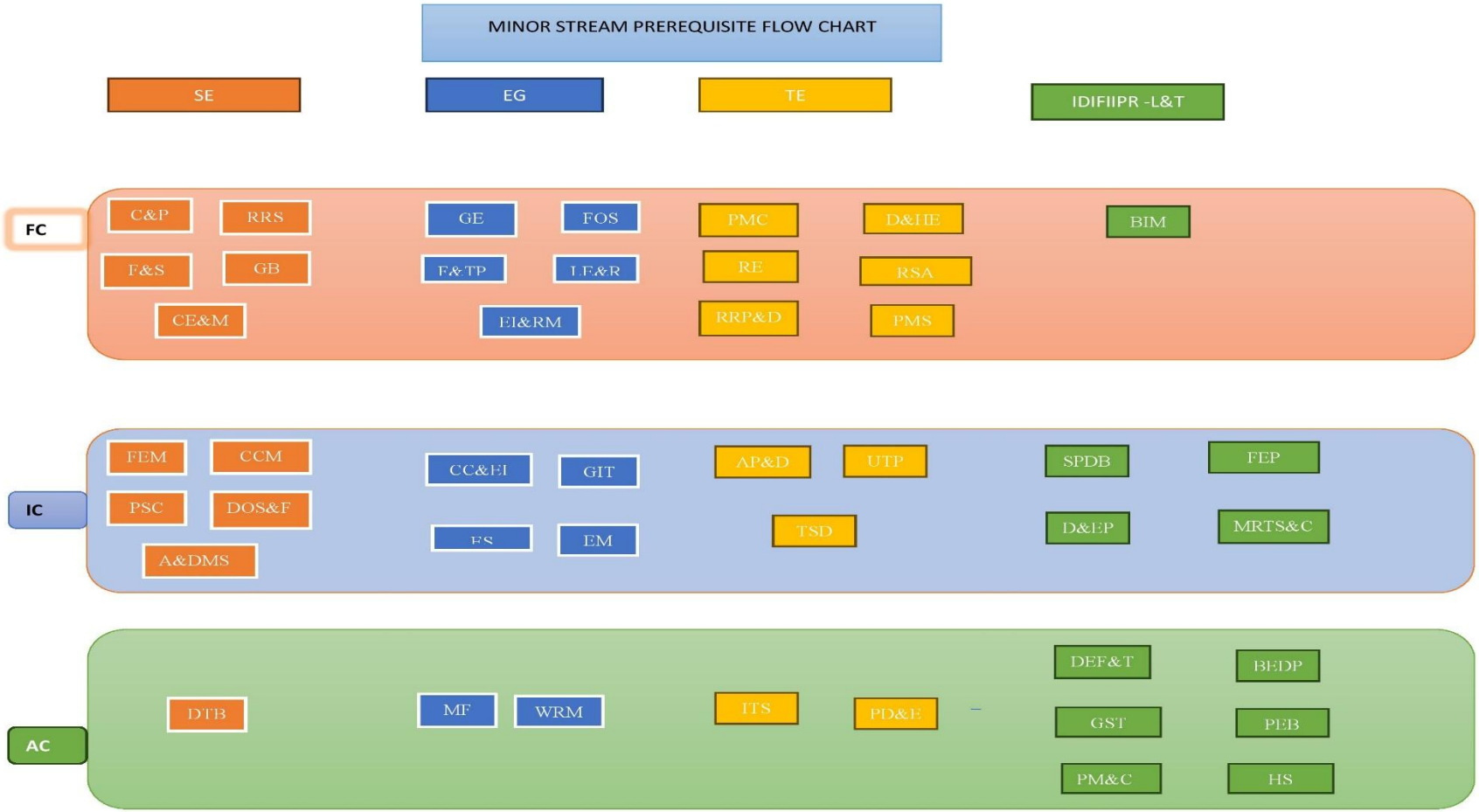
2501EC83	Electronic Measurements & Instrumentation	FC	3			3	50	50	100	CE,EEE,ME, CSE,IT, AIML, CSE(DS) PT,Min.E	BEEE
2501EC84	Introduction to Embedded Systems	FC	3			3	50	50	100	CE,EEE,ME, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501EC85	Fundamentals of Image Processing	FC	3			3	50	50	100	CE,EEE,ME, CSE,IT, AIML, CSE(DS) PT,Min.E	
2501EC77	Sensors and Transducers	IC	3			3	50	50	100	CE,EEE,ME, CSE,IT, AIML, CSE(DS) PT,Min.E	
2501CS03	Data Structures	FC	2		2	4	50	50	100	CE,EEE,ME, ECE, PT,Min.E	PPSC
2501CS65	Computer Organization	FC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501CS13	Operating Systems	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501IT05	Database Management Systems	IC	2		2	4	50	50	100	CE,EEE,ME, ECE, PT,Min.E	PPSC
2501IT07	Agile Software Engineering	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	PPSC
2501CS07	Computer Networks	IC	2		1	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501IT06	Java Programming	IC	2		2	4	50	50	100	CE,EEE,ME, ECE, PT,Min.E	PPSC
2501CS68	Fundamentals of RedHat Enterprise Linux	FC			2	2	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501CS67	AWS Cloud Foundations	IC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501CS66	AWS Cloud Development	AC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501CS70	Continuous integration & delivery using DevOps	AC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-

2501IT24	Fundamentals of Salesforce Administration	FC			2	2	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501IT34	Advanced Salesforce Administration	AC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501IT23	Principles of Pega Systems	IC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501IT26	Pega System Architecture & Design	AC			3	3	50	50	100	CE,EEE,ME, ECE, PT,Min.E	-
2501MB04	Entrepreneurship Development & Incubation	IC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501MB05	Business Ethics & Corporate Governance	AC	3			3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501MB06	Entrepreneurship Development & Business Management	AC	1		2	3	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501EC29	SoC Design	AC	3			3	50	50	100	CE, EEE, ME, CSE, IT, AIML, CSE (DS), PT, Min.E.	MPMC
2501CS23	Cloud Computing	FC	2		2	4	50	50	100	CE, EEE, ME, ECE, PT, Min.E.	-


2025 B. TECH CE CURRICULUM
PREREQUISITE FLOW CHART
FC
ECSE
LA&C
EE&M
BIL
BEEE
EG
ICHF
S Y
RM
3D MB
IPRP
CI
Geo Engg
UHV
PPSC
ES-I
ACSE
DE&V C
EC
DT
BE
SSP
ENGW
EM
ES
ES-II
ECSE
IC
GTE-I
FM
IT APDE
DA Using P
GE
BP&CAD
EG
SOM-I
EE
ES-III
ACSE
ES-IV
GTE-II
HHM
NMST
GEO AI
TE
CMCT
EC
SOM-II
SA
SI -I
AC
Geo S GTA
HI ML T
SS
SABL
DRCE
CASADT
ES-V
SI -II
ES-V
DSS
TPP
FSI

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	CMCT	Construction Materials & Concrete Technology	CASAD	Computer Aided Structural Analysis & Design
GE	Geomatic Engineering	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-1	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 using AI	EE	Environmental Engineering		
IT AI	Business Intelligence Lab	TE	Transportation Engineering		
ENGW	Engineering Workshop	ESC	Estimating and Costing		

ES	Environmental Science	ACSE-1	Advanced Cognitive Skills for Engineers
CI	Constitution of India	DAP	Data Analysis Using Python
IKS	Indian Knowledge Systems	GEO AI	Geospatial AI
RM	Research Methodology	SI	Summer Internship
IPRP	Intellectual Property Rights & Patents	ES-III	Employability Skills -III
BE	Biology for Engineers	ES-IV	Employability Skills -IV
EEM	Engineering Economics & Management		
ES-I	Employability Skills -I		
ES-II	Employability Skills -II		


MINOR STREAM PREREQUISITE FLOW CHART
SE
EG
TE
IDIFIIPR -L&T
FC
C&P
RRS
GE
FOS
PMC
D&HE
BIM
F&S
GB
F&TP
LE&R
RE
RSA
CE&M
EI&RM
RRP&D
PMS
IC
FEM
CCM
CC&EI
GIT
AP&D
UTP
SPDB
FEP
PSC
DOS&F
TSD
D&EP
MRTS&C
A&DMS
EM
AC
DTB
MF
WRM
ITS
PD&E
DEF&T
BEDP
GST
PEB
PM&C
HS

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		
			ES	Expansive Soil		
	FTPM	Flow & Transport in Porous Media	EM	Environmental Management	EBT	Water Resource Management
	LERT	Land fill Engineering & Remediation Technology				
	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				
	PMS	Pavement Management Systems				
	PDS	Pavement Drainage System				
IDIFII L&T	BIMC	Building Information Modelling in Construction	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
			MRTS&C	Metro Rail Transportation System & Construction	PMC	Precast Members & Construction
					HPS	Hydropower Systems
					GTP	Geospatial Techniques in Practices

Suggestive Semester-wise Curriculum

I SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
2501MA01	Linear Algebra & Calculus	MCC	FC	2	1	–	3	3
2501PH01	Solid State Physics	MCC	FC	2	–	1	3	4
2501ME01	Engineering Graphics	MCC	FC	1	–	2	3	5
2501IT01	Business Intelligence Lab	MCC	FC	–	–	2	2	4
2501EN01	Essential Cognitive Skills for Engineers	AEC	FC	–	–	1	1	2
2501ME03	Engineering Workshop	MCC	FC	–	–	1	1	2
2501UC07	Design Thinking using AI	AEC	FC	–	–	1	1	2
2501CE05	Geomatics Engineering	MCC	FC	1	1	2	4	6
2501MB01	Engineering Economics & Management	MDC	FC	2	–	–	2	2
	Total			**8**	**2**	**11**	**20**	**30**

II SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
2501MA02	Differential Equations & Vector Calculus	MCC	FC	2	1	–	3	3
2501CH01	Engineering Chemistry	MCC	FC	2	–	1	3	4
2501EE01	Basic Electrical & Electronics Engineering	MDC	FC	2	–	2	4	6
2501ME02	Engineering Mechanics	MCC	FC	2	1	1	4	5
2501CS01	Programming for Problem Solving Using C	MDC	FC	2	–	2	4	6
2501EN02	Advanced Cognitive Skills for Engineers	AEC	FC	–	–	1	1	2
2501UC08	Universal Human Values	AEC	FC	2	–	–	2	2
2501UC11	Employability Skills-I	VAC	FC	–	–	3	–	3
2501AC01	Environmental Science	MC	FC	2	–	–	–	2
	Total			**14**	**2**	**10**	**21**	**33**

III SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
2501MA03	Integral Transforms & Applications of Partial Differential Equations	MCC	IC	2	1	–	3	3
2501CE03	Strength of Materials – I	MCC	IC	2	–	2	4	6
2501CE04	Engineering Geology	MCC	IC	2		1	3	4
2501CE02	Fluid Mechanics	MCC	IC	1	1	1	3	4
2501CE01	Construction Materials & Concrete Technology	MCC	IC	2	–	2	4	6
2501CE43	Building Planning & Computer Aided Drawing	SEC	IC	–	–	2	2	4
2501UC13	Employability Skills-II	VAC	FC	–	–	3	0	3
2501AC02	Constitution of India	MC	FC	2	–	–	0	2
	Total			**11**	**2**	**11**	**19**	**32**

IV SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
2501MA04	Numerical Methods & Statistical Techniques	MCC	IC	2	1	–	3	3
2501CE06	Hydraulics & Hydraulic Machinery	MCC	IC	1	1	1	3	4
2501CE08	Strength of Materials – II	MCC	IC	2	1	–	3	3
2501CE07	Geotechnical Engineering – I	MCC	IC	2	–	2	4	6
2501CE09	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
2501CE17	3D-Modeling of Buildings	SEC	FC	–	–	2	2	4
2501CS02	Data Analysis Using Python	VAC	IC	–	–	2	2	4
2501UC14	Employability Skills-III	VAC	IC	–	–	3	0	3
2501AC03	Research Methodology	MC	FC	2	–	–	0	2
	Total			**13**	**4**	**10**	**22**	**34**

V SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
2501CE14	Design of Reinforced Concrete Elements	MCC	AC	2	1	–	3	3
2501CE10	Geotechnical Engineering – II	MCC	IC	2	1	–	3	3
2501CE12	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
2501CE20	Computer-Aided Structural Analysis & Design	SEC	AC	–	–	2	2	4
2501UC15	Employability Skills-IV	VAC	IC	–	–	3	0	3*
2501CE21	Summer Internship- 1	SI	IC	–	–	2	2	4
2501AC04	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	
2501CE24	Design of Steel Structures	MCC	AC	2	1	–	3	3
2501CE15	Hydrology & Irrigation with ML Techniques	MCC	AC	2	1	–	3	3
2501CE11	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
2501CE18	Geospatial AI	SEC	IC	–	–	1	1	2
2501AC05	Indian Knowledge Systems	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	
2501CE13	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
2501CE19	GeoStudio for Geotechnical Applications	SEC	AC	–	–	2	2	4
2501CE22	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	
2501UC09	Technical Paper Publication	AEC	AC			2	2	4
2501UC16	Employability Skills-V	VAC	AC			3	1	3*
2501CE23	Full Semester Internship	PROJ	AC			12	12	24
2501CE79	Student Activity Based Learning	AEC	AC				2	
	Total					**17**	**17**	**33**

Total Credit:160

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

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501CE25	Repair & Rehabilitation of Structures	FC	3	–	–	3	50	50	100	-
2501CE43	Building Planning & Computer-Aided Drawing	FC	–	–	2	2	50	50	100	-
2501CE27	Green Buildings	FC	3	–	–	3	50	50	100	-
2501CE40	Fundamentals of Soil Behaviour	FC	2	1		3	50	50	100	-
2501CE54 2501CE47	Railway Engineering (or) Docks & Harbour Engineering	FC	3	–	–	3	50	50	100	-
2501CE36 2501CE37	Environmental Impact & Risk Management (or) Environmental Management	IC	3	–	–	3	50	50	100	-
2501CE56 2501CE49	Urban Transportation Planning (or) Intelligent Transportation Systems	IC	3	–	–	3	50	50	100	-
Total			**17**	**1**	**2**	**20**				

Minor Degree in Electrical and Electronics Engineering

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501EE55	Operation &Control of Electric machines	FC	2	–	–	2	50	50	100	BEEE
2501EE56	Fundamentals of Power Electronics	FC	2	–	–	2	50	50	100	BEEE
2501EE13	Electrical Measurements & Instrumentation	FC	2	1	1	4	50	50	100	ENA-1/BEEE
2501EE53	Electric Power Generation, Transmission and Distribution Systems	IC	3	–	–	3	50	50	100	ENA-1/BEEE
2501EE34 2501EE27	Alternative Energy Sources (or) Utilization of Electrical Energy	IC	3	–	–	3	50	50	100	EPGDS / BEEE/ ISM
2501EE37 2501EE35	Hybrid Electric Vehicles (or) Special Electric machines	AC	3	–	–	3	50	50	100	FPE/ OCEM
2501EE43 2501EE30	Electrical Safety (or) Methods &Algorithms for Intelligent Control	AC	3	–	–	3	50	50	100	EPGDS/PSA
	Total		**18**	**1**	**1**	**20**				

Minor Degree in Mechanical Engineering

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501ME74	Basic Mechanical Engineering	FC	2	–	–	2	50	50	100	-
2501ME04	Engineering Thermodynamics	IC	2	1	–	3	50	50	100	SSP/ MP
2501ME77	Introduction to Automobile Engineering (or)	IC	3	–	–	3	50	50	100	SSP/ MP
2501ME78	Mechanics of Solids									
2501ME12	Heat Power Engineering (or)	IC	2	1	–	3	50	50	100	ETD
2501ME40	Refrigeration & Air Conditioning									
2501ME75	Production Technology	IC	3	–	–	3	50	50	100	EW
2501ME76	Metallurgy & Material Science	IC	3	–	–	3	50	50	100	SSP/ MP
2501ME79	Theory of Machines (or)	AC	3	–	–	3	50	50	100	SSP/ MP
2501ME80	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
2501EC87	Fundamentals of Communications	FC	2	—	1	3	50	50	100	-
2501EC88	Fundamentals of Signal Processing	FC	2	—	1	3	50	50	100	-
2501EC89	Analog & Digital Circuits	IC	2	—	—	2	50	50	100	BEEE
2501EC42	Wireless LAN's & PAN's	IC	2	1	—	3	50	50	100	-
2501EC90	Linear & Digital IC Applications (or) Sensors & Actuators	IC	3	—	—	3	50	50	100	ADC
2501EC91										
2501EC92	Embedded Microcontrollers (or) Digital System Design	IC	2	—	1	3	50	50	100	ADC, PPSC
2501EC93										
2501EC67	Introduction to Internet of things (or) Modern Wireless Communications	AC	2	—	1	3	50	50	100	EM, WLAN's& PAN's
2501EC74			3	—		3	50	50	100	FC
Total			**15**	**1**	**4**	**20**				

Minor Degree in Computer Science and Engineering

Course Code	Course Title	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501CS13	Operating Systems	IC	2	–	1	3	50	50	100	-
2501CS07	Computer Networks	IC	2	–	1	3	50	50	100	-
2501IT07	Agile Software Engineering	IC	2	–	1	3	50	50	100	PPSC
2501AI03	Data Mining	IC	1	–	2	3	50	50	100	-
2501CS08 2501IT06	Object Oriented Programming through C++ (or) Java Programming	IC	2	–	2	4	50	50	100	PPSC
2501CS16	Introduction to MERN Stack Development (or) Information Security Analysis & Audit	IC	–	–	2	2	50	50	100	JP
2501CS30		IC	2	–		2	50	50	100	-
2501CS18	Advanced MERN Stack Development (or) Flutter Fundamentals	AC	–	–	2	2	50	50	100	IMSD
2501IT12		AC	–	–	2	2	50	50	100	-
Total			**11**		**11**	**20**				

Minor Degree in Data Science

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501IT07	Agile Software Engineering	IC	2	—	1	3	50	50	100	PPSC
2501CS34	Fundamentals of Data Science	IC	2	—	1	3	50	50	100	PPSC
2501CS12	NoSQL Databases	IC	2	—		2	50	50	100	-
2501AI03	Data Mining	IC	1	—	2	3	50	50	100	-
2501CS37 2501CS36	Health Care Data Analytics (or) Business Intelligence & Analytics	IC	2	—	1	3	50	50	100	PPSC
2501AI04 2501AI19	Big Data Analytics (or) Data Visualization	AC	2	—	1	3	50	50	100	DM DAP
2501CS41 2501CS40	Social Network Analysis (or) Social Networks & Semantic Web	AC	2	—	1	3	50	50	100	-
	Total		**13**		**7**	**20**				

Minor Degree in Artificial Intelligence and Machine Learning

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501AI02	Artificial Intelligence	IC	2	–	1	3	50	50	100	DAP
2501AI05	Machine Learning	IC	2	–	2	4	50	50	100	DAP
2501AI15	AI Chatbots	IC	2	–		2	50	50	100	DAP
2501AI14	Soft Computing (or) Fundamentals of Data Science	IC	1	–	2	3	50	50	100	AI
2501CS34			2	–	1	3	50	50	100	PPSC
2501AI10	Natural Language Processing (or) Data Visualization	AC	2	–	1	3	50	50	100	DAP
2501AI19										
2501AI16	Prompt Engineering and GenAI (or) Social Network Analysis	AC	2	–	1	3	50	50	100	ML
2501CS41										
2501AI17	Federated Machine Learning	AC	2	–	–	2	50	50	100	ML
TOTAL			**14**		**6**	**20**				

Minor Degree in Petroleum Technology

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501PT27	Introduction to Petroleum Engineering	FC	3	—	—	3	50	50	100	-
2501PT35	Unit Operations in Petroleum Industry	FC	3	—	—	3	50	50	100	-
2501PT47	Fundamentals of Geology & Reservoir Engineering	IC	3	—	—	3	50	50	100	-
2501PT48	Fundamentals of Drilling & Production Engineering **(or)**	IC	2	—	—	2	50	50	100	-
2501PT16	Unconventional Hydrocarbon Resources		2	—	—	2				
2501PT49	Natural Gas Hydrates **(or)**	AC	2	—	—	2	50	50	100	-
2501PT05	Fundamentals of Liquefied Natural Gas		2	—	—	2				
2501PT50	Artificial Lift Techniques **(or)**	AC	3	—	—	3	50	50	100	-
2501PT03	Enhanced Oil Recovery		2	1	—	3				
2501PT12	Petroleum Refinery Engineering	AC	2	—	2	4	50	50	100	-
Total			**17**	**1**	**2**	**20**				

Minor Degree in Mining Engineering

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501MN03	Development of Mineral Deposits	FC	3	—	—	3	50	50	100	-
2501MN41	Green Mining	FC	3	—	—	3	50	50	100	-
2501MN06	Surface Mining	IC	3	—	—	3	50	50	100	DMD
2501MN24	Drilling & Blasting	IC	3	—	—	3	50	50	100	DMD
2501MN07 2501MN08	Underground Coal Mining Technology (or) Underground Metal Mining Technology	IC	3	—	—	3	50	50	100	DMD
2501MN14 2501MN28	Mine Legislation & General Safety (or) Environmental Pollution & Control	AC	3	—	—	3	50	50	100	UCMT / UMMT
2501MN45 2501MN46	Industrial Safety Practices (or) Ground Control	AC	2	—	—	2	50	50	100	-
Total			**20**			**20**				

Minor Degree in Agricultural Engineering

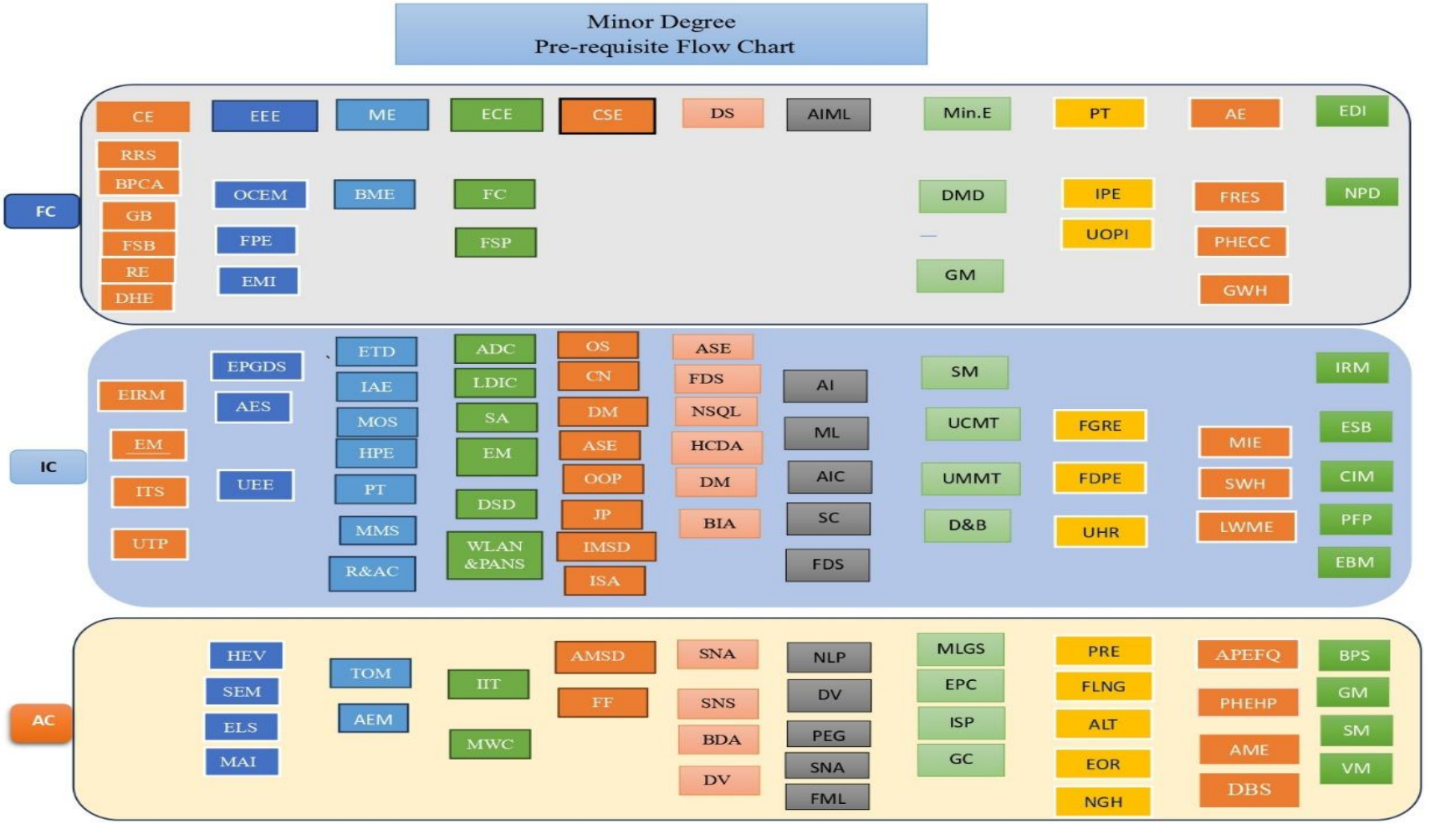
Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501AE82	Fundamentals of Renewable Energy Sources	FC	3	—	—	3	50	50	100	-
2501AE83	Post-harvest Engineering of Cereal Crops	FC	3	—	—	3	50	50	100	-
2501AE84	Ground Water Hydrology	FC	3	—	—	3	50	50	100	-
2501AE85	Micro Irrigation Systems	IC	2	—	—	2	50	50	100	-
2501AE86	Surface Water Hydrology (or) Land & Water Management Engineering	IC	3	—	—	3	50	50	100	GWH
2501AE87										
2501AE88	Agricultural Process Engineering & Food Quality (or) Post-harvest Engineering for Horticultural Proc	AC	3	—	—	3	50	50	100	PHECC
2501AE89										
2501AE90	Agricultural &Machinery Equipment (or) Design of Bio-energy systems	AC	3	0	0	3	50	50	100	FRES
2501AE91										
	Total		**20**			**20**				

Minor Degree in Entrepreneurship Development and Incubation

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501MB07	New Product Development	FC	3	—	—	3	50	50	100	-
2501MB08	Entrepreneurship & Small Business Management	IC	2	—	—	2	50	50	100	-
2501MB09	Insurance & Risk Management	IC	3	—	—	3	50	50	100	-
2501MB10	Change & Innovations Management	IC	3	—	—	3	50	50	100	-
2501MB11 2501MB12	Personal Financial Planning (or) E-Business management	IC	3	—	—	3	50	50	100	-
2501MB13 2501MB14	Business Policy & Strategic Management (or) Green Marketing	AC	3	—	—	3	50	50	100	-
2501MB15 2501MB16	Startup Management (or) Venture Management	AC	3	—	—	3	50	50	100	-
Total			**20**			**20**				

Minor Degree in Quantum Technologies

S.No.	Course Code	Course Name	L	T	P	C	Semester
Mandatory Courses							
1	251EC097	Survey of Quantum technologies and Application	3	0	0	3	IV
2	251EC098	Foundations of Quantum Technologies	3	0	0	3	V
3	251EC099	Basic Programming Lab (or)	1	0	2	3	V
	251EC100	Basic Laboratory Course for Quantum Technologies					
4	251EC101	Quantum Algorithms and Cryptography	12 week 3 Credit - NPTEL MOOC			3	VII/VIII
Any One course from the below							
5	251EC102	Introduction to Quantum Computation	3	0	0	3	VI
6	251EC103	Introduction to Quantum Communication	3	0	0	3	VI
7	251EC104	Introduction to Quantum Sensing	3	0	0	3	VI
8	251EC105	Introduction to Quantum Materials	3	0	0	3	VI
Any One course from the below							
9	251EC106	Engineering Foundations of Quantum Technologies	3	0	0	3	VII
10	251EC107	Solid State Physics for Quantum Technologies	3	0	0	3	VII
11	251EC108	Quantum Optics	3	0	0	3	VII
12	251EC109	Quantum Cybersecurity	3	0	0	3	VII
13	251EC110	Quantum Machine Learning	3	0	0	3	VII
Total			**18**	**0**	**0**	**18**	


Minor Degree
Pre-requisite Flow Chart
FC
CE
RRS
BPCA
GB
FSB
RE
DHE
EEE
OCEM
FPE
EMI
ME
BME
ECE
FC
FSP
CSE
DS
AIML
Min.E
DMD
GM
PT
IPE
UOPI
AE
FRES
PHECC
GWH
EDI
NPD
IC
EIRM
EM
ITS
UTP
EPGDS
AES
UEE
ETD
IAE
MOS
HPE
PT
MMS
R&AC
ADC
LDIC
SA
EM
DSD
WLAN &PANS
OS
CN
DM
ASE
OOP
JP
IMSD
ISA
ASE
FDS
NSQL
HCDA
DM
BIA
AI
ML
AIC
SC
FDS
SM
UCMT
UMMT
D&B
FGRE
FDPE
UHR
MIE
SWH
LWME
IRM
ESB
CIM
PFP
EBM
AC
HEV
SEM
ELS
MAI
TOM
AEM
IIT
MWC
AMSD
FF
SNA
SNS
BDA
DV
NLP
DV
PEG
SNA
FML
MLGS
EPC
ISP
GC
PRE
FLNG
ALT
EOR
NGH
APEFQ
PHEHP
AME
DBS
BPS
GM
SM
VM

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
					ELS	Electrical Safety
ME	BME	Basic Mechanical Engineering	ETD	Engineering Thermodynamics	TOM	Theory of Machines
			IAE	Introduction to Automobile Engineering	AEM	Advanced Engineering Metrology
			MOS	Mechanics of Solids		
			HPE	Heat Power Engineering		
			PT	Production Technology		
			MMS	Metallurgy & Material Science		
			R&AC	Refrigeration &Air Conditioning		
ECE	FC	Fundamentals of Communications	ADC	Analog & Digital Circuits	IIT	Introduction to Internet of things
			LDIC	Linear & Digital IC Applications		
	FSP	Fundamentals of Signal Processing	SA	Sensors & Actuators	MWC	Modern Wireless Communications
			EM	Embedded Microcontrollers		
			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
			UMMT	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
					NGH	Natural Gas Hydrates
			UHR	Unconventional Hydrocarbon Resources	ALT	Artificial Lift Techniques
					EOR	Enhanced Oil Recovery
	GWH	Ground Water Hydrology	LWME	Land and Water Management	DBS	Design of Bio-Energy Systems
	PHECC	Post-harvest Engineering of Cereal Crops	SWH	Surface Water Hydrology	PHEHP	Post-Harvest Engineering for Horticultural Produce
Ag.E			MIE	Micro Irrigation Systems		
					AME	Agricultural Machinery and Equipment
	FRES	Fundamentals of Renewable Energy Sources			APEFQ	Agriculture Process Engineering and Food Quality
	NPD	New Product Development	ESB	Entrepreneurship and Small Business Management	BPS	Business Policy & Strategic Management
EDC			CIM	Change & Innovations Management	GM	Green Marketing
			PFP	Personal Financial Planning	SM	Startup Management
			EBM	E-Business Management	VM	Venture Management