B. TECH. FOUR YEAR DEGREE

PROGRAM CURRICULUM

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

MECHANICAL ENGINEERING

ADITYA
UNIVERSITY

Aditya Nagar, ADB Road, Surampalem - 533 437

ADITYA UNIVERSITY

Department of Mechanical Engineering

VISION:

To be a globally recognized pioneer in Mechanical Engineering by promoting Excellence in Education, fostering Innovative Research, and delivering Sustainable Solutions to address global challenges.

MISSION

M1: Ensure educational excellence through infrastructure supporting industry-aligned design and development.

M2: Develop innovative research ecosystem through collaborations with industry and academia.

M3: Integrate Leadership and Teamwork Capabilities for solving inclusive community challenges.

PROGRAM EDUCATIONAL OUTCOMES:

Graduates of the Program will

PEO 1: Excel in careers or entrepreneurship by applying mechanical engineering knowledge with innovation and responsibility.

PEO 2: Pursue higher education, interdisciplinary research, and contribute to sustainable development.

PEO 3: Engage in lifelong learning and adapt to emerging technologies for professional growth

PROGRAM SPECIFIC OUTCOMES:

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

PSO 1: Design and develop components for enhancement of manufacturing processes with modern engineering tools.

PSO 2: Create sustainable energy systems effectively for a variety of technical applications.

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 Mechanical Engineering

B. Tech (ME) Program Curriculum – 2025

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

UG Programs Offered

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

- Minor Stream in Automation & Robotics
- Minor Stream in Thermal Engineering
- Minor Stream in Automotive Engineering
- Minor Stream in Design and Manufacturing
- Minor Stream in Advanced Specialization on Electric Vehicles Industry Integrated Program- L & T

Credit Division Category Wise

S. No	Broad Category of Course	UGC	Credits
1	Major Core Courses (MCC)	80	80
2	Minor Stream Courses (MSC) (or) University Open Elective Courses (UEC)	32	32
3	Multidisciplinary Courses (MDC)	9	11
4	Ability Enhancement Courses (AEC)	8	9
5	Skill Enhancement Courses (SEC)	9	6
6	Value Added Courses (VAC)	6-8	6
7	Summer Internship (SI)	2-4	4
8	Full Semester Internship (PROJ)	12	12
9	Mandatory Course (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	-
2501PH01	Solid State Physics	FC	2		1	3	50	50	100	-
2501CH01	Engineering Chemistry	FC	2		1	3	50	50	100	-
2501ME01	Engineering Graphics	FC	1		2	3	50	50	100	-
2501ME03	Engineering Workshop	FC			1	1	100	-	100	-
2501ME02	Engineering Mechanics	FC	2	1	1	4	50	50	100	-
2501ME04	Engineering Thermodynamics	IC	2	1		3	50	50	100	SSP/ MP
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
2501ME05	Fluid Mechanics & Hydraulic Machines	IC	2	1	1	4	50	50	100	SSP
2501ME06	Material Science and Deformation	IC	2		2	4	50	50	100	EC
2501ME07	Manufacturing Process-I	IC	2		2	4	50	50	100	EW
2501ME08	Automobile Engineering	IC	3		1	4	50	50	100	SSP
2501ME09	Kinematics of Machinery	IC	2	1	1	4	50	50	100	EM
2501ME10	Internal Combustion Engine	IC	2		2	4	50	50	100	ETD
2501ME11	Manufacturing Process-II	IC	2		2	4	50	50	100	MP – I
2501ME12	Heat Power Engineering	IC	2	1		3	50	50	100	ETD
2501ME13	Machine Design	IC	2	1		3	50	50	100	EG
2501ME14	Computer Aided Machine Drawing (CAMD)	IC			3	3	50	50	100	EG

2501MB01	Engineering Economics & Management	IC	2			2	50	50	100	-
2501ME15	Mechatronics	IC	3		1	4	50	50	100	MP-I
2501ME16	Heat Transfer	AC	2	1	1	4	50	50	100	HPE
2501ME17	Dynamics of Machinery	AC	2	1	1	4	50	50	100	KOM
Total			**45**	**12**	**23**	**80**				

Multidisciplinary Courses (MDC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501EE01	Basic Electrical & Electronics Engineering	FC	2		2	4	50	50	100	-
2501CS01	Programming for Problem Solving Using C	FC	2		2	4	50	50	100	-
2501ME18	Operations Research	IC	2	1		3	50	50	100	-
Total			**6**	**1**	**4**	**11**				

Ability Enhancement Courses (AEC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Prerequisite
2501EN01	Essential Cognitive Skills for Engineers	FC			1	1	100	-	100	-
2501EN02	Advanced Cognitive Skills for Engineers	FC			1	1	100	-	100	-
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	-
2501ME91	Student Activity Based Learning	AC				2	100	-	100	-
Total			**2**		**5**	**9**				

Skill Enhancement Courses (SEC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501ME19	Digital Manufacturing Lab	IC			2	2	50	50	100	-
2501ME20	Analysis & Simulation Lab	AC			2	2	50	50	100	-
2501AI01	Artificial Intelligence & Machine Learning Lab	AC			2	2	50	50	100	-
Total			-	-	**6**	**6**				

Value Added Courses (VAC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501IT01	Business Intelligence Lab	FC			2	2	50	50	100	-
2501CS04	Internet of Things	FC			1	1	50	50	100	-
2501CS02	Data Analysis using Python	IC			2	2	50	50	100	PPSC
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
Total					**20**	**6**				

Summer Internships (SI)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501ME21	Summer Internship - I	IC			2	2	100	-	100	-
2501ME22	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
2501ME23	Full Semester Internship	AC			12	12	50	50	100	-
Total					**12**	**12**				

Mandatory Course (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: Automation & Robotics

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501ME24	Elements of Robotics	FC	2			2	50	50	100	-
2501ME25	Programming for Robotics	IC	2		1	3	50	50	100	PPSC
2501ME26	Digital Manufacturing	IC	3			3	50	50	100	MP-I
2501ME27	Advanced Fluid Power & Control Systems	IC	2		1	3	50	50	100	FMHM
2501ME28	Robotic Mobility Systems	AC	2		1	3	50	50	100	EOR
2501ME29	Control of Robotic System	AC	2		1	3	50	50	100	RMS
2501ME30	AI for Robotics	AC	2		1	3	50	50	100	EOR
2501ME31	Robotic Operating System	AC	2		1	3	50	50	100	DAP
2501ME32	Advanced Robotic Operating System	AC	2		1	3	50	50	100	ROS
2501ME33	Field & Service Robotics	AC	2		1	3	50	50	100	PFR
2501ME34	Robotic Process Automation (Industry Partnered Certification Program)	AC	3			3	50	50	100	EOR
Total			**24**		**8**	**32**				

Minor Stream: Thermal Engineering

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501ME35	Power Plant Engineering	FC	2			2	50	50	100	-
2501ME36	Sustainable Energy Systems	FC	3			3	50	50	100	-
2501ME37	Solar Energy Systems	FC	3			3	50	50	100	-
2501ME38	Alternative Fuels for IC engines	IC	3			3	50	50	100	ICE
2501ME39	Fuel Cell Technology	IC	3			3	50	50	100	ICE
2501ME40	Refrigeration & Air Conditioning	IC	2	1		3	50	50	100	ETD
2501ME41	Hydraulic Machinery & Systems	IC	3			3	50	50	100	FMHM
2501ME42	Cryogenic Engineering	AC	3			3	50	50	100	R&AC
2501ME44	Energy Storage Systems	AC	3			3	50	50	100	BEEE
2501ME45	Gas Dynamics & Jet Propulsion	AC	2	1		3	50	50	100	HPE

2501ME46	Computational Fluid Dynamics	AC	2	1		3	50	50	100	HT, FMHM
Total			**29**	**3**		**32**				

Minor Stream: Automotive Engineering

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501ME47	Automotive Electrical & Electronics	FC	2			2	50	50	100	BEEE
2501ME48	Automotive Maintenance	IC	2		1	3	50	50	100	AE
2501EE54	Hybrid & Electric Vehicles	IC	3			3	50	50	100	BEEE
2501ME49	Electronic Engine Management System	IC	3			3	50	50	100	HEV
2501ME50	Automotive Certification & Homologation	IC	3			3	50	50	100	AE
2501ME51	Vehicle Infotronics	IC	3			3	50	50	100	AEE
2501ME52	Automotive Aerodynamics	AC	3			3	50	50	100	FMHM, AE
2501ME53	Automotive Noise Vibration & Harshness	AC	3			3	50	50	100	DOM
2501ME54	Vehicle Stability & Control	AC	3			3	50	50	100	AE
2501ME55	Special Purpose Vehicles	AC	3			3	50	50	100	AE
2501ME56	Automotive & Pedestrian Safety	AC	3			3	50	50	100	AE
Total			**31**		**1**	**32**				

Minor Stream: Design and Manufacturing

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501ME57	Plant Layout & Material Handling	FC	2			2	50	50	100	-
2501ME59	Additive Manufacturing	IC	3			3	50	50	100	MF - I
2501ME60	Composite Materials	IC	3			3	50	50	100	SSP/MP
2501ME61	Design for Manufacturing	IC	3			3	50	50	100	MSD
2501ME62	Industrial Automation	IC	3			3	50	50	100	MF - I
2501ME63	Flexible Manufacturing System	IC	3			3	50	50	100	MF - I
2501ME58	Industry 5.0 for Engineers	AC	3			3	50	50	100	-

2501ME64	Design of Transmission Systems	AC	2	1		3	50	50	100	MD
2501ME65	Advanced Mechanics of Solids	AC	2	1		3	50	50	100	MSD
2501ME66	Mechanical Vibrations	AC	2	1		3	50	50	100	DOM
2501ME67	Condition Monitoring	AC	3			3	50	50	100	MV
	Total		**30**	**2**		**32**				

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

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501EE41	Foundations of EV & Hybrid Vehicles	FC	3			3	50	50	100	-
2501ME68	Automotive Mechanics for EV	IC	2			2	50	50	100	MF - I
2501ME69	EV Mechanical Design Development & Analysis	IC	3			3	50	50	100	MSD
2501ME70	EV Product Development, Homologation & Hydrogen FCEV	IC	3			3	50	50	100	AE
2501EE42	EV Battery Technology & Powertrain Development	IC	3			3	50	50	100	BEEE
2501ME43	EV Charging Infrastructure, Vehicle Testing & Homologation	IC	3			3	50	50	100	BEEE
2501EE44	EV Power Electronics & Embedded Systems	AC	3			3	50	50	100	BEEE
2501ME71	EV Data Analytics & Cyber Security	AC	3			3	50	50	100	MD
2501ME72	EV FEA Analysis	AC	3			3	50	50	100	MSD
2501ME54	Vehicle Stability & Control	AC	3			3	50	50	100	AE
2501ME56	Automotive & Pedestrian Safety	AC	3			3	50	50	100	AE
Total			**32**			**32**				

 # L&T 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, ECE,CSE,IT, AIML,CSE(DS) PT,Min.E	DAP
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,	FPE

										CSE(DS) PT,MinE	
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**		**09**	**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,	ISCM

										AIML, CSE(DS) PT,Min.E	
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	-
2501CE62	Waste Water Management	IC	3			3	50	50	100	EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501CE59	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	-
2501CE58	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**		**7**	**32**					

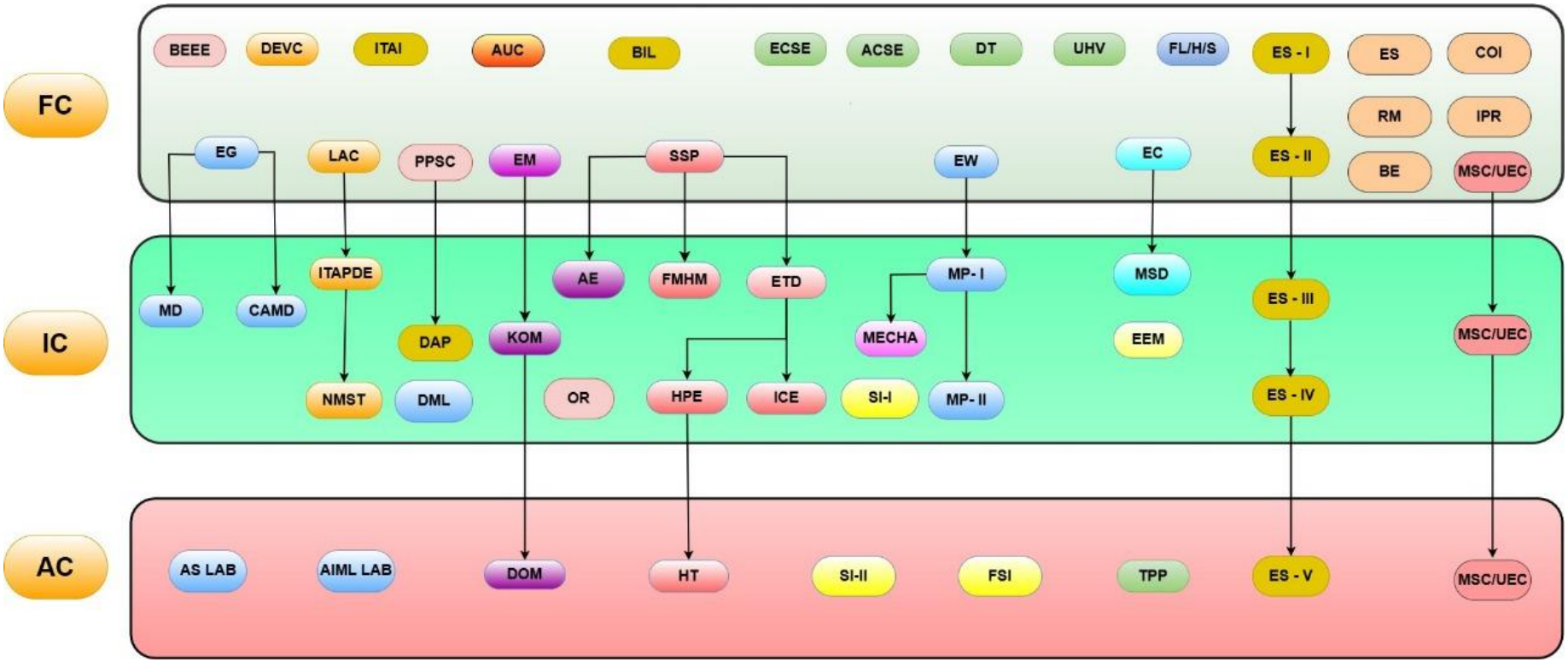
Others											
Course Code	**Course Name**	**Level**	**L**	**T**	**P**	**C**	**CIE**	**SEE**	**Total**	**Offered to Programs**	**Pre-requisite**
2501CE65	Remote Sensing & GIS Applications	FC	3			3	50	50	100	EEE,ME, ECE, CSE,IT, AIML, CSE(DS) PT,Min.E	-
2501EE36	Electric Energy Storage Systems	FC	3			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 Red Hat 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.	-

B. Tech (ME) Program Curriculum

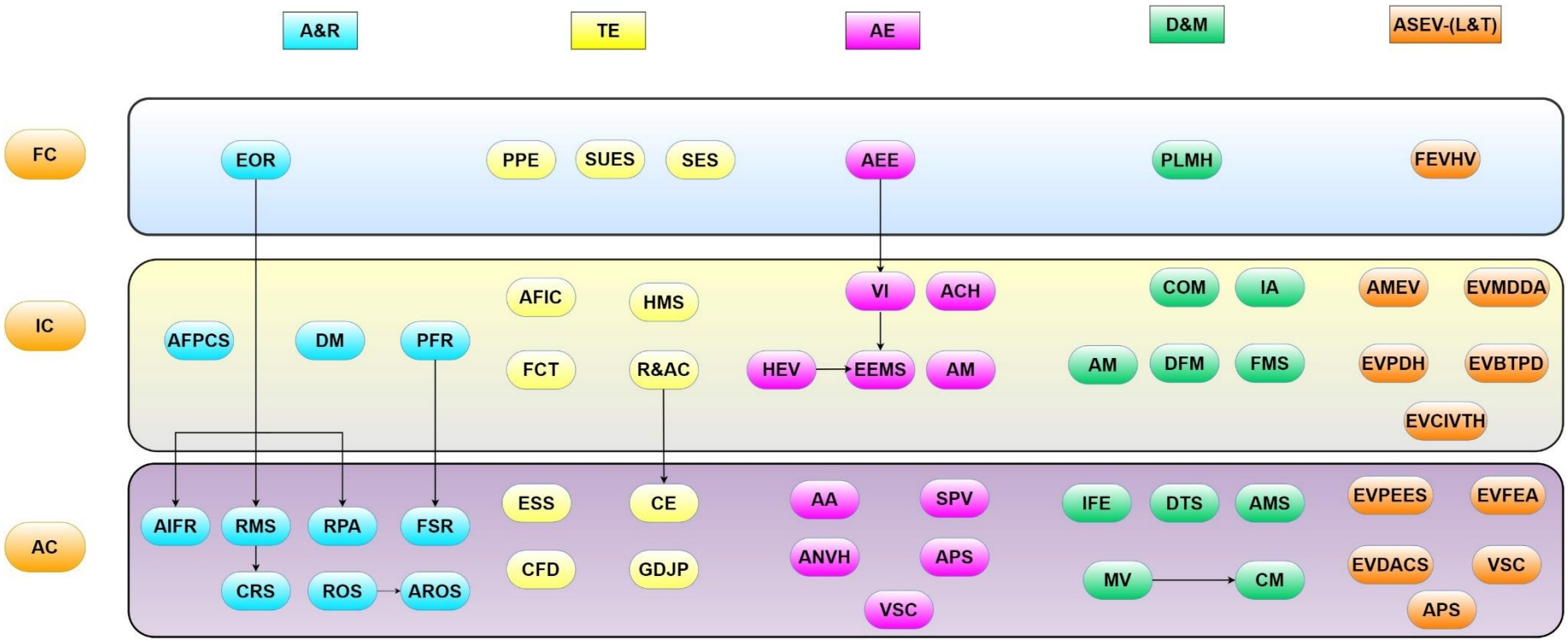
Pre-requisite Flow Chart



Foundation Courses (FC)		Intermediate-Level Courses (IC)		Advanced Courses (AC)	
LAC	Linear Algebra & Calculus	ITAPDE	Integral Transforms & Applications of Partial Differential Equations	HT	Heat Transfer
DEVC	Differential Equations & Vector Calculus	NMST	Numerical Methods & Statistical Techniques	DOM	Dynamics of Machinery
SSP	Solid State Physics	ETD	Engineering Thermodynamics	TPP	Technical Paper publication
EC	Engineering Chemistry	ICE	Internal Combustion Engine	SI-II	Summer Internship-II
EG	Engineering Graphics	MP-I	Manufacturing Process-I	FSI	Full Semester Internship
EM	Engineering Mechanics	HPE	Heat Power Engineering	AS LAB	Analysis & Simulation Lab
EW	Engineering Workshop	FMHM	Fluid Mechanics & Hydraulic Machines	AIML Lab	AIML Lab
BEEE	Basic Electrical & Electronics Engineering	MSD	Material Science and Deformation	ES - V	Employability Skills – V
PPSC	Programming for Problem Solving Using C	MP-II	Manufacturing Process-II	SABL	Student Activity Based Learning
ECSE	Essential Cognitive Skills for Engineers	AE	Automobile Engineering	**MSC** - Minor Stream Courses	
UHV	Universal Human Values	KOM	Kinematics of Machinery	**UEC** - University Open Elective Courses	
ACSE	Advanced Cognitive Skills for Engineers	MD	Machine Design		
DT	Design Thinking using AI	MECHA	Mechatronics		
IOT	Internet of Things	OR	Operations Research		
BIL	Business Intelligence Lab	EEM	Engineering Economics & Management		
ES - I	Employability Skills – I	DAP	Data Analysis using Python		
ES - II	Employability Skills – II	DML	Digital Manufacturing Lab		
ES	Environmental Science	ES - III	Employability Skills – III		
COI	Constitution of India	ES - IV	Employability Skills – IV		
RM	Research Methodology	SI-I	Summer Internship-I		
IPR	Intellectual Property Rights & Patents	CAMD	Computer Aided Machine Drawing		
BE	Biology for Engineers				

B. Tech (ME) Minor Stream

Pre-requisite Flow Chart



Minor Stream		FOUNDATION COURSE (FC)		INTERMEDIATE COURSE (IC)	ADVANCED COURSES (AC)	
Automation & Robotics (A&R)	EOR	Elements of Robotics	PFR	Programming for Robotics	RMS	Robotic Mobility Systems
			DM	Digital Manufacturing	CRS	Control of Robotic System
			AFPCS	Advanced Fluid Power & Control Systems	AIFR	AI for Robotics
					ROS	Robotic Operating System
					AROS	Advanced Robotic Operating System
					FSR	Field & Service Robotics
					RPA	Robotic Process Automation (Industry Partnered Certification Program)
Thermal Engineering (TE)	PPE	Power Plant Engineering	AFIC	Alternative Fuels for IC engines	CE	Cryogenic Engineering
	SUES	Sustainable Energy Systems	FCT	Fuel Cell Technology	ESS	Energy Storage Systems
	SES	Solar Energy Systems	R&AC	Refrigeration & Air Conditioning	GDJP	Gas Dynamics & Jet Propulsion
			HMS	Hydraulic Machinery & Systems	CFD	Computational Fluid Dynamics
Automotive Engineering (AE)	AEE	Automotive Electrical & Electronics	AM	Automotive Maintenance	AA	Automotive Aerodynamics
			HEV	Hybrid & Electric Vehicles	ANVH	Automotive Noise Vibration & Harshness
			EEMS	Electronic Engine Management System	VSC	Vehicle Stability & Control
			ACH	Automotive Certification & Homologation	SPV	Special Purpose Vehicles
			VI	Vehicle Infotronics	APS	Automotive & Pedestrian Safety
Design and Manufacturing (D&M)	PLMH	Plant Layout & Material Handling	AM	Additive Manufacturing	IFE	Industry 5.0 for Engineers
			COM	Composite Materials	DTS	Design of Transmission Systems
			DFM	Design for Manufacturing	AMS	Advanced Mechanics of Solids
			IA	Industrial Automation	MV	Mechanical Vibrations
			FMS	Flexible Manufacturing System	CM	Condition Monitoring
Advanced Specialization on Electric Vehicles (Mechanical) Industry Integrated Program- L & T **(ASEV L & T)**	FEVHV	Foundations of EV & Hybrid Vehicles	AMEV	Automotive Mechanics for EV	EVPEES	EV Power Electronics & Embedded Systems
			EVMDDA	EV Mechanical Design Development & Analysis	EVDACS	EV Data Analytics & Cyber Security
			EVPDH	EV Product Development, Homologation & Hydrogen FCEV	EVFEA	EV FEA Analysis
			EVBTPD	EV Battery Technology and Powertrain Development	VSC	Vehicle Stability & Control
			EVCIVTH	EV Charging Infrastructure, Vehicle Testing & Homologation	APS	Automotive & Pedestrian Safety

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
2501ME02	Engineering Mechanics	MCC	FC	2	1	1	4	5
2501ME03	Engineering Workshop	MCC	FC			1	1	2
2501EN01	Essential Cognitive Skills for Engineers	AEC	FC			1	1	2
2501UC08	Universal Human Values	AEC	FC	2			2	2
2501IT01	Business Intelligence Lab	VAC	FC			2	2	4
Total				**9**	**2**	**8**	**19**	**27**

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
2501ME04	Engineering Thermodynamics	MCC	IC	2	1		3	3
2501CS01	Programming for Problem Solving Using C	MDC	FC	2		2	4	6
2501MB01	Engineering Economics & Management	MCC	IC	2			2	2
2501EN02	Advanced Cognitive Skills for Engineers	AEC	FC			1	1	2
2501CS04	Internet of Things	VAC	FC			1	1	2
2501UC07	Design Thinking using AI	AEC	FC			1	1	2
2501UC11	Employability Skills – I	VAC	FC			3	0	3
2501AC01	Environmental Science	MC	FC	2			0	0
Total				**14**	**2**	**11**	**22**	**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
2501ME05	Fluid Mechanics & Hydraulic Machines	MCC	IC	2	1	1	4	5
2501ME06	Material Science and Deformation	MCC	IC	2		2	4	6
2501ME09	Kinematics of Machinery	MCC	IC	2	1	1	4	5
2501ME10	Internal Combustion Engine	MCC	IC	2		2	4	6
2501ME19	Digital Manufacturing lab	SEC	IC			2	2	4
2501UC13	Employability Skills – II	VAC	FC			3	0	3
2501AC02	Constitution of India	MC	FC	2			0	0
Total				**12**	**3**	**11**	**21**	**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
2501ME07	Manufacturing Process-I	MCC	IC	2		2	4	6
2501ME14	Computer Aided Machine Drawing	MCC	IC			3	3	6
2501ME17	Dynamics of Machinery	MCC	IC	2	1	1	4	5
	Minor Stream Course-1 (or) University Open Elective Course – 1	MSC/UEC	FC/IC	2			2	2
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	0
Total				**10**	**2**	**11**	**18**	**29**

V SEMESTER

Course Code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
2501ME08	Automobile Engineering	MCC	IC	3		1	4	5
2501ME11	Manufacturing Process-II	MCC	IC	2		2	4	6
2501ME12	Heat Power Engineering	MCC	IC	2	1		3	3
	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
2501UC15	Employability Skills – IV	VAC	IC			3	0	3
2501ME21	Summer Internship – I	SI	IC			2	2	4
2501AC04	Intellectual Property Rights & Patents	MC	FC	2			0	0
Total				**18**	**1**	**8**	**22**	**30**

VI SEMESTER

Course Code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
2501ME16	Heat Transfer	MCC	IC	2	1	1	4	5
2501ME18	Operations Research	MDC	IC	2	1		3	3
2501ME13	Machine Design	MCC	IC	2	1		3	3
	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
2501ME20	Analysis & Simulation Lab	SEC	AC			2	2	4
2501AC05	Indian Knowledge Systems	MC	FC	2			0	2
Total				**17**	**3**	**3**	**21**	**26**

VII SEMESTER

Course Code	Course Title	Course		Credits				Total Hours
		Category	Level	L	T	P	Total	
2501ME15	Mechatronics	MCC	IC	3		1	4	5
	Minor Stream-8 (or) University 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
2501AI01	Artificial Intelligence & Machine Learning Lab	SEC	AC			2	2	4
2501ME22	Summer Internship – II	SI	IC			2	2	4
Total				**15**	**0**	**5**	**20**	**25**

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
2501ME23	Full Semester Internship	PROJ	AC			12	12	24
2501ME91	Student Activity Based Learning	AEC	AC				2	
Total						**17**	**17**	**31**

Total Credit: 160

Minor Degree in Mechanical Engineering

(Offered to other branches students):

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) Mechanics of Solids	IC	3			3	50	50	100	SSP/ MP
2501ME78										
2501ME12	Heat Power Engineering (or) Refrigeration & Air Conditioning	IC	2	1		3	50	50	100	ETD
2501ME40										
2501ME75	Production Technology	IC	3			3	50	50	100	EW
2501ME76	Metallurgy and Material Science	IC	3			3	50	50	100	SSP/ MP
2501ME79	Theory of Machines (or) Advanced Engineering Metrology	AC	3			3	50	50	100	SSP/ MP
2501ME80										
	Total		**18**	**2**		**20**				

Minor Degree in Civil Engineering

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	3			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			**18**		**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
2501EE06	Electric Power Generation and Distribution Systems	IC	3			3	50	50	100	ENA-1/BEEE
2501EE13	Electrical Measurements & Instrumentation	FC	2		2	4	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**		**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	3			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			**16**		**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		100	100	JP
2501CS30		IC	2			2	50	50	100	-
2501CS18	Advanced MERN Stack Development (or) Flutter Fundamentals	AC			2	2		100	100	IMSD
2501IT12		AC			2	2	50	50	100	-
Total			**11**		**9**	**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 &	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 Title	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					PPSC
2501AI10	Natural Language Processing (or) Data Visualization	AC	2		1	3	50	50	100	DAP
2501AI19										
2501AI16	Prompt Engineering & 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) Unconventional Hydrocarbon Resources	IC	3			3	50	50	100	-
2501PT16			1	1		2				
2501PT49	Natural Gas Hydrates (or) Fundamentals of Liquefied Natural Gas	AC	2			2	50	50	100	-
2501PT05			3			3				
2501PT50	Artificial Lift Techniques (or) Enhanced Oil Recovery	AC	3			3	50	50	100	-
2501PT03			2	1		3				
2501PT12	Petroleum Refinery Engineering	AC	3			3	50	50	100	-
Total			**18**	**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			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 2501AE87	Surface Water Hydrology (or) Land & Water Management Engineering	IC	3			3	50	50	100	GWH
2501AE88 2501AE89	Agricultural Process Engineering & Food Quality (or) Post-harvest Engineering for Horticultural Produce.	AC	3			3	50	50	100	PHECC
2501AE90 2501AE91	Agricultural Machinery & Equipment (or) Design of Bio-energy systems	AC	3			3	50	50	100	FRES
Total			**20**			**20**				

Minor Degree in Entrepreneurship Development & Incubation

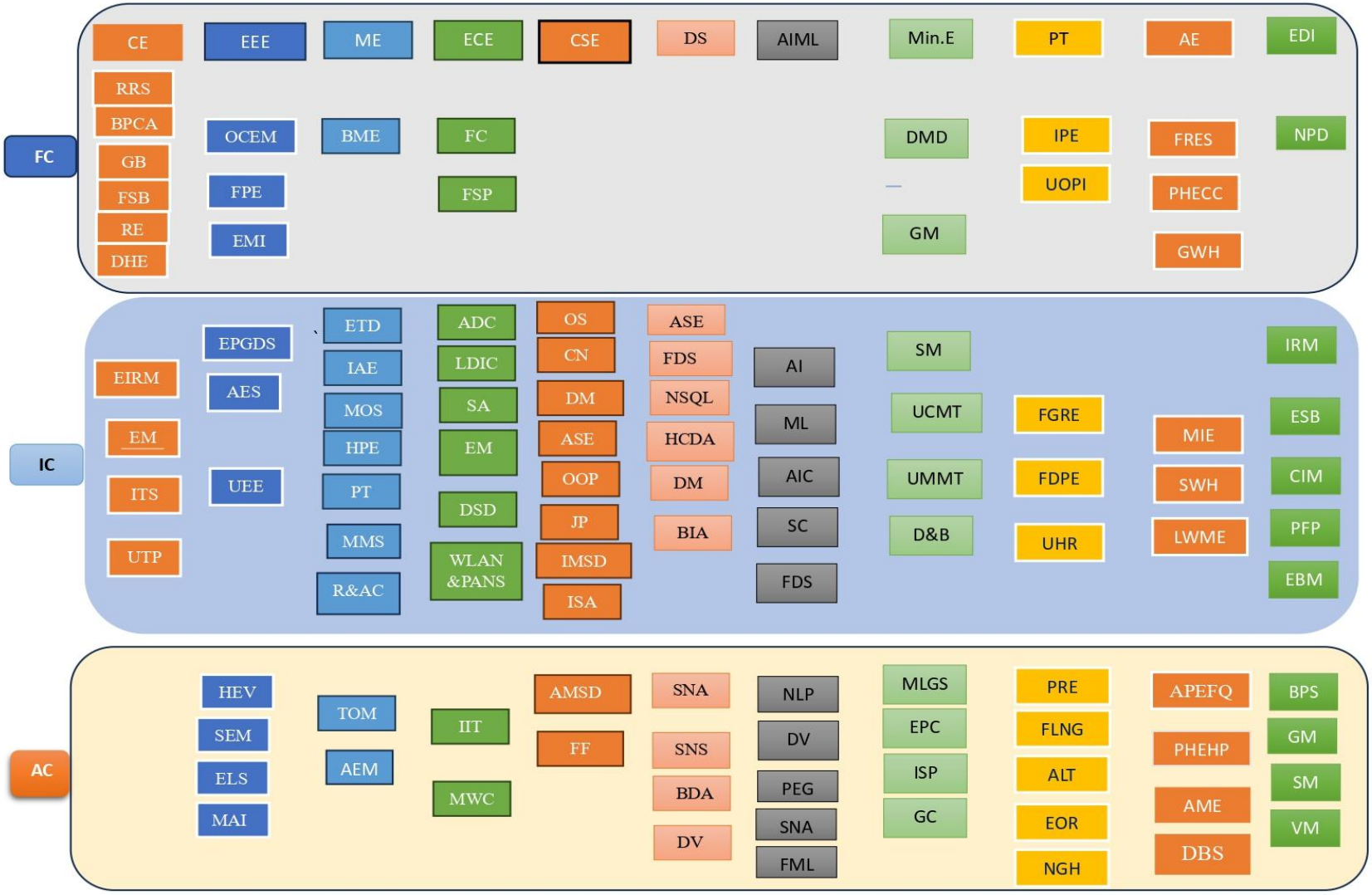
Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501MB07	New Product Development	FC	3			3	50	50	100	-
2501MB08	Entrepreneurship & Small Business Management	IC	2			2	50	50	100	-
2501MB09	Insurance & Risk Management	IC	3			3	50	50	100	-
2501MB10	Change & Innovations Management	IC	3			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



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 Microbiology		
	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 SEM	Hybrid Electric Vehicles Special Electric Machines
	EMI	Electrical Measurements & Instrumentation	UEE	Utilization of Electrical Energy		
					ELS	Electrical Safety
					MAI	Methods &Algorithms for Intelligent Control
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 LAN'S & PAN'S		
CSE			ASE	Agile 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 & Audit		
			DM	Data Mining		
DS			DM	Data Mining	SNA	Social Network Analysis
			FDS	Fundamentals of Data Science	DV	Data Visualization
			ASE	Agile Software Engineering	BDA	Big Data Analytics
			NSQL	NoSQL Databases	SNSW	Social Networks & Semantic Web
			BIA	Business Intelligence & Analytics		
			HCDA	Health Care Data Analysis		
AIML			ML	Machine Learning	DV	Data Visualization
			AI	Artificial Intelligence	PEG	Prompt Engineering & 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
Min.E	DMD	Development of Mineral Deposits	SM	Surface Mining	MLGS	Mine Legislation & General Safety
	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
PT	IPE	Introduction to Petroleum Engineering	FGRE	Fundamentals of Geology & Reservoir Engineering	PRE	Petroleum Refinery Engineering
	UOPI	Unit operations in Petroleum Industry	FDPE	Fundamentals of Drilling & Production Engineering	FLNG	Fundamentals of Liquefied Natural Gas
					NGH	Natural Gas Hydrates
			UHR	Unconventional Hydrocarbon Resources	ALT	Artificial Lift Techniques
					EOR	Enhanced Oil Recovery
Ag.E	GWH	Ground Water Hydrology	LWME	Land & 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
			MIE	Micro Irrigation Systems		
	FRES	Fundamentals of Renewable Energy Sources			AME	Agricultural Machinery & Equipment
					APEFQ	Agriculture Process Engineering & Food Quality
EDC	NPD	New Product Development	ESB	Entrepreneurship & Small Business Management	BPS	Business Policy & Strategic Management
			CIM	Change & Innovations Management	GM	Green Marketing
			PFP	Personal Financial Planning	SM	Startup Management
			EBM	E-Business Management	VM	Venture Management
			IRM	Insurance & Risk Management		