Department	ECE
Course Code	MCE 101
Title of Course	Advanced Communication Network
Nature of Course	Compulsory
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	CO1: Understand advanced concepts in Communication Networking. CO2: Design and develop protocols for Communication Networks. CO3: Understand the mechanisms in Quality of Service in networking. CO4: Optimise the Network Design

Department	ECE
Course Code	MCE 102
Title of Course	Wireless and Mobile Communication
Nature of Course	Compulsory
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	CO1: Design appropriate mobile communication systems. CO2: Apply frequency-reuse concept in mobile communications, and to analyze its effects on interference, system capacity, handoff techniques CO3: Distinguish various multiple-access techniques for mobile communications e.g. FDMA, TDMA, CDMA, and their advantages and disadvantages. CO4: Analyze path loss and interference for wireless telephony and their influences on a mobilecommunication system's performance. CO5: Analyze and design CDMA system functioning with knowledge of forward and reverse channel details, advantages and disadvantages of using the technology CO6: Understanding upcoming technologies like 3G, 4G etc.

Department	ECE
Course Code	MCE 103
Title of Course	Wireless Sensor Networks
Nature of Course	Program Elective-I
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	CO1: Design wireless sensor network system for different applications under consideration. CO2: Understand the hardware details of different types of sensors and select right type of sensor for various applications. CO3: Understand radio standards and communication protocols to be used for wireless sensor network-based systems and application. CO4: Use operating systems and programming languages for wireless sensor nodes, performance of wireless sensor networks systems and platforms. CO5: Handle special issues related to sensors like energy conservation and security challenges.

Department	ECE
Course Code	MCE 103
Title of Course	Optical Networks
Nature of Course	Program Elective-I
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34

Course Outcomes	CO1: Contribute in the areas of optical network and WDM network design. CO2: Implement simple optical network and understand further technology developments for future enhanced network.

Department	ECE
Course Code	MCE 103
Title of Course	Statistical Information Processing
Nature of Course	Program Elective-I
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	CO1: Characterize and apply probabilistic techniques in modern decision systems, such as information systems, receivers, filtering and statistical operations. CO2: Demonstrate mathematical modelling and problem solving using such models. CO3: Comparatively evolve key results developed in this course for applications to signal processing, communications systems. CO4: Develop frameworks based in probabilistic and stochastic themes for modelling and analysis of various systems involving functionalities in decision making, statistical inference, estimation and detection.

Department	ECE
Course Code	MCE 104
Title of Course	Cognitive Radio
Nature of Course	Program Elective-II
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	CO1: Understand the fundamental concepts of cognitive radio networks. CO2: Develop the cognitive radio, as well as techniques for spectrum holes detection that cognitive radio takes advantages in order to exploit it. CO3: Understand technologies to allow an efficient use of TVWS for radio communications based on two spectrum sharing business models/policies. CO4: Understand fundamental issues regarding dynamic spectrum access, the radio-resource management and trading, as well as a number of optimisation techniques for better spectrum exploitation.

Department	ECE
Course Code	MCE 104
Title of Course	RF and Microwave Circuit Design
Nature of Course	Program Elective-II
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	CO1: Understand the behaviour of RF passive components and model active components. CO2: Perform transmission line analysis. CO3: Demonstrate use of Smith Chart for high frequency circuit design. CO4: Justify the choice/selection of components from the design aspects. CO5: Contribute in the areas of RF circuit design.

Department	ECE
Course Code	MCE 104
Title of Course	DSP Architecture
Nature of Course	Program Elective-II
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	CO1 Identify and formalize architectural level characterization of P-DSP hardware CO2: Ability to design, programming (assembly and C), and testing code using Code Composer Studio environment CO3: Deployment of DSP hardware for Control, Audio and Video Signal processing applications CO4: Understanding of major areas and challenges in DSP based embedded systems

Department	ECE
Course Code	MCE 105
Title of Course	Research Methodology and IPR
Nature of Course	Compulsory
Type of Course	Lectures
Contact Hours	2L+0T
Total Contact Hours	34
Course Outcomes	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.

Department	ECE
Course Code	MCE 106A
Title of Course	ENGLISH FOR RESEARCH PAPER WRITING
Nature of Course	Elective
Type of Course	Lectures
Contact Hours	2L+0T
Total Contact Hours	24
Course Outcomes	CO1: Understand that how to improve your writing skills and level of readability CO2: Learn about what to write in each section CO3: Understand the skills needed when writing a Title

Department	ECE
Course Code	MCE 106B
Title of Course	PEDAGOGY STUDIES
Nature of Course	Elective
Type of Course	Lectures
Contact Hours	2L+0T
Total Contact Hours	16
Course Outcomes	CO1: Review existing evidence on the review topic to inform programme design and policy making undertaken by the DfID, other agencies and researchers. CO2: Identify critical evidence gaps to guide the development.

Department	ECE
Course Code	MCE 106C
Title of Course	VALUE EDUCATION
Nature of Course	Elective
Type of Course	Lectures
Contact Hours	2L+0T
Total Contact Hours	22
Course Outcomes	CO1: Understand value of education and self- development CO2: Imbibe good values in students CO3: Let the should know about the importance of character

Department	ECE
Course Code	MCE 106D
Title of Course	STRESS MANAGEMENT BY YOGA
Nature of Course	Elective
Type of Course	Lectures
Contact Hours	2L+0T
Total Contact Hours	24
Course Outcomes	CO1: To achieve overall health of body and mind CO2: To overcome stress

Department	ECE
Course Code	MCE 191
Title of Course	Advanced Communication Networks Lab
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	0L+0T+4P
Total Contact Hours	44

Course Outcomes	CO1: Identify the different types of network devices and their functions within a network. CO2: Understand and build the skills of sub-netting and routing mechanisms. CO3: Understand basic protocols of computer networks, and how they can be used to assist in network design and implementation.

Department	ECE
Course Code	MCE 192
Title of Course	Wireless and Mobile Communication Lab
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3L+0T+4P
Total Contact Hours	32
Course Outcomes	CO1: Understanding Cellular concepts, GSM and CDMA networks CO2: To study GSM handset by experimentation and fault insertion techniques CO3: Understating of 3G communication system by means of various AT commands usage in GSM CO4: Understanding CDMA concept using DSSS kit CO5: To learn, understand and develop concepts of Software Radio in real time environment

Department	ECE
Course Code	MCE 201
Title of Course	Antennas and Radiating Systems
Nature of Course	Compulsory
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact	34

Hours	
Course Outcomes	CO1: Compute the far field distance, radiation pattern and gain of an antenna for given current distribution. CO2: Estimate the input impedance, efficiency and ease of match for antennas. CO3: Compute the array factor for an array of identical antennas. CO4: Design antennas and antenna arrays for various desired radiation pattern characteristics.

Department	ECE
Course Code	MCE 202
Title of Course	Advanced Digital Signal Processing
Nature of Course	Compulsory
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1. To understand theory of different filters and algorithms 2. To understand theory of multi-rate DSP, solve numerical problems and write algorithms 3. To understand theory of prediction and solution of normal equations 4. To know applications of DSP at block level.

Department	ECE
Course Code	MCE 203
Title of Course	Satellite Communication
Nature of Course	Program Elective-III

Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1. Visualize the architecture of satellite systems as a means of high speed, high range communication system. 2. State various aspects related to satellite systems such as orbital equations, sub-systems in a satellite, link budget, modulation and multiple access schemes. 3. Solve numerical problems related to orbital motion and design of link budget for the given parameters and conditions.

Department	ECE
Course Code	MCE 203
Title of Course	Internet of things
Nature of Course	Program Elective-III
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1. Understand what IOT technologies are used for today and what is required in certain scenarios. 2. Understand the types of technologies that are available and in use today and can be utilized to implement IOT solutions. 3. Apply these technologies to tackle scenarios in teams of using an experimental platform for implementing prototypes and testing them as running applications.

Department	ECE
Course Code	MCE 203
Title of Course	Voice and Data Networks
Nature of Course	Program Elective-III
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1. Protocol, algorithms, trade-offs rationale. 2. Routing, transport, DNS resolutions 3. Network extensions and next generation architectures.

Department	ECE
Course Code	MCE 204
Title of Course	Markov Chains and Queuing Systems
Nature of Course	Program Elective-IV
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1. Understand Markov Chains and regenerative processes used in modelling a wide variety ofsystems and phenomena. 2. Model a system as queuing system with some aspect of the queue governed by a randomprocess. 3. Understand telecommunication systems modelling using Markov chains with special emphasison developing queuing models.

Department	ECE
Course Code	MCE 204
Title of Course	MIMO Systems
Nature of Course	Program Elective-IV
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact	34

Hours	
Course Outcomes	1. Understand channel modelling and propagation, MIMO Capacity, space-time coding, MIMOreceivers, MIMO for multi-carrier systems (e.g. MIMO-OFDM), multi-user communications,multi-user MIMO. 2. Understand cooperative and coordinated multi-cell MIMO, introduction to MIMO in 4G (LTE,LTE-Advanced, WiMAX). 3. Perform Mathematical modelling and analysis of MIMO systems.

Department	ECE
Course Code	MCE 204
Title of Course	Programmable Networks - SDN, NFV
Nature of Course	Program Elective-IV
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1. Understand advanced concepts in Programmable Networks. 2. Understand Software Defined Networking, an emerging Internet architectural framework. 3. Implement the main concepts, architectures, algorithms, protocols and applications in SDN and NFV.

Department	ECE
Course Code	MCE 205A
Title of Course	PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS
Nature of Course	Elective
Type of Course	Lectures

Contact Hours	2L+0T
Total Contact Hours	24
Course Outcomes	1. Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life 2. The person who has studied Geeta will lead the nation and mankind to peace and prosperity 3. Study of Neetishatakam will help in developing versatile personality

Department	ECE
Course Code	MCE 205B
Title of Course	SANSKRIT FOR TECHNICAL KNOWLEDGE
Nature of Course	Elective
Type of Course	Lectures
Contact Hours	2L+0T
Total Contact Hours	24
Course Outcomes	1. Understanding basic Sanskrit language 2. Ancient Sanskrit literature about science & technology can be understood 3. Being a logical language will help to develop logic in students

Department	ECE
Course Code	MCE 205C
Title of Course	CONSTITUTION OF INDIA
Nature of Course	Elective
Type of Course	Lectures
Contact Hours	2L+0T
Total Contact Hours	24
Course Outcomes	1. Discuss the growth of the demand for civil rights in India for the bulk of Indians before thearrival of Gandhi in Indian politics. 2. Discuss the intellectual origins of the framework of argument that informed theconceptualization of social reforms leading to revolution in India. 3. 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. 4. Discuss the passage of the Hindu Code Bill of 1956.

Department	ECE
Course Code	MCE 205D
Title of Course	DISASTER MANAGEMENT
Nature of Course	Elective
Type of Course	Lectures
Contact Hours	2L+0T
Total Contact Hours	24
Course Outcomes	1. learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response. 2. critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives. 3. develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations. 4. critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in.

Department	ECE
Course Code	MCE 291
Title of Course	Antennas and Radiating Systems Lab
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	0L+0T+4P
Total Contact Hours	36
Course Outcomes	1. Determine specifications, design, construct and test antenna. 2. Explore and use tools for designing, analysing and testing antennas. These tools include Antenna design and analysis software, network analysers, spectrum analysers, and antenna pattern measurement techniques.

Department	ECE
Course Code	MCE 292
Title of Course	Advanced Digital Signal Processing lab
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3L+0T+4P
Total Contact Hours	40
Course Outcomes	1. Design different digital filters in software 2. Apply various transforms in time and frequency 3. Perform decimation and interpolation

Department	ECE
Course Code	MCE 281
Title of Course	Mini Project with Seminar
Nature of Course	Compulsory
Type of Course	Sessional
Contact Hours	0L+0T+3P
Total Contact Hours	30
Course Outcomes	CO1. Conceive a problem statement either from rigorous literature survey or from the requirements raised from need analysis. CO2. Design, implement and test the prototype/algorithm in order to solve the conceived problem. CO3. Write comprehensive report on mini project work

Department	ECE
Course Code	MCE 301A
Title of Course	High Performance Networks
Nature of Course	Program Elective-V
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1.Apply knowledge of mathematics, probability, and statistics to model and analyze some networking protocols. 2.Design, implement, and analyze computer networks. 3.Identify, formulate, and solve network engineering problems. 4.Show knowledge of contemporary issues in high performance computer networks.Use techniques, skills, and modern networking tools necessary for engineering practice.

Department	ECE
Course Code	MCE 301B
Title of Course	Pattern Recognition and Machine Learning
Nature of Course	Program Elective-V
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1.Study the parametric and linear models for classification 2.Design neural network and SVM for classification 3.Develop machine independent and unsupervised learning techniques.

Department	ECE
Course Code	MCE 301C
Title of Course	Remote Sensing
Nature of Course	Program Elective-V
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1.Understand basic concepts, principles and applications of remote sensing, particularly the geometric and radiometric principles; 2.Provide examples of applications of principles to a variety of topics in remote sensing, particularly related to data collection, radiation, resolution, and sampling.

Department	ECE
Course Code	MCE 302A
Title of Course	Business Analytics
Nature of Course	Open Elective
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1. Students will demonstrate knowledge of data analytics. 2. Students will demonstrate the ability of think critically in making decisions based on data and deep analytics. 3. Students will demonstrate the ability to use technical skills in predicative and prescriptive modeling to support business decision-making. 4. Students will demonstrate the ability to translate data into clear, actionable insights.

Department	ECE
Course Code	MCE 302B
Title of Course	Operations Research
Nature of Course	Open Elective
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1. Students should able to apply the dynamic programming to solve problems of discreet andcontinuous variables. 2. Students should able to apply the concept of non-linear programming. 3. Students should able to carry out sensitivity analysis. 4. Student should able to model the real-world problem and simulate it.

Department	ECE
Course Code	MCE 302C
Title of Course	Cost Management of Engineering Projects
Nature of Course	Open Elective
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1. Students will demonstrate knowledge of data analytics. 2. Students will demonstrate the ability of think critically in making decisions based on data and deep analytics. 3. Students will demonstrate the ability to use technical skills in predicative and prescriptive modeling to support business decision-making. 4. Students will demonstrate the ability to translate data into clear, actionable insights

Department	ECE
Course Code	MCE 302D
Title of Course	Industrial Safety
Nature of Course	Open Elective
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	1.Understand basic concepts, principles and applications of remote sensing, particularly the geometric and radiometric principles; 2.Provide examples of applications of principles to a variety of topics in remote sensing, particularly related to data collection, radiation, resolution, and sampling.

Department	ECE
Course Code	MCE 302E
Title of Course	Composite Materials
Nature of Course	Open Elective
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	

Department	ECE
Course Code	MCE 302F
Title of Course	Waste to Energy
Nature of Course	Open Elective
Type of Course	Lectures
Contact Hours	3L+0T
Total Contact Hours	34
Course Outcomes	

Department	ECE
Course Code	MCE 381
Title of Course	Dissertation –I
Nature of Course	Compulsory
Type of Course	Major Project
Contact Hours	0L+0T+20P
Total Contact Hours	30
Course Outcomes	1.Ability to synthesize knowledge and skills previously gained and applied to an in-depth study and execution of new technical problem. 2.Capable to select from different methodologies, methods and forms of analysis to produce a suitable research design, and justify their design.

Department	ECE
Course Code	MCE 481
Title of Course	Dissertation –II
Nature of Course	Compulsory
Type of Course	Major Project
Contact Hours	0L+0T+32P
Total Contact Hours	30
Course Outcomes	1.Ability to synthesize knowledge and skills previously gained and applied to an in-depthstudy and execution of new technical problem. 2.Capable to select from different methodologies, methods and forms of analysis toproduce asuitable research design, and justify their design. 3.Ability to present the findings of their technical solution in a written report. 4.Presenting the work in International/ National conference or reputed journals.