M.Tech ECE Course Objectives

Semester-1	
Course Code	**Course Outcomes**
MA 2109 (Probability, Statistics and Random Process)	**CO1**- get in-depth knowledge about the mathematical tools discussed in this subject. **CO2-** able to apply the mathematical tools to areas such as random noise and sampling based on observed data for use in electronics and communication systems
EC 2101 (Information Theory and Coding)	**CO1-** The course is intended to give students a basic idea of information theory and coding. **CO2-** The course offers different types of source and channel coding technique, channel capacity and bounds, probability of error calculation for different channels.
EC 2102 (4G Technologies and Beyond)	**CO1-** This course offers basic understanding of 4G mobile communication. **CO2-** Students will be acquiring knowledge in 4G and 4G+ mobile communication and beyond. **CO3-** This course describes fundamentals of wireless propagation channel, Cellular Concept and overview of different Cellular system.
EC 2103 (Applied Electromagnetics)	**CO1-** Over viewing of fundamentals of electromagnetic waves. **CO2-** To serve as an advanced course in acquiring knowledge of electromagnetic Theory along with its applications in various fields.
EC 2131 [VLSI and Embedded system (Elective-I)]	**CO1-** To serve as a basic course in acquiring knowledge in Very Large Scale Integration (VLSI). **CO2-** This course describes impart a solid understanding of the role of embedded systems and embedded systems design. **CO3-** Students will be able to get the knowledge about the development of NMOS, PMOS and CMOS based circuitry, fabrication techniques, VHDL programming language.
EC 2132 [Soft Computing Techniques (Elective-I)	**CO1-** Students will be able to understand the soft computing techniques such as Genetic Algorithms (GA), Fuzzy Logic and Neural Network. **CO2-** Students will be able to understand the various optimization Techniques. **CO3-** Students will be able to take up projects at advanced/professional level.
EC 2133 [Digital and Spread Spectrum Communication (Elective-I)]	**CO1-** To serve as a basic course in acquiring knowledge in Digital & Spread Spectrum Communication. **CO2-** Students will be gathering knowledge about the fundamentals of signals; Channel coding, Modulation and Spectrum Shaping, Radio Channel Characteristics, Spread Spectrum Communication, Multiuser communication **CO3-** Application areas are in 3G mobile system, Satellite communication system, GPS technology, Digital RADAR and others. Students will be able to get the employment in these technology domains.
EC 2161 (VLSI Laboratory)	**CO1-** To familiarize the students with the basics of VLSI Design and VHDL Programming Language. **CO2-** Students will be able to design the VLSI circuitry, layout design and floor planning using Mentor-graphics software. **CO3-** Students will be able to design the digital electronics circuitry, and to write VHDL code and to implement system/subsystem using FPGA Board.

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EC 2162 (Communication Laboratory -I)	**CO1-** The principal objective of this lab is to provide the students a hands-on exposure to the 3G and 4G systems. **CO2-** In this subject, students will be exposed with different technologies like CDMA, LTE, LTE-A with MIMO and 5G
EC 2181 (Seminar – I)	**CO1-** Students are advised to present the latest trends of technological activities in the field of Digital Electronics And Communication Engineering (DECE) or the other relevant fields.
Semester-2	
EC 2201 (Satellite and Optical Communication Systems)	**CO1-** The major items to be covered in this subject is the addressing of enhanced data rate and network coverage globally using Satellite communication. **CO2-** The optical communication offers up to 100Gbps data rate while the satellite communication is the only competitor of optical communication in wireless domain. **CO3-** Students will be knowledgeable out of this subject from basics to the advanced applications of satellite as well as optical communication.
EC 2202 (Advanced Signal and Image Processing)	**CO1-** The course is intended to give students a clear idea of signal processing methodologies in modern digital devices. **CO2-** The course is divided into two units. The signal processing course offers a brief introduction to multi-rate signal processing and adaptive filters. The objective of unit II is to enrich the knowledge of the students with a sound understanding of various techniques of digital image processing as one of the thrust areas of signal processing. **CO3-** This course will present the fundamentals of image processing and special attention is given towards image compression (like JPEG, MPEG).
EC 2203 (Communication Networks)	**CO1-** Identify the different approaches towards computer networking **CO2-** Compare and contrast the underlying technologies and **CO3-** Problem solving based on case studies
EC 2204 (Cognitive Radio in 5G)	**CO1-** To serve as a beginner course in acquiring knowledge in Cognitive Radio to be utilized in 5th Generation Mobile Communication system. **CO2-** The Unit I of the course describes Fundamental Issues in Cognitive Radio, Radio-Scene Analysis, Stochastic Approach for Spectral Estimation, Extraction of Channel-State Information, Information Theoretic Analysis of Cognitive Radio Systems, Coexistence and Spectrum Sharing, Basic Cognition Cycle, Protocol Suite for Cognitive Radios in Dynamic Spectrum Access Networks, OFDM/FBMC based Cognitive Radios for Dynamic Spectrum Access Networks, Opportunistic Spectrum Access Strategy. **CO3-** The Unit II of the course describes the application of Cognitive radio in 5G Mobile System. **CO4-** The Cumulative Knowledge of UNIT I and UNIT II is thus aiming for further progress in research as well as ample Job opportunities in the field of Electronics and Communication Engineering.
EC 2231 [High Speed Digital Design (Elective-II)]	**CO1-** To update the systems towards fully digital systems. **CO2-** To enable the designer towards digital era. **CO3-** After completion, students will be in a position for designing and analyzing the high speed digital system.

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EC 2232 [Internet of Things (Elective-II)]	**CO1-** The course is designed to provide an introduction to the Internet of Things (IoT) for postgraduate students who already have a background in electronic engineering or a related subject, an understanding of basic networking, wireless communication. **CO2-** Students will be able to understand the basics of Internet of Things. **CO3-** Students will be able to get an idea of some of the application areas where Internet of Things can be applied. **CO4-** Students will be able to understand the middleware for Internet of Things. **CO5-** Students will be able to understand the IOT protocols. **CO6-** On completion of this course, understand where the IoT concept fits within the broader ICT industry and possible future trends. Understand the various network protocols used in IoT. Be familiar with the key wireless technologies used in IoT systems, such as WiFi, 6LoWPAN, Bluetooth and ZigBee. After completion, students will be in a position for designing and analyzing the IOT systems which has high market demand.
EC 2233 [Information Communication Technology (Elective-II)]	**CO1-** Students will be able to know about the ICT enabled services which are becoming the major thrust areas in electronics sectors. **CO2-** The retrieval of information and communicating it reliably to distance places are the major issues. But this syllabus for ICT differs from other ICT enabled services where the sensing through radar provides the information about the remote objects. **CO3-** After completion, students will be in a position for designing and analyzing the concurrent sensing and communication systems which has high market demand.
EC 2261 (Advanced DSP Laboratory)	**CO1-** The principal objective of this lab is to provide the students a hands-on exposure to the MATLAB and DSP Processors. **CO2-** Students will be able to implement various signal processing task using MATLAB and real time DSP processors.
EC 2262 (Communication Laboratory – II)	**CO1-** Students will be able to simulate and design an OFDM based communication system and validating it using FPGA. **CO2-** Students will be able to design and simulate Pulse Doppler radar. **CO3-** Students will learn how to design a phased array based digital beamforming system for advanced wireless communication and Digital Array RADAR and other systems.
EC 2281 (Seminar-II)	**CO1-** Students are advised to present the latest trends of technological activities in the field of Digital Electronics And Communication Engineering (DECE) or the other relevant fields.
Semester- 3 & 4	
EC 2375 (Dissertation)	**CO1-** To prepare students for real life design project leading to quality publications. **CO2-** To explore and enhance research potential. **CO3-** To learn the latest trends and technology in selected field of interest.