Mewar University, Gangrar

Department of Electronics and Communication

A. Programme Outcomes (POs) for B.Tech.(ECE):

Engineering Graduates will be able to:

PO1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineeringfundamentals, and an engineering specialization to the solution of complex engineeringproblems.

PO2. **Problem analysis**: Identify, formulate, review research literature, and analyze complexengineering 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. **Modern 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 society**: 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. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **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.

PO11. **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.

PO12. 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.

B. Course Outcomes (COs) for B.Tech.(ECE):

Sr. No.	Course Code	Course Title	Course Outcomes
First Semester			
1	BS-101	Engineering Physics-I	The objective of teaching engineering physics is to give an understanding of the basic knowledge and impart quality education in physical sciences to the budding engineers. To strengthen the skills in basic measurements by exposing the students to well equipped labs and enhance the problem solving ability through interactive classes.
2	BS-103	Engineering Mathematics-I	An effective knowledge of mathematics for all engineering students is a necessary requirement for the education of qualified engineering graduates capable both of innovation and of adaptation to changing technology. After completing the syllabus, Students can better understand the mathematical terms used to solve the engineering problems under different conditions.
3	BS-105	Engineering Chemistry	It is essential that one has to understand the fundamentals of basic sciences before trying to learn their application in various branches. In framing the curriculum of chemistry, emphasis has been laid on the teaching of such topics, which have abearing on the topics of various branches of engineering. With this object in view, some important fundamental topics of chemistry have been Included in this syllabus.
4	ES-101	Engineering Graphics & Drawing	The objective of this course is to accurately and unambiguously capture all the geometric features of a product or a component and convey all the required information that will allow a manufacturer to produce that component.

5	ES-103	Fundamentals of Computers and Programming	To know the components of a Computer System, To understand basic Concepts of Operating System and Computer Networks, To have an overview of different types of operating systems like DOS, UNIX/LINUX Operating System, Windows XP, To have a thorough knowledge of various System Software and Programming languages, To study different kinds of Number system, To know the concepts of Problem Solving, To have a thorough knowledge of C language and its programming.
6	ES-105	Basics of Electrical Engineering	Students will be able to learn the fundamentals of Electrical Engineering in Circuit Analysis, Measurements & electrical machines. This will help students of all disciplines to understand the basics of Electrical Engineering.
7	ELGA-101	English Language and General Awareness-I	The course is specifically focused on laying a firm foundation for English language proficiency by helping students build a strong base in Grammar and vocabulary.
Second Semester			
8	BS-102	Engineering Physics-II	The objective of this course is to give an understanding of the basic knowledge and impart quality education in physical sciences to the budding engineers. To strengthen the skills in basic measurements by exposing the students to well equipped labs and enhance the problem solving ability through interactive classes.
9	BS-104	Engineering Mathematics-II	The aim of the course is to solve the applications based on real industrial problems. Uncertainty is an essential feature of the engineering environment and for this reason the fields of probability and statistics are also included.
10	ES-102	Introduction to Environmental Sciences	This course will help students to develop an understanding of various environmental issues, Need for sustainable development, Solid waste disposal, Degradation of environment, Global warming, The depletion of ozone layer, Loss of biodiversity and various environmental laws.
11	ES-104	Introduction to CADD	The objective of this course is to introduce the students about how

			computer help in industrial designing, Basics of computer graphics, knowledge about AutoCAD software.
12	ES-106	Basics of Electronics Engineering	This course enables the students to understand the concept and behavior of passive electrical components in DC and AC circuits, Structure, Functionality and characteristics of electronic devices and their usage in designing analog and digital circuits. It also describes some advanced applications and how electronic circuits can interact with outside world.
13	ES-108	Basics of Mechanical Engineering	The main objective of the course is to understand and identify the problems related to mechanical engineering, Which may come across to the students, Irrespective of any branch of engineering during their career. In present industrial scenario engineers of every field are employed, Therefore the students of every branch must know the basic concepts of mechanical engineering.
14	ELGA-102	English Language and General Awareness-II	The course aims at helping the students enhance their quality of English communication by developing an understanding of correct usage of words and phrases. It also helps them frame grammatically as well as logically correct sentences.
Third Semester			
15	ECE-201	Semiconductor Devices and Circuits	This course enables the students to understand semiconductor devices. Student will learn semiconductor material physics, And semiconductor device physics, The working of PN junction diodes and special purpose diodes, The basic working physics of BJT and FET both in ideal and non-ideal conditions, Characteristics, Applications of these devices.
16	ECE-203	Circuit Theory	At the end of this course, Students will be able to Analyze a circuit given dc and sinusoidal inputs, Use several alternative techniques in time-domain and frequency-domain to analyze the same, Use of techniques to simplify the analysis of complex circuits, Compute average power consumed or supplied by a circuit, Measure and compute basic circuit parameters from measurements

17	ECE-205	Signals, Systems	The purpose of this course is to introduce students to the fundamentals of signals and systems which are basic to Digital Signal Processing. The main objective of this subject is to help the students to mathematically analyze different types of signals and their associated systems. Students will learn various classifications of both Continuous time and Discrete time Signals and Systems, Spectral analysis of Periodic and Aperiodic Signals using Fourier series, Analysis and characterization of the CT system through Laplace transform, Analysis and characterization of the DT system through Z transform.
18	ECE-207	Data Structures and Algorithms	The purpose of this course is to impart knowledge on various data structure concepts and algorithm principles. Student will be able to learn Several data structure concepts like stacks, Queues, Linked list, Trees and graphs, Various sorting methods, Algorithm principles like Dynamic programming, Divide & conquer and Back tracking.
19	ECE-209	Networks and Transmission Lines	To lay a strong foundation on the theory of transmission line and networks by highlighting their applications. To become familiar with propagation of signals through lines. Calculation of various line parameters by conventional and graphical methods. Need for impedance matching and different impedance matching techniques Design of different types of filters, Equalizer and attenuators.
20	HS-201	Essentials of Management and Organizational Behavior	To help the students lay a foundation to an understanding of Management and Organizational behavior which are essential fields of study to make a success of both their professional and personal lives.
21	ELGA-201	English Language and General Awareness-III	The course is designed to help students develop effective communication skills, and hence, it lays emphasis on their spoken and listening skills.
Fourth Semester			
22	ECE-202	Principles of Communication	To study the basics of analog communication systems. Students will learn Various Amplitude modulation and demodulation systems, Various Angle

			modulation and demodulation systems, Basics of Noise theory and performance of various receivers. Course enables the students to learn processes, Circuits and other building blocks of communication systems.
23	ECE-204	Digital Circuits	The course enables the students to understand, Number systems, Simplification of Boolean functions, Building blocks of combinational and sequential circuits and programmable logic devices. It enables them to analyse and design the combinational and sequential circuits, Controllers and real applications.
24	ECE-206	Computer Architecture and Organization	This course enables students to understand fundamentals of computer hardware modules, Their interconnection and design of algorithms. Students will learn to write micro-operations, Design instructions, Control units, IO interfaces for memories and other devices, Techniques for performance enhancement.
25	ECE-208	Analog Electronics	The purpose of this course is to introduce to the students the basics of biasing transistor circuits, Feedback amplifiers, Large signal amplifiers, Tuned amplifiers, Oscillators, Wave shaping circuit using transistor &analyzing different electronic circuits. Students will learn Operating point calculations and working of basic amplifiers, Working of different types of feedback amplifiers & oscillators, Frequency response and design of tuned amplifiers, Basic working & design of wave shaping circuits.
26	ECE-210	Electronic Measurements and Instrumentation	The purpose of this course is to introduce students to the various types of measurements made in electronics and the instruments used for measuring them. The main objective of this subject is to help students identify the different latest measurement techniques available for specific engineering applications. Students will learn various measurement techniques available, Working of instruments used for measurement, errors in measurements and their rectification.

27	HS-202	Fundamentals of Business & Economics	To provide the students a basic understanding of Business and Economics which are vital constituents of the overall professional environment of an engineer.
28	ELGA-202	English Language and General Awareness-IV	The course deals with clause analysis, sentence classification based on clauses, time and tense and common errors in sentence structure. The purpose is to familiarize students with all kinds of sentences and their use.
Fifth Semester			
29	ECE-301	Control Systems	This course enables the students to learn basics of feedback, Transfer function, Performance parameters of control systems. Students will learn to analyze stability issues of linear systems in time domain and frequency domain and using graphical techniques.
30	ECE-303	Digital Signal Processing	The purpose of this course is to introduce the concepts of Digital signal processing and DSP Processor. The mathematical analysis of FIR and IIR filter design and simulation using MATLAB are dealt with in detail. The students will be able to understand the structures of Discrete time signals and systems, Frequency response and design of FIR and IIR filters, Finite word length effect, multirate digital signal processing.
31	ECE-305	Electromagnetic Theory	To enable the students, To have a fair knowledge about the theory and problems of electromagnetism and waveguides. Students will understand the basic concepts of electric field and magnetic field, Compare between field and circuit theory, Need for impedance matching and different impedance matching techniques, Different types of waveguides.
32	ECE-307	Microprocessors	This course enables students to understand fundamentals and functionality of microprocessors, Assembly language programming, Delay calculations, Memory and IO interfacing methods and study of various peripheral chips, Data converters that will help to design real time control and monitor applications.
33	ECE-309	Waveguides, Antennas and Wave Propagation	The purpose of this course is to enable the students to the basics of antennas and various types of antenna arrays and its

			radiation patterns. The main objective of this subject is to help students to identify the different latest antennas available for specific communication. Students will understand various techniques involved in various antenna parameter measurements and propagation of radio waves in the atmosphere.
34	ECE-311	Linear IC Applications	To enable the students to understand the fundamentals of integrated circuits and designing electronic circuits using it. Students will be able to design simple circuits like amplifiers using op-amps, To design waveform generating circuits, To design simple filter circuits for particular application, to gain knowledge in designing a stable voltage regulators, Waveform generators.
35	ELGA-301	English Language and General Awareness-V	The course facilitates the learning of the principles of effective formal and business communication.The course is designed to familiarize students with the developments in the fields of science, defence, space, sports and cinema. The course will also help students in develop general mental ability
Sixth Semester			
36	ECE-302	Information Theory and Coding	The instructional objective of this subject is to introduce to the students the concept of source coding, The various coding techniques that are used for practical purposes. Fundamental concepts of coding theorem and the various types of error control codes and decoding techniques are also introduced. Students will be able to understand and apply Several Source Coding Techniques, Channel Coding Theorem & Various codes,Block Codes, Error Control Coding.
37	ECE-304	Introduction To MEMS	Purpose of this course is to gain basic knowledge on MEMS (Micro electro Mechanical System) and various fabrication techniques. This enables them to design, Analyze, Fabricate and test the MEMS based components. Students will learn Introduction to MEMS and micro fabrication, essential material properties, various sensing and transduction technique, various fabrication and machining process of MEMS, About the

			polymer and optical MEMS.
38	ECE-306	Digital Communication	To provide a comprehensive coverage of digital communication systems. The key feature of digital communication systems is that it deals with discrete messages and the purposes are to add organization and structure to this field. Students will understand Pulse modulation and the process of sampling, Quantization and coding that are fundamental to the digital transmission of analog signals, Base band pulse transmission which deals with the transmission of pulse amplitude modulated signals in their base band form, Pass band data transmission methods.
39	ECE-308	Microwave Engineering	To introduce the students, To the basics of microwave devices, Microwave measurements and modeling of RF circuits used in communication systems. Students will understand about Microwave devices such as Amplifiers, Oscillators, Microwave measurements , RF basic concepts, RF filter design, RF amplifier design.
40	ECE-310	Digital Design using VHDL	This course will enable students to learn programming skills of VHDL, Functions and procedures, Concepts of input/ output files. They will be able to design digital circuits using VHDL, Simulate and implement the designs on FPGAs using EDA tools.
41	ECE-312	Computer and Communication Networks	It enables students to know use of computers in communication as well as in network formation. The course focuses on mode of data transfer, Layer and protocols related to networks. Students will understand about the functions and services of all 7 layers of OSI model, Get an idea of various network standards.
42	ECE-320	Seminar	The student is required to deliver an independent seminar on any of emerging areas/ application of Electronics & Communication Engineering courses. Senior faculty will supervise the students in selecting and preparation of the same. The student will submit two copies of seminar report (at least one week prior to the presentation) and shall make oral presentation as per time schedule decided by the faculty concerned. Internal

			Evaluation will be made on the basis of report, Presentation and the discussion during the presentation.
43	ELGA-302	English Language and General Awareness-VI	The purpose of the course is to make the students confident of using English in formal as well as informal communication for business and all other purposes. The purpose of the course is to provide information on the basic concepts of entrepreneurship, IT, and business infrastructure and related legal concepts. Besides, this course also aims at familiarizing student with energy technologies and functioning of human body.
		Seventh Semester	
44	ECE-421	Departmental Elective-I **VLSI Design**	Purpose of this course is to introduce the technology, Design concepts, Electrical properties and modeling of Very Large Scale Integrated circuits. Students will learn the design of basic MOS Circuits, Concepts of modeling a digital system using Hardware Description Language and design implementation on FPGAs.
45	ECE-422	Departmental Elective-II **Optoelectronic Devices**	Purpose of the course is to introduce the students to various optical fiber modes, Configurations and various signal degradation factors associated with optical fiber and to study about various optical sources and optical detectors and their use in the optical communication system. Students will learn optical source materials, LED structures, Quantum efficiency, Laser diodes, Optical receivers such as PIN APD diodes, Noise performance in photo detector, Receiver operation and configuration.
46	ECE-423	Departmental Elective-III **Satellite Communication Systems**	The main objective of this course is to make the students understand the basic concept in the field of satellite communication. This subject gives the students an opportunity to know how to place a satellite in an orbit. The students are taught about the earth and space subsystems. The satellite services like broadcasting are dealt thoroughly. Students will also learn Orbital aspects involved in satellite communication, Power budget calculation, Satellite system and services provided.

47	ECE-424	Departmental Elective-IV **Digital Signal Processor and Applications**	This course introduces Digital Signal processors. At the end of this course the student will be knowing various DSPs their architectures and uses.
48	OE-431	Open Elective-I **Artificial Intelligence**	To make the students understand the basic concepts of AI. After undergoing this course the students will have the knowledge of issues in AI, Programming, Knowledge representation, Approximate reasoning, Planning and learning etc.
49	OE-432	Open Elective-II **Entrepreneurship**	After the completion of the course, the students will be able to have the ability to discern distinct entrepreneurial traits, Know the parameters to assess opportunities and constraints for new business ideas, Understand the systematic process to select and screen a business idea, design strategies for successful implementation of ideas, write a business plan.
Eighth Semester			
51	ECE-441/442	Industrial Training/Project	Each student is expected to undergo one complete semester of industrial/ field/ Lab training in order to connect the class room teaching with real time practical applications. A supervisor (faculty from the Department) shall be assigned to the student approved by the competent authority. The training and placement officer (TPO) will facilitate the students for the purpose with the consent of his/her supervisor and also considering the interests of the student. During training the student will undertake a project involving design/ experimental/ analytical/ computational work including case studies etc. The progress of the project work will be evaluated by the concerned supervisor and TPO by visiting the site/ industry/ lab etc.

C. Programme Outcomes (POs) for M.Tech Digital Communication:

1. Acquire in-depth knowledge of communication systems and engineering , including wider and global perspective, with an ability to discriminate, evaluate, analyse and synthesise existing and new knowledge, and integration of the same for enhancement of knowledge.

2. Analyse complex engineering problems of circuits & communication systems critically, apply independent judgement for synthesising information to make intellectual and/or creative advances for conducting research in a wider theoretical, practical and policy context.

3. Think laterally and originally, conceptualise and solve engineering problems, evaluate a wide range of potential solutions for those problems and arrive at feasible, optimal solutions after considering public health and safety, cultural, societal and environmental factors in the circuits & communication systems

4. Extract information pertinent to unfamiliar problems through literature survey and experiments, apply appropriate research methodologies, techniques and tools, design, conduct experiments, analyse and interpret data, demonstrate higher order skill and view things in a broader perspective, contribute individually/in group(s) to the development of scientific/technological knowledge in one or more domains of communication engineering.

5. Create, select, learn and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities with an understanding of the limitations of communication engineering.

6. Possess knowledge and understanding of group dynamics, recognise opportunities and contribute positively to collaborative-multidisciplinary scientific research, demonstrate a capacity for self-management and teamwork, decision-making based on open-mindedness, objectivity and rational analysis in order to achieve common goals and further the learning of themselves as well as others.

7. Demonstrate knowledge and understanding of engineering and management principles and apply the same to one's own work, as a member and leader in a team, manage projects efficiently in communication engineering and multidisciplinary environments after consideration of economical and financial factors.

8. Communicate with the engineering community, and with society at large, regarding complex engineering activities confidently and effectively, such as, being able to comprehend

and write effective reports and design documentation by adhering to appropriate standards, make effective presentations, and give and receive clear instructions.

9. Recognise the need for, and have the preparation and ability to engage in life-long learning independently, with a high level of enthusiasm and commitment to improve knowledge and competence continuously.

10. Acquire professional and intellectual integrity, professional code of conduct, ethics of research and scholarship, consideration of the impact of research outcomes on professional practices and an understanding of responsibility to contribute to the community for sustainable development of society.

11. Observe and examine critically the outcomes of one's actions and make corrective measures subsequently, and learn from mistakes without depending on external feedback.

D. Course Outcomes (COs) for M.Tech Digital Communication:

Sr. No.	Course Code	Course Title	Course Outcomes
First Semester			
1	DC – 611	Advanced Digital Communications	The subject covers the most important aspects of M.Tech program in digital communication. It provides basis of communication technology that has revolutionized the communication media and has seen very fast development and applications in communication technology. The subject contain, block diagram and circuits form the basis of the subject which is further fruitful for application in society. It forms the basic of mathematical modelling and deep knowledge of communication engineering for the purpose of further research and development and other applications. Modern applicants emphasize mainly on digitization and so digital communication is the key subject of programme and is the backbone of the M.tech programme. It emphasizes the technology of digital communication and provides the platform to use the concept of digital communication for further higher studies like Ph.d and R&D. It application has

			benefitted the society a lots communication has grown very fast and has connected the world. Distance now has become nowhere for near and dear ones as they can communicate very reliably and fast and less cost which is wonderful application of subject for the society it study and acquiring knowledge on the subject certainly leads to more option of application and enhancement in technology.
2	DC – 613	Satellite Communication	To acquire in-depth knowledge of satellite communication and system including wider and global perspectives by learning the orbital aspects of satellite communication and mechanism of launching the satellite, the spacecraft system with an ability to discriminate, evaluate, analyse and synthesise existing and new knowledge, and integration of the same for enhancement of knowledge. To be able to design the satellite links for specified performance by analysing complex engineering problem in satellite communication critically and by thinking latterly and originally to conceptualise and solve problems in satellite link design, evaluate the wide range of potential solutions for those problems and arrive at feasible, optimal solutions after considering public health, societal and environmental factors.
3	DC – 615	Mobile Communication	Mobile communication is mainly used for transmitting voice, video and data in local or wide areas. It Provides information about voice and data communication services to mobile users who use cell phones, PDAs, internet terminal, and related computing devices. The number of wireless mobile devices is increasing globally. Users equipped with portable computers, PDAs(personal digital assistance), and variety of small wireless communication devices increasingly need to connect to corporate network, perform data base queries, exchange message, transfer file, and even participate in collaborative computing. Mobile communication systems are achieving higher data rates to support internet and

			other data related applications.
4	DC – 711	Network Protocol Design	This subject introduces different Network Protocols Syntax and semantics of Traditional protocol specifications, Protocols stacks, SONET/SDH Signaling system, ATM Switches.it also introduces different network processes: Constants, inputs and variables, actions, protocol execution, Messages with fields, Nondeterministic assignment, Process arrays, parameters, Resource allocation protocol.it gives knowledge about different transmission errors, maintaining local, global, hierarchical topology information, Security: Encryption, classical encryption techniques, advance encryption techniques Data Compression: Huffman coding, static Huffman compression, dynamic Huffman compression, context sensitive compression, lossy compression Applications, Protocol layers and hierarchies.
5	DC – 721	RF and Microwave Circuit Design	This is a course on the design and applications of microwave devices and amplifiers and RF filter circuits. This course introduces basic principles of microwave amplifiers such as klystron, reflex klystron and magnetron applications. Much attention is given to basic microwave amplifiers, oscillators and measurement of power, VSWR and impedance .Introduction of basic RF concepts and design of basic filters. It also deals with RF basic oscillators, mixers.
Second Semester			
6	DC – 612	Information Theory and Coding	The course introduces the principles and applications of information theory. The students can learn how information be measured in term of probability and various entropies, and how these are used to calculate the capacities the communication channel, continuous/discreet with or without noise. Coding Scheme including error correcting codes along with data compression, spectral analysis, and efficient coding using wavelets will be helpful for

			students. Applications of information theory will also be aware the students about the applicability of the courses
7	DC – 614	Digital Signal Processing and its Applications	To acquire in depth knowledge of modelling to filter, linear estimation, linear prediction, spectrum estimation and adaptive filter with an ability to integrate the same for enhancement of knowledge. To analyse complex engineering problem of circuits and communication system critically to make intellectual and/or creative advances for conducting research in wide theoretical, practical and policy context, to contribute to collaborative multidisciplinary scientific research. To create, select, learn and apply appropriate techniques, resources and modern engineering tools including, prediction and modelling to complex engineering activities with an understanding of the limitation of communication engineering.
8	DC – 616	Data Communication and Computer Networks	This course is to provide students with an overview of the concepts and fundamentals of data communication and computer networks. Topics to be covered include: data communication concepts and techniques in a layered network architecture, communications switching and routing, types of communication, network congestion, network topologies, network configuration and management, network model components, layered network models (OSI reference model, TCP/IP networking architecture) and their protocols, various types of networks (LAN, MAN, WAN and Wireless networks) and their protocols.
9	DC – 712	Digital Image Processing	To acquire in depth knowledge of image model and transform, image enhancement image restoration, image encoding and image segmentation. To analyse complex engineering problems, critically apply independent judgement for synthesising information to make intellectual and/or creative advances for conducting research in a wider theoretical, practical and policy content. To extract information pertinent to unfamiliar problems through literature survey and experiments apply appropriate research methodologies techniques and

			tools, design, conduct experiments , analyse and interpret data, demonstrate higher order skill and view thing in a broader perspective, contribute individually/in group(s) to the development of scientific/technological knowledge in one or more domain of engineering after considering public health and safety, cultural, societal and environmental factors.
10	DC – 722	Microwave Communication	To acquire in depth knowledge of microwave communication including interference frequency planning, digital microwave radio equipments, line of sight radio link engineering. To analyse complex engineering problem of communication system critically to extract information pertinent to unfamiliar problem through experiment, apply appropriate research methodologies, techniques and tools, design, conduct experiment, analyze and interpret data.
Third Semester			
11	DC – 621	Optical Communication	The most reliable and the most efficient method of communication is optical fibre communication. So study of this subject is most important as a part of M.Tech program in digital communication. Application of optical communication is in military, defence and other crucial fields where one cannot make compromise with quality. It is very fast communication media and is most preferred for internet and other field where speed and reliability matters. Optical communication as separate spectrum as compare to conventional method so is a solution of spectrum crises as well. It has EMI so is a very useful for communication technology. The maintenance of equipmentsare very low life of operation is very long and is not very costly. All these feature make it very important communication media. So, naturally the more R&D work need to done for further more application of the field which need to have deep knowledge of subject and hence is most necessary

			subject of M.Tech program which forms the basis to work on the communication technology which is most efficient and most preferred. This will lead to more application of the technology useful for mankind. Again it gives deep knowledge of the subject contents, technology, mathematical modelling which can be used for further higher studies lie PhD or R&D for further enhanced application of technologies
12	DC – 623	Antenna and Wave Propagation	To acquire in depth knowledge of radiation from cylindrical antennas, /antenna arrays, Antenna synthesis and measurements, propagation. To analyse complex engineering problem of communication system critically to extract information pertinent to unfamiliar problem through experiment, apply appropriate research methodologies, techniques and tools, design, conduct experiment, analyze and interpret data.
13		Research Methodology	The course will be able to define research and describe the researchprocess and research method. Students will be able to select and defineappropriate research problem and parameters. Students will be able tounderstand the processes and requirement for conducting successfulresearch. Students will know how to apply the asic aspects of theresearch process in order to plan and execute a research project and effectively use the library and its resources in gathering information related to the learners research project. Students can understand qualitative research and methods use to execute and validate qualitative research. They will be able to present, review and publish scientific article. Students will be able to prepare research report and thesis and present a conference paper/poster at a national/international conferences.
Fourth Semester			
14	DC – 628	Dissertation	The primary objective of this course is to enhance the student ability to analyze and carry out independent investigations etc. Each student will carry out independent

			work which should involve creativity, innovation and ingenuity.

Program Specific Outcomes (PSOs)

At the end of the program, the student:

PSO1. Should be able to clearly understand the concepts and applications in the field of Communication/networking, signal processing, embedded systems and semiconductor technology.

PSO2. Should be able to associate the learning from the courses related to Microelectronics, Signal processing, Microcomputers, Embedded and Communication Systems to arrive at solutions to real world problems.

PSO3. Should have the capability to comprehend the technological advancements in the usage of modern design tools to analyze and design subsystems/processes for a variety of applications.

PSO4. Should posses the skills to communicate in both oral and written forms, the work already done and the future plans with necessary road maps, demonstrating the practice of professional ethics and the concerns for societal and environmental wellbeing.