EComE- Course Baskets

[1]. Foundation - Basic Science Courses: Credits mentioned in the Program Structure. (Anyone from the basket)

1. Numerical Methods
2. Operations Research
3. Partial Differential equations
4. Discrete Mathematics
5. Analytical Chemistry
6. Semiconductor Physics
7. Wave & Optics
8. Introduction to Quantum Mechanics
9. Electrochemistry and Energy Storage
10. Characterization Methods
11. Any other course on recent development

[2]. Foundation – Engineering Courses: Credits mentioned in the Program structure.

1. Data Structures and Algorithms
2. Engineering Thermodynamics
3. Introduction to Robotics & IoT
4. Object Oriented Programming using C++
5. Any other course on recent development

[3]. Ability Enhancement Courses (AEC): Credits mentioned in the Program Structure (Any two from the basket)

1. Selling, Negotiating and Persuading Skills
2. Theatre Studies & Public Speaking
3. Resume Writing and Career Skills
4. Understanding Business
5. Soft Skills and Personality Development
6. Any other course on recent development

[4]. Skill Enhancement Courses (SEC): Credits mentioned in the Program Structure (Any three from the basket)

1. Logical Reasoning and Quantitative Analysis
2. Systems Approach
3. FEA & CFD Lab
4. GD and PI Skills
5. Problem-solving and Analytical skills
6. Coding Skills
7. Any other course on recent development

[5]. Value Added Courses (VAC): Credits mentioned in the Program Structure (Anyone from the basket)

1 Gender and Diversity
2 Global Energy: Politics, Markets and Policy
3 Indian Constitution
4 Indian Political System
5 Intellectual Property Laws
6 Principles of Management
7 Science, Technology and Public Policy
8 World Civilizations
9 Spanish
10 French
11 German
12 Japanese
13 Any other course on recent development

[6]. [Basic] Core Electives Courses

Course Name	Remarks
Semester 5	
• Control System • Design for Testability • Power Electronics	Choose Only One
Semester 6	
• System on Chip (SoC) Design • ARM controller based embedded systems • Solar Energy Management Systems • Network Architecture and Protocols	Choose any Two
Semester 7	
• Electrical Machines • Advanced Control Systems • Analysis of Electric Drives • Renewable Energy Systems	Choose any Two

[7]. Specialization Courses [Elective]

Specialization: Data Science and Artificial Intelligence	
Course Name	**Remarks**
Semester 5	
• Big Data Analytics • Soft Computing • Advanced-Data Science	Choose Only One
Semester 6	
• Natural Language Processing and Text Analytics • Data Science in Financial Markets • Biomedical Data Analysis • Deep Learning	Choose any Two
Semester 7	
• Social Network Analysis • Computer Vision • Data Science and Complex System • Audio and Speech Processing	Choose any Two

Specialization: Cyber Security	
Course Name	**Remarks**
Semester 5	
• Security Attack and Defense • Fog Computing • Cyber security tools and cyber-attacks	Choose Only one
Semester 6	
• Information retrieval and Security • Cyber Forensics • Blockchain • Security Risk Analysis	Choose any Two

Semester 7	
• Vulnerability Assessment and Penetration Testing • Security Audit • Cloud Security • Cyber Threat Intelligence	Choose any Two

Specialization: Internet of Things	
Course Name	**Remarks**
Semester 5	
• Sensor, Actuators, and Programming in IoT • Embedded System • IoT devices	Choose Only One
Semester 6	
• IoT Architecture and Protocols • Communications and Networking Technologies for IoT • Applications of IoT in Industrial, commercial, and home automation	Choose any Two
Semester 7	
• IoT Using RFID and Microcontroller • Industrial and Medical IoT • IoT in Big Data	Choose any Two

Specialization: Automobile Engineering	
Course Name	**Remarks**
Semester 5	
• Basics of Electric Vehicle Technologies • Automotive Materials and Processes • Automotive Components and Assembly Drawing	Choose Only One

Semester 6	
• Advanced Electric Vehicle Technologies • Automotive Control Engineering • Vehicle Body Engineering and Aerodynamics • Automotive Pollution Control and Alternative Fuels • Fuel Cells and Energy Storage	Choose any Two
Semester 7	
• Chassis Design and Suspension • Vehicle Dynamics • Automotive Transmission Systems • Battery Engineering • Automobile Testing	Choose any Two

Specialization: Robotics and Automation	
Course Name	**Remarks**
Semester 5	
• Drives and Control Systems • Control Theory	Choose Only One
Semester 6	
• Mechatronic Systems Design • Automation and Robotics • Digital Systems Design • Electromechanical Systems Design • Human Machine Interface	Choose any Two
Semester 7	
• Advanced Robotics • Sensors Network • Industrial Automation • Industrial Process Instrumentation	Choose any Two

• Hydraulic and Pneumatic Systems	

Specialization: VLSI Design	
Course Name	**Remarks**
Semester 5	
• Hardware Modeling using Verilog • VLSI Digital Signal Processing System	Choose Only One
Semester 6	
• Low Power VLSI Circuits • VLSI Test and Testability • CAD for VLSI	Choose any Two
Semester 7	
• Analog VLSI Design • System on Chip Design • Network on Chip	Choose any Two