JOGINPALLY B.R. ENGINEERING COLLEGE

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE OUTCOMES (COs)

M.Tech. I Year I Sem R19 Syllabus Computer Science and Engineering

Course Code	Course Title / Name	Course Outcomes
Professional Core - I	Mathematical Foundations of Computer Science	**At the end of this course, each student should be able to:** **CO1:** To understand the basic notions of discrete and continuous probability. **CO2:** To understand the methods of statistical inference, and the role that sampling distributions play in those methods. **CO3:** To be able to perform correct and meaningful statistical analyses of simple to moderate complexity.
Professional Core - II	Advanced Data Structures	**At the end of this course, each student should be able to:** **CO1:** Understand the implementation of symbol table using hashing techniques.. **CO2:** Develop algorithms for text processing applications. **CO3:** Identify suitable data structures and develop algorithms for computational geometry problems.
Professional Elective - I	Information Security	**At the end of this course, each student should be able to:** **CO1:** Demonstrate the knowledge of cryptography, network security concepts and applications. **CO2:** Ability to apply security principles in system design. **CO3:** Ability to identify and investigate

		vulnerabilities and security threats and mechanisms to counter them.
Professional Elective - I	Mobile Application Development	**At the end of this course, each student should be able to:** **CO1:** Student understands the working of Android OS Practically. **CO2:** Student will be able to develop Android user interfaces **CO3:** Student will be able to develop, deploy and maintain the Android Applications.
Professional Elective - I	Machine Learning	**At the end of this course, each student should be able to:** **CO1:** Extract features that can be used for a particular machine learning approach in various IOT applications. **CO2:** To compare and contrast pros and cons of various machine learning techniques and to get an insight of when to apply a particular machine learning approach. **CO3:** To mathematically analyse various machine learning approaches and paradigms.
Professional Elective - II	Network Security	**At the end of this course, each student should be able to:** **CO1:** To understand basics of security and issues related to it. **CO2:** Understanding of biometric techniques available and how they are used in today's world. **CO3:** Security issues in web and how to tackle them. **CO4:** Learn mechanisms for transport and network security.
Professional Elective - II	Cloud Computing	**At the end of this course, each student should be able to:** **CO1:** Identify security aspects of each cloud model **CO2:** Develop a risk-management strategy for moving to the Cloud **CO3:** Implement a public cloud instance using a public cloud service provider

		CO4: Apply trust-based security model to different layer
Professional Elective - II	Data Mining	**At the end of this course, each student should be able to:** **CO1:** Ability to perform the preprocessing of data and apply mining techniques on it. **CO2:** Ability to identify the association rules, classification and clusters in large data sets. **CO3:** Ability to solve real world problems in business and scientific information using data mining **CO4:** Ability to classify web pages, extracting knowledge from the web
Lab - I	Advanced Data Structures Lab	**At the end of this course, each student should be able to:** **CO1:** Ability to select the data structures that efficiently model the information in a problem. **CO2:** Ability to assess efficiency trade-offs among different data structure implementations or combinations. **CO3:** Implement and know the application of algorithms for sorting and pattern matching. **CO4:** Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and B-trees.
Lab - II	Machine Learning Lab	**At the end of this course, each student should be able to:** **CO1:** Understand complexity of Machine Learning algorithms and their limitations; **CO2:** Understand modern notions in data analysis-oriented computing; **CO3:** Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own; **CO4:** Be capable of performing experiments in Machine Learning using real-world data.

	Research Methodology & IPR	**At the end of this course, each student should be able to:** **CO1:** Understand research problem formulation. **CO2:** Analyze research related information **CO3:** Follow research ethics **CO4:** Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity. **CO5:** Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular. **CO6:** Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.
Audit - I	**Audit Course - I**	

M.Tech. I Year II Sem R19 Syllabus Computer Science and Engineering

Course Code	Course Title / Name	Course Outcomes
Professional Core - III	Advanced Algorithms	**At the end of this course, each student should be able to:** **CO1:** Analyze the complexity/performance of different algorithms. **CO2:** Determine the appropriate data structure for solving a particular set of problems. **CO3:** Categorize the different problems in various classes according to their complexity. **CO4:** Students should have an insight of recent activities in the field of the advanced data structure.
Professional Core - IV	Advanced Computer Architecture	**At the end of this course, each student should be able to:** **CO1:** Computational models and Computer Architectures. **CO2:** Concepts of parallel computer models. **CO3:** Scalable Architectures, Pipelining, Superscalar processors, multiprocessors
Professional Elective - III	Web and Database Security	**At the end of this course, each student should be able to:** **CO1:** Understand the Web architecture and applications **CO2:** Understand client side and service side programming **CO3:** Understand how common mistakes can be bypassed and exploit the application **CO4:** Identify common application vulnerabilities
Professional Elective - III	Internet of Things	**At the end of this course, each student should be able to:** **CO1:** Interpret the impact and challenges posed by IoT networks leading to new architectural models. **CO2:** Compare and contrast the deployment of smart objects and the technologies to connect them to network.

		CO3: Appraise the role of IoT protocols for efficient network communication. **CO4:** Elaborate the need for Data Analytics and Security in IoT. **CO5:** Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.
Professional Elective - III	Data Science	**At the end of this course, each student should be able to:** **CO1:** Explain how data is collected, managed and stored for data science; **CO2:** Understand the key concepts in data science, including their real-world applications and the toolkit used by data scientists **CO3:** Implement data collection and management scripts using MongoDB
Professional Elective - IV	Cyber Security	**At the end of this course, each student should be able to:** **CO1:** Analyze and resolve security issues in networks and computer systems to secure an IT infrastructure. **CO2:** Design, develop, test and evaluate secure software. **CO3:** Develop policies and procedures to manage enterprise security risks. **CO4:** Evaluate and communicate the human role in security systems with an emphasis on ethics, social engineering vulnerabilities and training. **CO5:** Interpret and forensically investigate security incidents.
Professional Elective - IV	Advanced Computer Networks	**At the end of this course, each student should be able to:** **CO1:** Understanding of holistic approach to computer networking **CO2:** Ability to understand the computer networks and their application **CO3:** Ability to design simulation concepts related to

		packet forwarding in networks
Professional Elective - IV	Big Data Analytics	**At the end of this course, each student should be able to:** **CO1:** Identify Big Data and its Business Implications. **CO2:** List the components of Hadoop and Hadoop Eco-System **CO3:** Access and Process Data on Distributed File System **CO4:** Manage Job Execution in Hadoop Environment **CO5:** Develop Big Data Solutions using Hadoop Eco System **CO6:** Analyze Infosphere BigInsights Big Data Recommendations. **CO7:** Apply Machine Learning Techniques using R.
Lab - III	Advanced Algorithms Lab	**At the end of this course, each student should be able to:** **CO1:** Design and analyze programming problem statements. **CO2:** Choose appropriate data structures and algorithms, understand the ADT/libraries, and use it to design algorithms for a specific problem. **CO3:** Understand the necessary mathematical abstraction to solve problems. **CO4:** Come up with analysis of efficiency and proofs of correctness **CO5:** Comprehend and select algorithm design approaches in a problem specific manner.
Lab - IV	Data Science Lab	**At the end of this course, each student should be able to:** **CO1:** Students will develop relevant programming abilities. **CO2:** Students will demonstrate proficiency with statistical analysis of data. **CO3:** Students will develop the ability to build and assess data-based models. **CO4:** Students will execute statistical analyses with professional statistical software.

		CO5: Students will demonstrate skill in data management. **CO6:** Students will apply data science concepts and methods to solve problems in real-world contexts and will communicate these solutions effectively
	Mini Project with Seminar	**At the end of this course, each student should be able to:** **CO1:** Demonstrate a sound technical knowledge of their selected mini project topic. **CO2:** Undertake problem identification, formulation and solution. **CO3:** Design engineering solutions to complex problems utilising a systems approach. **CO4:** Communicate with engineers and the community at large. **CO5:** Demonstrate the knowledge, skills and attitudes of a professional engineer
Audit - II	**Audit Course - II**	

M.Tech. II Year III Sem R19 Syllabus Computer Science and Engineering

Course Code	Course Title / Name	Course Outcomes
Professional Elective - V	Digital Forensics	**At the end of this course, each student should be able to:** **CO1:** Understand relevant legislation and codes of ethics. **CO2:** Computer forensics and digital detective and various processes, policies and procedures. **CO3:** E-discovery, guidelines and standards, E-evidence, tools and environment. **CO4:** Email and web forensics and network forensics.
Professional Elective - V	High Performance Computing	**At the end of this course, each student should be able to:** **CO1:** Understanding the concepts in grid computing **CO2:** Ability to set up cluster and run parallel applications **CO3:** Ability to understand the cluster projects and cluster OS **CO4:** Understanding the concepts of pervasive computing & quantum computing.
Professional Elective - V	Deep Learning	**At the end of this course, each student should be able to:** **CO1:** Ability to understand the concepts of Neural Networks **CO2:** Ability to select the Learning Networks in modeling real world systems **CO3:** Ability to use an efficient algorithm for Deep Models **CO4:** Ability to apply optimization strategies for large scale applications
Open Elective	**Open Elective**	

LIST OF AUDIT COURSE-I & II OFFERED FOR R19 M.TECH PROGRAMMES (CSE, EEE)

Course Code	Course Title / Name	Course Outcomes
Audit Course I & II	English for Research Paper Writing	**At the end of this course, each student should be able to:** **CO1:** Understand relevant legislation and codes of ethics. **CO2:** Computer forensics and digital detective and various processes, policies and procedures. **CO3:** E-discovery, guidelines and standards, E-evidence, tools and environment. **CO4:** Email and web forensics and network forensics.
Audit Course I & II	Disaster Management	**At the end of this course, each student should be able to:** **CO1:** Understanding the concepts in grid computing **CO2:** Ability to set up cluster and run parallel applications **CO3:** Ability to understand the cluster projects and cluster OS **CO4:** Understanding the concepts of pervasive computing & quantum computing.
Audit Course I & II	Sanskrit for Technical Knowledge	**At the end of this course, each student should be able to:** **CO1:** Understanding basic Sanskrit language **CO2:** Ancient Sanskrit literature about science & technology can be understood **CO3:** Being a logical language will help to develop logic in students
Audit Course I & II	Value Education	**At the end of this course, each student should be able to:** **CO1:** Knowledge of self-development **CO2:** Learn the importance of Human values **CO3:** Developing the overall personality
Audit Course I & II	Constitution of India	**At the end of this course, each student should be able to:** **CO1:** Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.

		CO2: Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India. **CO3:** Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution. **CO4:** Discuss the passage of the Hindu Code Bill of 1956.
Audit Course I & II	Pedagogy Studies	**At the end of this course, each student should be able to:** **CO1:** What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries? **CO2:** What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners? **CO3:** How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?
Audit Course I & II	Stress Management by yoga	**At the end of this course, each student should be able to:** **CO1:** Develop healthy mind in a healthy body thus improving social health also **CO2:** Improve efficiency
Audit Course I & II	Personality Development Through Life Enlightenment Skills	**At the end of this course, each student should be able to:** **CO1:** Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life **CO2:** The person who has studied Geeta will lead the nation and mankind to peace and prosperity **CO3:** Study of Neetishatakam will help in developing versatile personality of students

LIST OF OPEN ELECTIVES OFFERED FOR R19 M.TECH PROGRAMMES (CSE,EEE)

Course Code	Course Title / Name	Course Outcomes
Open Elective	Numerical methods	**At the end of this course, each student should be able to:** **CO1:** Know the approximations in any calculations and solutions to equations **CO2:** Solve simultaneous equations using matrix methods **CO3:** Calculate differentiation and integration problems using numerical methods **CO4:** Solve ordinary and partial differential equations
Open Elective	Construction Management	**At the end of this course, each student should be able to:** **CO1:** Plan, coordinate and control of project from beginning to completion. **CO2:** Distinguish different types of contracts that can be used for a project **CO3:** Adopt the most effect method for meeting the requirement in order to produce a functionally and financially viable project.
Open Elective	Finite Element Methods	**At the end of this course, each student should be able to:** **CO1:** To understand the fundamental theory of the Finite Element Method **CO2**: To apply the Finite Element theory to solve soil behavior under external loads.
Open Elective	Artificial Intelligence: Techniques	**At the end of this course, each student should be able to:** **CO1:** Asses the applicability, strengths and weakness of problems and methods for particular engineering problem. **CO2:** Develop intelligent system for particular problem. **CO3:** Understand the concepts of Fuzzy logic, Applications in water resource engineering.
Open Elective	Operation Research	**At the end of this course, each student should be able to:** **CO1:** Apply the dynamic programming to solve

		problems of discreet and continuous variables. **CO2:** Apply the concept of non-linear programming **CO3:** Carry out sensitivity analysis **CO4:** Model the real-world problem and simulate it.
Open Elective	Industrial Safety	**At the end of this course, each student should be able to:** **CO1:** Know how to take safety measures in executing works **CO2:** Identify the need for maintenance (or) replacement of equipment **CO3:** Understand the need for periodic and preventive maintenance
Open Elective	Environmental Legislation & Audit	**At the end of this course, each student should be able to:** **CO1:** Interpret the Environment Protection (EP) Act 1986. **CO2:** Interpret the Water Act 1974 and Water Cess Act **CO3:** Interpret the Air Act 1981. **CO4:** Interpret the Hazardous waste Act 1989 **CO5:** Analyze the 'Environmental Audit' done of an Industry and debate the method used to do so. **CO6:** Undertake Environmental Audit
Open Elective	GIS & IoT For Planning & Policy Making for Smart Cities/Urban Areas	**At the end of this course, each student should be able to:** **CO1:** The importance of National and International policies for smart cities **CO2:** Applications of with GIS for urban cities. **CO3:** Applications of IoT for smart cities **CO3:** The concepts of GIS and IoT at analytics level. **CO4:** Applications of IoT and GIS to reduce congestion and pollution in urban cities.
Open Elective	Disaster Management	**At the end of this course, each student should be able to:** **CO1:** Understanding Disasters, man-made Hazards and Vulnerabilities. **CO2:** Understanding disaster management mechanism. **CO3:** Understanding capacity building concepts

		and planning of disaster managements.
Open Elective	Disaster Analytics	**At the end of this course, each student should be able to:** **CO1:** Understand the various disasters and their impact **CO2:** Understand the urban policies related to disaster **CO3:** Find methods to monitor disasters **CO4:** Understand ways to quantify and plan infrastructure **CO5:** Understand the concepts of Mapping and measuring disasters
Open Elective	Principles of Automation	**At the end of this course, each student should be able to:** **CO1:** Explain various reasons for employing automation in a manufacturing environment and describe various applications. **CO2:** Describe the basic function of a sensor and an actuator in an automated system and give examples of both categories. **CO3:** Select an appropriate sensor and/or actuator for a given automated application. **CO4:** Describe the fundamentals of NC technology. **CO5:** Use a Programmable Logic Controller (PLC) and embedded microcontroller, to perform specified control functions. **CO6:** Describe the basic anatomy and attributes of an industrial robot. **CO7:** Identify and distinguish the different components and interfaces in a Flexible Manufacturing System. **CO8:** Troubleshoot a system and take appropriate action(s) to resolve the issue(s). **CO9:** Design an automated system to meet defined operational specifications.
Open Elective	Artificial Neural Networks	**At the end of this course, each student should be able to:** **CO1:** To understand artificial neural network models and their training algorithms

		CO2: To understand the concept of fuzzy logic system components, fuzzification and defuzzification **CO3:** Applies the above concepts to real-world problems and applications.
Open Elective	Fundamentals of Nano Technology	**At the end of this course, each student should be able to:** **CO1:** To understand the evolution of Nano systems, and various fabrication techniques. **CO2:** Learn about nano materials and various nano measurements techniques.
Open Elective	Concurrent Engineering	**At the end of this course, each student should be able to:** **CO1:** Understand the need of concurrent engineering and strategic approaches for product design. **CO2:** Apply concurrent design principles to product design. **CO3:** Design assembly workstation using concepts of simultaneous engineering. **CO4:** Design automated fabricated systems – Case studies.
Open Elective	Mechanics of Composite Materials	**At the end of this course, each student should be able to:** **CO1:** Understanding of types, manufacturing processes, and applications of composite materials. **CO2:** Basic understanding of linear elasticity with emphasis on the difference between isotropic and anisotropic material behavior. **CO3:** Ability to analyze problems on macro and micro mechanical behavior of lamina **CO4:** Ability to analyze problems on macro mechanical behavior of laminate **CO5:** An ability to predict the loads and moments that cause an individual composite layer and a composite laminate to fail and to compute hygro thermal loads in composites. **CO6:** An ability to compute the properties of a composite laminate with any stacking

		sequence.
Open Elective	Waste to Energy	**At the end of this course, each student should be able to:** Understood and acquired fundamental knowledge on the science and engineering of energy technologies and systems. Acquired the expertise and skills required for energy auditing and management, economical calculation of energy cost, development, implementation, maintenance of energy systems. Become capable of analysis and design of energy conversion systems. Acquired skills in the scientific and technological communications and project preparation, planning and implementation of energy projects
Open Elective	Concurrent Engineering	**At the end of this course, each student should be able to:** **CO1:** Understand the need of concurrent engineering and strategic approaches for product design. **CO2:** Apply concurrent design principles to product design. **CO3:** Design assembly workstation using concepts of simultaneous engineering. **CO4:** Design automated fabricated systems – Case studies.
Open Elective	Principles of Automation	**At the end of this course, each student should be able to:** **CO1:** Understand characteristics, and working principle of different types of Power electronic devices and their applications. **CO2:** Analyse the various Triggering and Commutation methods of Thyristors. **CO3:** Describe the working of Choppers, Inverters and cycloconverter circuits and their applications. **CO4:** Select Thyristors circuits for various industrial / controlled applications. **CO5:** Understand basic concepts of PLC and develop application programs. **CO6:** Identify and interpret the functionality of DCS

		and various elements of SCADA.
Open Elective	Entrepreneurship	**At the end of this course, each student should be able to:** **CO1:** To assess the commercial viability of a new technology-based idea. The candidate can use various methods and tools for this purpose. **CO2:** To transform research-based ideas into feasibility and business plans. The candidate can use (tacit and explicit) methods and tools for this purpose. **CO3:** To present new ideas to the market. **CO4:** To assess the need for innovation, initiate the process and run innovations in organizations. **CO5:** To seize opportunities, organize and finance viable initiatives through to fruition.
Open Elective	Optimization Techniques & Applications	**At the end of this course, each student should be able to:** **CO1:** Apply appropriate optimization techniques and solve optimization problem like single variable or multivariable **CO2:** Make sensitivity analysis to study effect of changes in parameters of LPP on the optimal solution without reworking. **CO3:** Simulate the system to estimate specified performance measures. **CO4:** Solve integer programming problem by either geometry cutting plane algorithm or branch band method. **CO5:** Apply chance constrained algorithm and solve stochastic linear programme. **CO6:** Formulate GP model and solve it. **CO7:** Solve given optimization problem by genetic algorithm or simulated annealing or PSO.
Open Elective	Advanced Finite Element and Boundary Element Methods	**At the end of this course, each student should be able to:** **CO1:** Understand the background of mathematical equations used for development of modeling software modules to develop the various structural related applications

		CO2: Identify mathematical model for solution of common engineering problems. **CO3:** Solve structural, thermal, fluid flow problems. **CO4:** Use professional-level finite element software to solve engineering problems in Solid mechanics, fluid mechanics and heat transfer.
Open Elective	Fundamentals of Production Engineering	**At the end of this course, each student should be able to:** **CO1:** Acquire fundamental knowledge and understanding of Production and Industrial Engineering. **CO2:** Acquire abilities and capabilities in the areas of advanced manufacturing methods, quality assurance and shop floor management. **CO3:** Formulate relevant research problems; conduct experimental and/or analytical work and analyzing results using modern mathematical and scientific methods. **CO4:** Review and document the knowledge developed by scholarly predecessors and critically assess the relevant technological issues. **CO5:** Design and validate technological solutions to defined problems and write clearly and effectively for the practical utilization of their work.
Open Elective	Testing & Evaluation	**At the end of this course, each student should be able to:** **CO1:** Explain central concepts and issues in language testing, such as basic types of language tests (and their specific features). **CO2:** Explain central concepts and issues in evaluation of language proficiency. **CO3:** Understand the key principles of test construction and validation, and apply them in the development of a specific language test. **CO4:** Administer a language test and analyse its results. **CO5:** Appraise validity and reliability aspects of

		language testing.
Open Elective	Basics of Refrigeration Systems	**At the end of this course, each student should be able to:** **CO1:** Illustrate the basic concepts of refrigeration system. **CO2:** Analyze the vapour compression cycle and interpret the usage of refrigerants. **CO3:** Explain the components of vapour absorption system. **CO4:** Demonstrate the use of refrigerants. **CO5:** Discuss the theory Ozone depletion potential and global warming potential.
Open Elective	Introduction to Thermal Storage Systems	**At the end of this course, each student should be able to:** **CO1:** To be able to state the types-energy storage devices – comparison of energy storage technologies. **CO2:** To be able to identify and describe Basic concepts and modeling of heat storage units – modeling of simple water and rock bed storage system. **CO3:** To be able to explain at a level understandable by a non-technical person how various Parallel flow and counter flow regenerators. **CO4:** To be able to calculate Modeling of phase change problems. **CO5:** To be able to explain greenhouse heating – power plant applications – drying and heating for process industries.
Open Elective	Cogeneration & Waste Heat Recovery Systems	**At the end of this course, each student should be able to:** **CO1:** Analyze the basic energy generation cycles **CO2:** Do the economic analysis of waste heat recovery systems
Open Elective	Business Analytics	**At the end of this course, each student should be able to:** **CO1:** Students will demonstrate knowledge of data analytics. **CO2:** Students will demonstrate the ability of think critically in making decisions based on data

		and deep analytics. **CO3:** Students will demonstrate the ability to use technical skills in predicative and prescriptive modeling to support business decision-making. **CO4:** Students will demonstrate the ability to translate data into clear, actionable insights.
Open Elective	Industrial Safety	**At the end of this course, each student should be able to:** **CO1:** Know how to take safety measures in executing works **CO2:** Identify the need for maintenance (or) replacement of equipment **CO3:** Understand the need for periodic and preventive maintenance
Open Elective	Operations Research	**At the end of this course, each student should be able to:** **CO1:** Students should able to apply the dynamic programming to solve problems of discreet and continuous variables. **CO2:** Students should able to apply the concept of non-linear programming **CO3:** Students should able to carry out sensitivity analysis **CO4:** Student should able to model the real-world problem and simulate it.
Open Elective	Cost Management of Engineering Projects	**At the end of this course, each student should be able to:** **CO1:** Understand project characteristics and various stages of a project. **CO2:** Understand the conceptual clarity about project organization and feasibility analyses – Market, Technical, Financial and Economic. **CO3:** Analyze the learning and understand techniques for Project planning, scheduling and Execution Control. **CO4:** Apply the risk management plan and analyse the role of stakeholders. **CO5:** Understand the contract management, Project

		Procurement, Service level Agreements and productivity. **CO6:** Understand the How Subcontract Administration and Control are practiced in the Industry.
Open Elective	Composite Materials	**At the end of this course, each student should be able to:** **CO1:** Explain the mechanical behavior of layered composites compared to isotropic materials. **CO2:** Apply constitutive equations of composite materials and understand mechanical behavior at micro and macro levels. **CO3:** Determine stresses and strains relation in composites materials.
Open Elective	Energy from Waste	**At the end of this course, each student should be able to:** **CO1:** Apply the knowledge about the operations of Waste to Energy Plants. **CO2:** Analyse the various aspects of Waste to Energy Management Systems. **CO3:** Carry out Techno-economic feasibility for Waste to Energy Plants. **CO4:** Apply the knowledge in planning and operations of Waste to Energy plants.