PROGRAM CURRICULUM

ELECTRICAL & ELECTRONICS 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

ADITYA UNIVERSITY

Department of EEE

Vision

To become a global leader in Electrical Engineering with innovation for sustainable development.

Mission

M1: Impart quality education and entrepreneur skills through cutting-edge technologies.

M2: Encourage innovation, interdisciplinary collaboration, and industry engagement.

M3: Promote ethics, social responsibility, and environmental awareness.

Graduates of the B.Tech. (Electrical and Electronics Engineering) will

PEO 1: Excel as professionals with leadership in industry, academia, and research.

PEO 2: Adapt emerging technologies to design complex systems with innovation.

PEO 3: Pursue lifelong learning with integrity, professionalism, and sustainability.

At the end of the program the students will be able to:

PSO 1: Apply power electronics for efficient energy conversion and automation.

PSO 2: Design and manage reliable, sustainable power systems.

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.

ADITYA UNIVERSITY

Department of Electrical and Electronics Engineering

B. Tech (EEE) Program Curriculum – 2024

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

UG Program Offered

- B.Tech in (Electrical and Electronics Engineering)

- B.Tech in (Electrical and Electronics Engineering) with
  - Minor Degree in Civil 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 Engineering
  - 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 (Electrical and Electronics Engineering)

- Minor Stream in Intelligent and Integrated Power Systems
- Minor Stream in Power Electronics and Energy Systems
- Minor Stream in Advanced Specialization on Electric Vehicles (Industry Integrated Program- L & T)
- Minor Stream in Design of Electrical System for Smart Buildings (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	8
6	Value Added Courses (VAC)	6-8	6
7	Summer Internships (SI)	2-4	04
8	Full Semester Internship (or) Project (PROJ)	12	10
9	Mandatory Courses (MC)	-	-
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
241MA001	Linear Algebra & Calculus	FC	2	1		3	50	50	100	-
241CH002	Applied Chemistry	FC	2		1	3	50	50	100	-
241ME001	Engineering Graphics	FC	1		2	3	50	50	100	-
241ME003	Engineering Workshop	FC			1	1	100	-	100	-
241PH002	Modern Physics	FC	2		1	3	50	50	100	-
241MA002	Differential Equations & Vector Calculus	FC	2	1		3	50	50	100	-
241EE002	Electromagnetic Theory	FC	2	1		3	50	50	100	-
241EE003	Electrical Network Analysis-I	FC	2		2	4	50	50	100	-
241MA005	Numerical Methods & Integral Transforms	IC	2	1		3	50	50	100	DEVC
241EE004	DC Machines &Transformers	IC	2		2	4	50	50	100	ENA-I
241EE005	Electrical Network Analysis-II	IC	2		2	4	50	50	100	ENA-I
241MA006	Complex Variables & Statistical Methods	IC	2		1	3	50	50	100	LAC
241EE006	Electric Power Generation & Distribution Systems	IC	3			3	50	50	100	ENA-I/BEEE
241EE007	Induction & Synchronous Machines	IC	2		2	4	50	50	100	EMT

241EE008	Analog Electronic Circuits	IC	3		1	4	50	50	100	-
241EC001	Digital Electronics & Logic Design	IC	2		2	4	50	50	100	-
241EE009	Microprocessor & Interfacing	IC	3		1	4	50	50	100	DELD
241EE010	Power Electronics	IC	2		2	4	50	50	100	-
241EE011	Control Engineering	IC	2		2	4	50	50	100	-
241EE012	Electric Power Transmission Systems	IC	2			2	50	50	100	EPGDS
241EE013	Electrical Measurements & Instrumentation	IC	2		2	4	50	50	100	-
241EE014	Power System Analysis	AC	2		2	4	50	50	100	EPTS
241EE039	Energy converters	AC	3			3	50	50	100	PE
241EE016	Power System Operation & Control	AC	2		2	4	50	50	100	PSA
	Total		**48**	**04**	**29**	**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	-
241CS003	Data Structures	IC	2		2	4	50	50	100	PPSC
241MB001	Engineering Economics & Management	IC	2			2	50	50	100	-
	Total		**06**		**04**	**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 241UC005 241UC004 241UC006 241UC003	Advanced Cognitive Skills for Engineers (**or**) Proficiency in Foreign language (Japanese/German/Spanish/ French)	FC			1	1	100	-	100	-
241UC007	Design Thinking	FC			1	1	100	-	100	-
241UC008	Universal Human Values	FC	2			2	50	50	100	-
241UC009	Technical Paper Publication	AC			2	2	100	-	100	-
241EE057	Student Activity-Based Learning	AC				2				
	Total		**02**		**05**	**09**				

Skill Enhancement Courses (SEC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241IT001	IT & AI Skills	FC			2	2	50	50	100	-
241EE017	Smart Technology & Applications Lab	IC			2	2	50	50	100	-
241CS005	Machine Learning with Python	IC			2	2	50	50	100	-
241EE018	Intelligent Algorithms for Power Systems	AC			2	2	50	50	100	-
	Total				**08**	**08**				

Value Added Courses (VAC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241UC010	Indian Cultural Heritage & Fine Arts	FC			1	1	100	-	100	-
241PE001	Sports & Yoga	FC			1	1	100	-	100	-
241CS004	Internet of Things	FC			1	1	100	-	100	-
241UC011	Employability Skills -1	FC			3	0	100	-	100	-
241UC013	Employability Skills - II	FC			3	0	100	-	100	ES-1
241CS002	Data Analysis Using Python	IC			2	2	50	50	100	-
241UC014	Employability Skills - III	IC			3	0	100	-	100	ES-2
241UC015	Employability Skills - IV	IC			3	0	100	-	100	ES-3
241UC016	Employability Skills - V	AC			3	1	100	-	100	ES-4
	Total				**20**	**06**				

Summer Internships (SI)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241EE019	Summer Internship-I	IC			2	2	100	-	100	-
241EE020	Summer Internship-II	AC			2	2	100	-	100	-
	Total				**04**	**04**				

Full Semester Internship (PROJ)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241EE021	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	FC	2			0	100	-	100	-
	Total		10			**0**				

Minor Stream Courses: Intelligent and Integrated Power Systems

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241EE022	Electrical Machine Design	FC	2	1		3	50	50	100	-
241EE027	Utilization of Electrical Energy	FC	3			3	50	50	100	DCMT
241EE024	Electrical Distribution System	IC	3			3	50	50	100	EPGDS
241EE026	HVDC Transmission	IC	3			3	50	50	100	PE
241EE030	Methods & Algorithms for Intelligent Control	IC	3			3	50	50	100	-
241EE023	High Voltage Engineering	IC	3			3	50	50	100	EPTS
241EE028	Restructured Power Systems	AC	3			3	50	50	100	EPTS
241EE031	Advance Control Systems	AC	2	1		3	50	50	100	CE
241EE032	Concept of Smart Grid Technology	AC	2			2	50	50	100	PSA
241EE025	Flexible Alternating Current Transmission Systems	AC	3			3	50	50	100	PE
241EE029	Soft Computing Techniques in Power Systems	AC	2		1	3	50	50	100	PSA
	Total		**29**	**2**	**1**	**32**				

Minor Stream Courses: Power Electronics and Energy Systems

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241EE022	Electrical Machine Design	FC	2	**1**		3	50	50	100	-
241EE034	Alternative Energy Sources	FC	3			3	50	50	100	-
241EE027	Utilization of Electrical Energy	FC	3			3	50	50	100	DCMT
241EE035	Special Electrical Machines	IC	3			3	50	50	100	ISM
241EE036	Electric Energy Storage Systems	IC	3			3	50	50	100	AES
241EE038	Digital Control Systems	AC	2	1		3	50	50	100	CE
241EE015	Switch Gear & Protection	AC	3			3	50	50	100	EPTS
241EE033	Energy Audit, Conservation & Management	AC	3			3	50	50	100	EPGDS
241EE032	Concept of Smart Grid Technology	AC	2			2	50	50	100	PSA
241EE040	Power Quality	AC	3			3	50	50	100	EPGDS
241EE037	Hybrid Electric Vehicles	AC	3			3	50	50	100	PE
	Total		**29**	**2**		**32**				

Minor Stream Courses: Advanced Specialization on Electric Vehicles (Industry Integrated Program- L & T)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241EE043	Electrical safety	FC	3			3	50	50	100	-
241EE047	Finance for Professionals	FC	3			3	50	50	100	
241EE041	Foundations of EV & Hybrid Vehicles	FC	3			3	50	50	100	PE
241EE035	Special Electrical Machines	IC	3			3	50	50	100	ISM
241EE044	EV Power Electronics & Embedded Systems	IC	3			3	50	50	100	EVBT
241EE042	EV Battery Technology & Power train Development	IC	3			3	50	50	100	PE
241EE045	EV Design & Analysis	IC	3			3	50	50	100	
241EE033	Energy Audit, Conservation & Management	AC	3			3	50	50	100	EPGDS
241ME043	EV Charging Infrastructure, Vehicle Testing & Homologation	AC	3			3	50	50	100	-
241EE046	EV PCB Design & Data Analytics	AC	3			3	50	50	100	
241EE032	Concept of Smart Grid Technology	AC	2			2	50	50	100	PSA
	Total		**32**			**32**				

Minor Stream Courses: Design of Electrical System for Smart Buildings (Industry Integrated Program- L & T)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241EE043	Electrical safety	FC	3			3	50	50	100	-
241EE047	Finance for Professionals	FC	3			3	50	50	100	
241EC065	Applied Industrial IoT	FC	3			3	50	50	100	IOT
241EE048	Electrical Power Distribution & Automation	IC	3			3	50	50	100	EPGDS
241EE035	Special Electrical Machines	IC	3			3	50	50	100	ISM
241EE049	Integrated Approach to Building Services	IC	3			3	50	50	100	-
241EE033	Energy Audit, Conservation & Management	AC	3			3	50	50	100	EPGDS
241EE050	Building Information Modelling	AC	3			3	50	50	100	-
241EE051	Advanced Electrical System Design for Builders	AC	3			3	50	50	100	
241EE052	Extra Low Voltage System Design for Buildings	AC	3			3	50	50	100	
241EE032	Concept of Smart Grid Technology	AC	2			2	50	50	100	PSA
	Total		**32**			**32**				

#Syllabus for the industry partner courses will be released in the department as and when required.

UNIVERSITY OPEN ELECTIVE COURSES

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,MinE	FPE
241ME058	Industry 5.0 for Engineers	AC	3			3	50	50	100	CE,EEE, ECE, CSE,IT, AIML, CSE(DS) PT,MinE	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**					

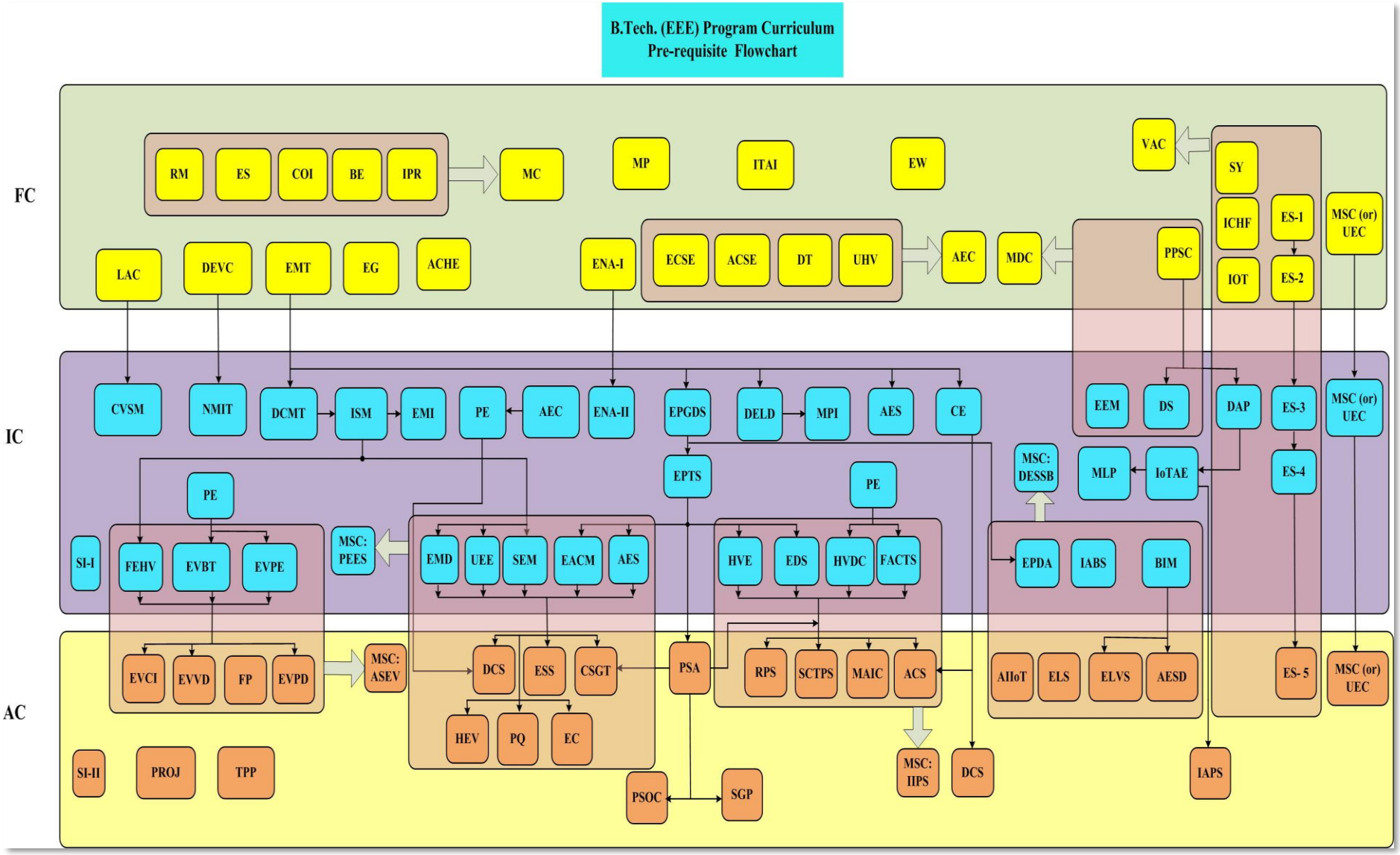
Supply Chain Management											
Course Code	**Course Name**	**Level**	**L**	**T**	**P**	**C**	**CIE**	**SEE**	**Total**	**Offered to Programs**	**Pre-requisite**
241MB017	Introduction to Supply Chain Management	FC	2			2	50	50	100	CE,EEE,ME, ECE, CSE,IT, AIML,CSE(DS) PT,Min.E	-
241MB018	Logistics & 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	-
241CE079	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.	-


B.Tech. (EEE) Program Curriculum
Pre-requisite Flowchart
FC
IC
AC
RM
ES
COI
BE
IPR
MC
MP
ITAI
EW
VAC
SY
ICHF
IOT
ES-1
ES-2
MSC (or) UEC
LAC
DEVC
EMT
EG
ACHE
ENA-I
ECSE
ACSE
DT
UHV
AEC
MDC
PPSC
CVSM
NMIT
DCMT
ISM
EMI
PE
AEC
ENA-II
EPGDS
DELD
MPI
AES
CE
EEM
DS
DAP
ES-3
MSC (or) UEC
PE
EPTS
PE
MSC: DESSB
MLP
IoTAE
ES-4
SI-I
FEHV
EVBT
EVPE
MSC: PEES
EMD
UEE
SEM
EACM
AES
HVE
EDS
HVDC
FACTS
EPDA
IABS
BIM
EVCI
EVVD
FP
EVPD
MSC: ASEV
DCS
ESS
CSGT
PSA
RPS
SCTPS
MAIC
ACS
AIIoT
ELS
ELVS
AESD
ES- 5
MSC (or) UEC
HEV
PQ
EC
SI-II
PROJ
TPP
PSOC
SGP
MSC: IIPS
DCS
IAPS

FC: Foundation Courses

LAC	:	Linear Algebra & Calculus	ACHE	:	Applied Chemistry	EMT	: Electromagnetic Theory
MP	:	Modern Physics	DEVC	:	Differential Equations & Vector Calculus	EW	: Engineering Workshop
ENA-I	:	Electrical Network Analysis-I	EG	:	Engineering Graphics		

SEC: Skill Enhancement Courses

ITAI	:	IT & AI Skills	MLP	:	Machine Learning with Python	IoTAE	: IoT Applications of Electrical Engineering
IAPS	:	Intelligent Algorithms for Power Systems					

AEC: Ability Enhancement Courses

ECSE	:	Essential Cognitive Skills for Engineers	ACSE	:	Advanced Cognitive skills for Engineers	DT	: Design Thinking
						UHV	: Universal Human Values

VAC: Value Added Courses

ICHF	:	Indian Cultural Heritage & Fine Arts	SY	:	Sports &Yoga	IOT	: Internet of Things
			DAP	:	Data Analysis Using Python	ES-1	: Employability Skills - 1
ES-2	:	Employability Skills - 2	ES-3	:	Employability Skills - 3	ES-4	: Employability Skills - 4
ES-5	:	Employability Skills - 5					

MC: Mandatory Courses

ES	:	Environmental Science	COI	:	Constitution of India	IPR	: Intellectual Property Rights & Patents
RM	:	Research Methodology	BE	:	Biology for Engineers		

MDC: Multidisciplinary Courses

PPSC	:	Programming for Problem Solving Using C	DS	:	Data Structures	EEM	: Engineering Economics & Management

IC: Intermediate-level courses

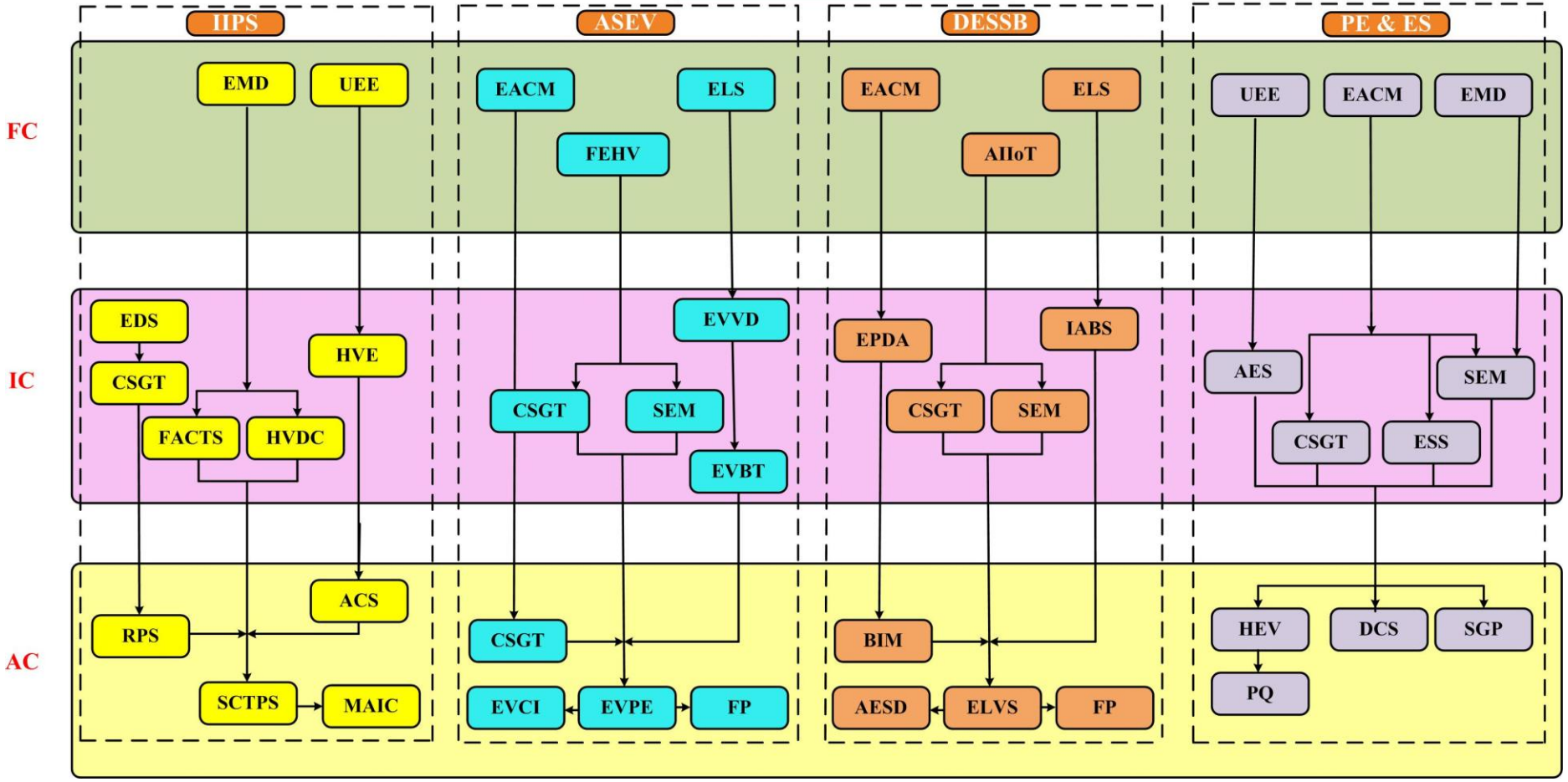
ISM	:	Induction Synchronous Machines	CVSM	:	Complex Variables & Statistical Methods	NMIT	: Numerical Methods & Integral Transforms
DCMT	:	DC Machines & Transformers	PE	:	Power Electronics	AEC	: Analog Electronic Circuits
ENA-II	:	Electrical Network Analysis-II	CE	:	Control Engineering	SI-I	: Summer Internship-I
EMI	:	Electrical Measurements	EPGDS	:	Electric Power Generation	EPTS	: Electric Power Transmission

		&Instrumentation			&Distribution Systems		Systems
DELD	:	Digital Electronics & Logic Design	MPI	:	Microprocessor &Interfacing		

AC: Advanced Courses

PSA	:	Power System Analysis	EC	:	Energy Converters	TPP	: Technical Paper Publication
PSOC	:	Power System Operation & Control	SI-II	:	Summer Internship-II	PROJ	: Full Semester Internship (or) Project

2024 B.Tech. EEE Curriculum
Minor Prerequisite Flowchart



MSC: Minor Stream Courses

IIPS: Intelligent and Integrated Power Systems

HVE:	:	High Voltage Engineering	EDS	:	Electrical Distribution System	HVDC	:	HVDC Transmission
FACTS	:	Flexible Alternating Current Transmission Systems	SCTPS	:	Soft Computing Techniques in Power Systems	MAIC	:	Methods & Algorithms for Intelligent Control
RPS	:	Restructured Power Systems	EMD	:	Electrical Machine Design	ACS	:	Advance Control Systems

PEES: Power Electronics and Energy Systems

EACM	:	Energy Audit, Conservation & Management	CSGT	:	Concept of Smart Grid Technology	UEE	:	Utilization of Electrical Energy
						AES	:	Alternative Energy Sources
SEM	:	Special Electrical Machines	ESS	:	Electric Energy Storage Systems	HEV	:	Hybrid Electric Vehicles
DCS	:	Digital Control Systems	PQ	:	Power Quality	SGP	:	Switch Gear & Protection

ASEV: Advanced Specialization on Electric Vehicles

FEHV	:	Foundations of EV & Hybrid Vehicles	EVBT	:	EV Battery Technology & Powertrain Development	ELS	:	Electrical Safety
EVPD	:	EV PCB Design & Data Analytics	EVPE	:	EV Power Electronics & Embedded Systems	EVCI	:	EV Charging Infrastructure, Vehicle Testing & Homologation
EVVD	:	EV Design & Analysis	FP	:	Finance for Professionals			

DESSB: Design of Electrical System for Smart Buildings

EPDA	:	Electrical Power Distribution & Automation	IABS	:	Integrated Approach to Building Services	BIM	:	Building Information Modelling
						AIIoT	:	Applied Industrial IoT
ELVS	:	Extra Low Voltage System Design for Buildings	AESD	:	Advanced Electrical System Design for Builders			

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	3
241PH002	Modern Physics	MCC	FC	2		1	3	4
241ME001	Engineering Graphics	MCC	FC	1		2	3	5
241CS001	Programming for Problem Solving Using C	MDC	FC	2		2	4	6
241UC008	Universal Human Values	AEC	FC	2			2	2
241EN001	Essential Cognitive Skills for Engineers	AEC	FC			1	1	2
241IT001	IT & AI Skills	SEC	FC			2	2	4
241ME003	Engineering Workshop	MCC	FC			1	1	2
241PE001	Sports & Yoga	VAC	FC			1	1	2
	Total			**09**	**01**	**10**	**20**	**30**

II SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241EE003	Electrical Network Analysis-I	MCC	FC	2		2	4	6
241MA002	Differential Equations & Vector Calculus	MCC	FC	2	1		3	3
241CH002	Applied Chemistry	MCC	FC	2		1	3	4
241CS003	Data Structures	MDC	IC	2		2	4	6
241MB001	Engineering Economics & Management	MDC	IC	2			2	2
241UC007	Design Thinking	AEC	FC			1	1	2
241EN002 241UC005 241UC004 241UC006 241UC003	Advanced Cognitive Skills for Engineers **(or)** Proficiency in Foreign language (Japanese/German/Spanish/ French)	AEC	FC			1	1	2
241UC011	Employability Skills -I	VAC	FC			3	0	3
241UC010	Indian Cultural Heritage & Fine Arts	VAC	FC			1	1	2
241AC001	Environmental Science	MC	FC	2			0	2
	Total			**12**	**01**	**11**	**19**	**32**

III SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241MA005	Numerical Methods & Integral Transforms	MCC	IC	2	1		3	3
241EE004	DC Machines & Transformers	MCC	IC	2		2	4	6
241EE002	Electromagnetic Theory	MCC	FC	2	1		3	3
241EE005	Electrical Network Analysis-II	MCC	IC	2		2	4	6
241EE008	Analog Electronic Circuits	MCC	IC	3		1	4	5
	Minor Stream Course –1/ University Open Elective Course – 1	MSC/UEC	FC/IC	3			3	2
241CS004	Internet of Things	VAC	FC			1	1	2
241UC013	Employability Skills -II	VAC	FC			3	0	3
241AC002	Constitution of India	MC	FC	2			0	2
	Total			**16**	**02**	**09**	**22**	**32**

IV SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241MA006	Complex Variables & Statistical Methods	MCC	IC	2	1		3	3
241EE006	Electric Power Generation & Distribution Systems	MCC	IC	3			3	3
241EE007	Induction & Synchronous Machines	MCC	IC	2		2	4	6
241EE010	Power Electronics	MCC	IC	2		2	4	6
	Minor Stream Course –2/University Open Elective Course – 2	MSC/ UEC	IC/AC	3			3	3
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			**14**	**01**	**09**	**19**	**30**

V SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241EE011	Control Engineering	MCC	IC	2		2	4	6
241EE012	Electric Power Transmission Systems	MCC	IC	2			2	2
241EC001	Digital Electronics & Logic Design	MCC	IC	2		2	4	6
	Minor Stream Course – 3/ University Open Elective Course –3	MSC/ UEC	IC	3			3	3
	Minor Stream Course – 4 /University Open Elective Course –4	MSC/ UEC	IC	3			3	3
	Minor Stream Course – 5/University Open Elective Course –5	MSC/ UEC	FC/IC	3			3	3
241EE017	Smart Technology & Applications Lab	SEC	IC			2	2	4
241UC015	Employability Skills -IV	VAC	IC			3	0	3
241EE019	Summer Internship-I	SI	IC			2	2	4
241AC004	Intellectual Property Rights & Patents	MC	FC	2			0	2
	Total			**17**		**11**	**23**	**36**

VI SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241EE009	Microprocessor & Interfacing	MCC	IC	3		1	4	5
241EE013	Electrical Measurements & Instrumentation	MCC	IC	2		2	4	6
241EE014	Power System Analysis	MCC	AC	2		2	4	6
241CS005	Machine Learning with Python	SEC	IC			2	2	4
241AC005	Indian Knowledge Systems	MC	FC	2			0	2
	Minor Stream Course – 6/ University Open Elective Course - 6	MSC/ UEC	IC/AC	3			3	3
	Minor Stream Course – 7/ University Open Elective Course - 7	MSC/ UEC	IC/AC	3			3	3
	Minor Stream Course – 8/ University Open Elective Course –8	MSC/ UEC	IC/AC	3			3	3
	Total			**18**		**7**	**23**	**32**

VII SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241EE039	Energy converters	MCC	AC	3			3	3
241EE016	Power System Operation & Control	MCC	AC	2		2	4	6
	Minor Stream Course – 9/ University Open Elective Course –9	MSC/ UEC	AC	2			2	3
	Minor Stream Course – 10/ University Open Elective Course - 10	MSC/ UEC	AC	3			3	3
	Minor Stream Course – 11/ University Open Elective Course –11	MSC/ UEC	AC	3			3	3
241EE018	Intelligent Algorithms for Power Systems	SEC	AC			2	2	4
241EE020	Summer Internship-II	SI	AC			2	2	4
	Total			**13**		**6**	**19**	**26**

VIII SEMESTER

Course code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
241UC016	Employability Skills -V	VAC	AC			3	1	3
241UC009	Technical Paper Publication	AEC	AC			2	2	4
241EE057	Student Activity-Based Learning	AEC	AC				2	
241EE021	Full Semester Internship (or) Project	PROJ	AC			10	10	20
	Total					**17**	**15**	**27**

Total Credit: 160.

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

Minor Degree in Electrical and Electronics Engineering
(offered to other branches students)

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
241EE053	Electric Power Generation, Transmission & Distribution Systems	IC	3			3	50	50	100	ENA-1/BEEE
241EE034 241EE027	Alternative Energy Sources (or) Utilization of Electrical Energy	IC	3			3	50	50	100	EPGDS / BEEE/ ISM
241EE037 241EE035	Hybrid Electric Vehicles (or) Special Electric machines	AC	3			3	50	50	100	FPE/ OCEM
241EE043 241EE030	Electrical Safety (or) Methods & Algorithms for Intelligent Control	AC	3			3	50	50	100	EPGDS/PSA
	Total		18		2	20				

Minor Degree in Civil Engineering

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	3			3	50	50	100	-
241CE054 / 241CE047	Railway Engineering (or) Docks & Harbour Engineering	FC	3			3	50	50	100	-
241CE036 / 241CE037	Environmental Impact & Risk Management (or) Environmental Management	IC	3			3	50	50	100	-
241CE056 / 241CE049	Urban Transportation Planning (or) Intelligent Transportation Systems	IC	3			3	50	50	100	-
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 (or) Sensors & Actuators	IC	3			3	50	50	100	ADC
241EC091										
241EC092	Embedded Microcontrollers (or) Digital System Design	IC	2		1	3	50	50	100	ADC, PPSC
241EC093										
241EC067	Introduction to Internet of Things (or) Modern Wireless Communications	AC	2		1	3	50	50	100	EM, WLAN's &PAN's
241EC074			3			3	50	50	100	FC
Total			**16**		**4**	**20**				

Minor Degree in Computer Science and Engineering

Course Code	Course Name	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 241IT006	Object Oriented Programming through C++ (or) Java Programming	IC	2		2	4	50	50	100	PPSC
241CS016	Introduction to MERN Stack Development(or) Information Security Analysis & Audit	IC			2	2	50	50	100	JP
241CS030			2			2	50	50	100	-
241CS018	Advanced MERN Stack Development (or) Flutter Fundamentals	AC			2	2	50	50	100	IMSD
241IT012					2	2	50	50	100	-
	Total		**12**		**8**	**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 (or) Business Intelligence & Analytics	IC	2		1	3	50	50	100	-
241CS036										PPSC
241AI004	Big Data Analytics (or) Data Visualization	AC	2		1	3	50	50	100	DM/DAP
241AI019										
241CS041	Social Network Analysis (or) Social Networks & Semantic Web	AC	2		1	3	50	50	100	-
241CS040										
	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) Fundamentals of Data Science	IC	*2*		1	3	50	50	100	AI
241CS034			2		1					-
241AI010	Natural Language Processing (or) Data Visualization	AC	2		1	3	50	50	100	DAP
241AI019										
241AI016	Prompt Engineering & GenAI (or) Social Network Analysis	AC	2		1	3	50	50	100	ML
241CS041										
241AI017	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
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 (or) Underground Metal Mining Technology	IC	3			3	50	50	100	DMD
241MN008										
241MN014	Mine Legislation & General Safety (or) Environmental Pollution & Control	AC	3			3	50	50	100	UCMT / UMMT
241MN028										
241MN045	Industrial Safety Practices (or) Ground Control	AC	2			2	50	50	100	-
241MN046										
Total			**20**			**20**				

Minor Degree in Agricultural Engineering

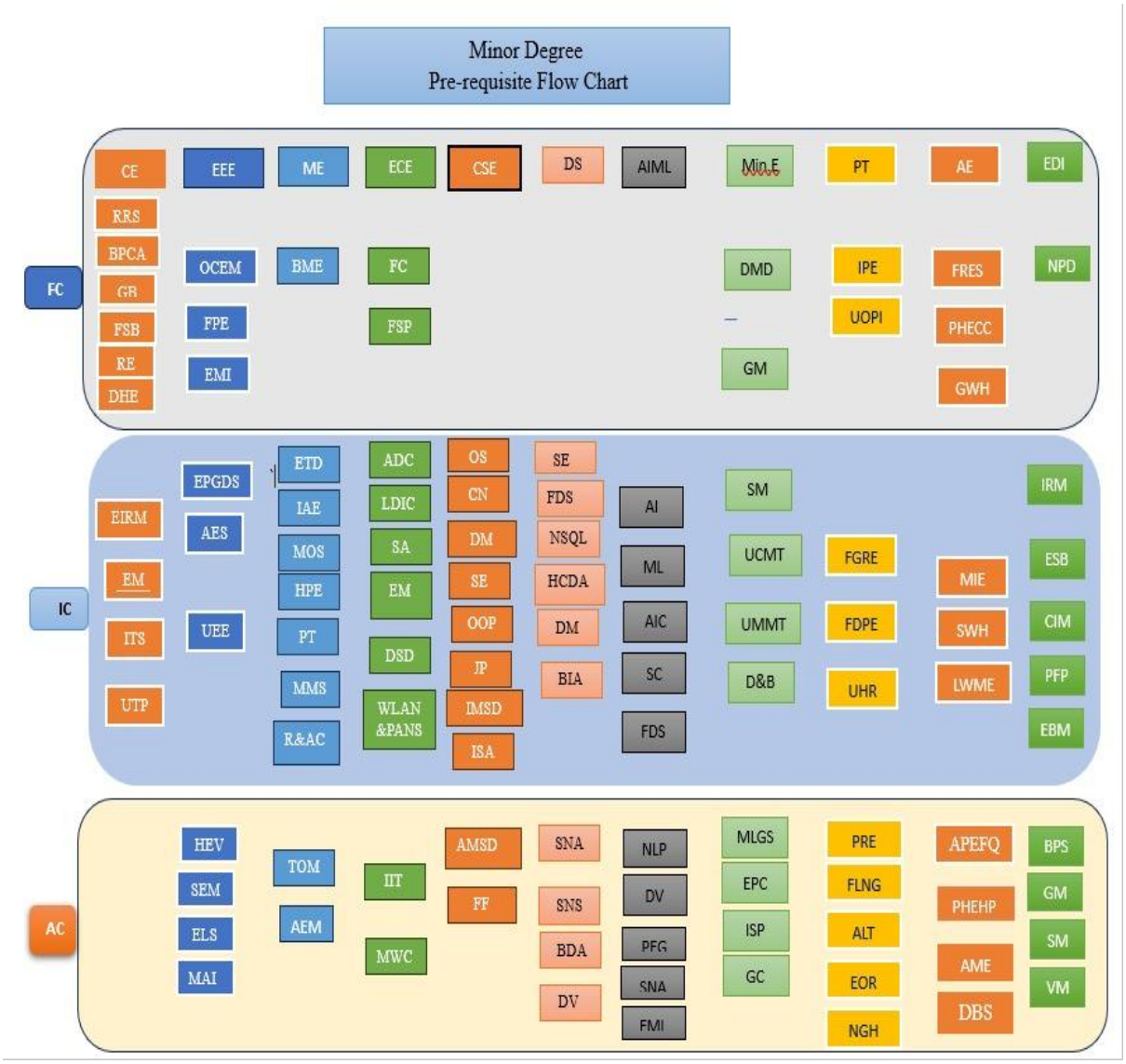
Agricultural Engineering							Marks			Pre-requisite
Course Code	**Course Name**	**Level**	**L**	**T**	**P**	**C**	**CIE**	**SEE**	**Total**	
241AE082	Fundamentals of Renewable Energy Sources	FC	3	0	0	3	50	50	100	-
241AE083	Post-harvest Engineering of Cereal Crops	FC	3	0	0	3	50	50	100	-
241AE084	Ground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

Minor Degree in Entrepreneurship Development & 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 (or) E-Business management	IC	3			3	50	50	100	-
241MB012										
241MB013	Business Policy & Strategic Management (or) Green Marketing	AC	3			3	50	50	100	-
241MB014										
241MB015	Startup Management (or) Venture Management	AC	3			3	50	50	100	-
241MB016										
	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
FC
CE
EEE
ME
ECE
CSE
DS
AIML
Min.E
PT
AE
EDI
RRS
BPCA
GB
FSB
RE
DHE
OCEM
FPE
EMI
BME
FC
FSP
DMD
GM
IPE
UOPI
FRES
PHECC
GWH
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
SE
OOP
JP
IMSD
ISA
SE
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
PFG
SNA
FMI
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&Algorithmsfor Intelligent Control
	FPE	Fundamentals of Power Electronics	EPGDS	Electric Power Generation &Distribution Systems	HEV	Hybrid Electric Vehicles
	EMI	Electrical Measurements & Instrumentation	UEE	UtilizationofElectricalEnergy	SEM	Special Electric Machines
					ES	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		
			SA	Sensors & Actuators		
	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		
			OOP	Object Oriented Programming through C++	AMSD	Advanced MERN Stack Development
			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		
DS			DM	Data Mining	SNA	Social Network Analysis
			FDS	Fundamentals of Data Science	DV	Data Visualization
			SE	Software Engineering	BDA	Big Data Analytics
			NSQL	NoSQL Databases	SNSW	Social Networks and Semantic Web
			BIA	Business Intelligence & Analytics		
			HCDA	Health Care Data Analysis		
AIML			ML	Machine Learning	DV	Data Visualization
			AI	Artificial Intelligence	PEG	Prompt Engineering and GenAI

			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		
	FRES	Fundamentals of Renewable Energy Sources			AME	Agricultural Machinery and Equipment
					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
			IRM	Insurance and Risk Management		