

## 2.6 Student Performance and Learning Outcome

### 2.6.1 Course Outcomes (COs)

#### Summary

Course outcomes are specific statements that outline what students are expected to learn and achieve by the end of a course. They provide a clear framework for assessing students' progress and ensuring that the course objectives align with educational standards. Outcomes typically encompass knowledge acquisition, skill development, and the application of learning in practical scenarios. Effective course outcomes are measurable, attainable, and relevant, guiding both teaching strategies and assessment methods. They help in setting clear expectations and ensuring that students are equipped with the necessary competencies for their academic and professional growth.



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Institute of Technology &  
Management, Gwalior



Dr. Meenakshi Mazumdar  
**DIRECTOR**  
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## Department of EC and Electrical Engineering

### Table of Content

S.no.	Title	Page No.
1	Academic Year 2020-21, 2021-22, 2022-23, 2023-24	1-12
2	Academic Year 2019-20	13-24

## Department of EC and Electrical Engineering


Academic Year 2020-21, 2021-22, 2022-23, 2023-24

B.Tech ECE 3 <sup>rd</sup> Sem		
Course Code/Course Name	Course Outcomes	
BT 301 (Mathematics-III)	BT301.1	Ability to Understand and evaluate the zero of algebraic and transcendental equations, simultaneous linear equations with the help of Numerical Methods
	BT301.2	Understand the theoretical principles of numerical techniques and the associated error measures and apply them to find differentiation and integration when numerical values are given.
	BT301.3	Ability to remember operators and use them to estimate the value between the given set of data (interpolation) and hence, apply it to estimate various real life scenarios.
	BT301.4	Analyze different types of statistical situations in which different probability distributions can be applied.
	BT301.5	Ability to analyze and evaluate the solution of ODE and PDE by using Laplace and Fourier Transform
EC 302 (Electronic Measurement & Instrumentation)	EC302.1	To understand and analyze the performance characteristics of instruments
	EC302.2	To demonstrate functions of oscilloscope and different types of oscilloscopes
	EC302.3	To apply the complete knowledge of various transducers to measure the physical quantities in the field of science, engineering and technology.
	EC302.4	Analyze various signal generators and differentiate display systems w.r.t digital devices
	EC302.5	Explain the construction and working of various ADC & DAC
EC 303 (Digital System Design)	EC303.1	Students will be able to understand and apply the basic concept of digital electronics for digital circuit and system design.
	EC303.2	Students will be able to realize and describe the operation of combinational circuits.
	EC303.3	Students will be able to realize and describe the operation of a finite state machine.
	EC303.4	Students will be able to realize and describe the operation of sequential circuits.
	EC303.5	Students will be able to apply the fundamental knowledge of analog and digital electronics principles for understanding and creating different logic families and PLD's.
EC 304 (Electronic Devices)	EC304.1	Students will be able to understand and apply the basic concept of Electronic Devices for analyzing the behavior of semiconductor devices.
	EC304.2	Students will be able to design and analyze simple rectifiers, clippers, and clamper and voltage regulators using diodes.
	EC304.3	Students will be able to design and analyze simple BJT circuits.
	EC304.4	Know about different power amplifier circuits, their design and use in electronics and communication circuits.
	EC304.5	Students will be able to design and analyze simple FET circuits.
EC 305 (Network Analysis)	EC305.1	Apply the knowledge of various laws and principles associated with electrical systems and analysis of magnetic coupling circuits and electrical resonant circuits with different techniques.

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	EC305.2	Analysis of graph theory using different techniques.
	EC305.3	Evaluate various network theorems in DC and AC Circuits by implementing experimental analysis
	EC305.4	To analyze the transient response of d.c and a.c circuits for solving problems in time domain using Laplace Transform
	EC305.5	Evaluate the given network using different two port network parameters by implementing experimental approach and analyze the relationship between parameters and Interconnection of two-port networks
EC 306 (EMI Lab)	EC306.1	To understand and analyze the performance characteristics of instrument
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BT 107 (Internship)	BT107.1	To Describe the everyday operations of an agency or organization.
	BT107.2	Student will able to Identify the ethical standards of behavior for professionals and interns within the agency/organization.
	BT107.3	Students will be able to Focus professional soft skills such as communication, punctuality and time management.
	BT107.4	Student will be able to Manage various personal habits or a social skill to deal better with work situations
	BT107.5	Build a professional network that can be a resource for the student

  
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B.Tech ECE 4 <sup>th</sup> Sem		
Course Code/Course Name	Course Outcomes	
ES 401 (Energy Environmental Engineering)	BT401.1	Identify and compare different energy resources and systems to analyze energy requirement issues
	BT401.2	Apply the concept of ecosystem and assess the synergy between the components and functions of an ecosystem
	BT401.3	Demonstrate the critical analyzing ability towards the biodiversity, its conservation and need for sustainable development
	BT401.4	To interpret and summarized the concept of environmental pollution to recognize the need of environmental protection as a lifelong learning
	BT401.5	To understand, classify and apply professional, social and environmental ethical principles
EC 402 (Signals & System)	EC402.1	Classify the continuous and discrete time signals and systems.
	EC402.2	Apply the basic operation on continuous time and discrete time signal.
	EC402.3	Students will be able to understand Discrete-time systems and LTI systems
	EC402.4	Frequency domain analysis of discrete time signal.
	EC402.5	Analysis of continuous time signal in frequency domain by Fourier Transform.
EC 403 (Analog Communication)	EC403.1	Student will be able to Analyze continuous time signal in frequency domain
	EC403.2	Students will be able to interrogating different Amplitude modulation and Demodulation technique.
	EC403.3	Analyze various Frequency Modulation and Demodulation Techniques.
	EC403.4	Students will be able to interpreting and analyzing about different transmitter, receiver and Noise
	EC403.5	Student will able to test different type of AM and FM signal, interrogate operation of transmitter (modulator) and receiver (demodulator)
EC 404 (Control System)	EC404.1	To understand & apply concept of transfer function for analysis of control systems by using Laplace transform.
	EC404.2	Evaluate performance of first & second order control systems on the basis of time response analysis.
	EC404.3	Analyze frequency domain analysis of control systems required for stability purpose.
	EC404.4	Designing the compensation & state space modal that can be used to stabilize control systems.
	EC404.5	Designing of proportional controller, integral controller, derivative controller & PID controller for automatic control systems.
EC 405 (Analog Circuits)	EC405.1	To understand the concept of feedback and feedback topologies and able to design and analyze various feedback amplifiers
	EC405.2	To understand the basic characteristics of Integrated circuits and apply them in various circuits
	EC405.3	Able to design circuits using operational amplifiers for various applications.
	EC405.4	To analyze the IC 555 Timer concept in various analog circuits.
	EC405.5	To study and apply various voltage regulators in electronic circuits.

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EC 406 (Simulation Lab)	EC406.1	Student will be able to understand use and application of lab electronic instruments like CRO, function generators in electronics circuits in Multiuse/Proteus
	EC406.2	Students will be able to identify /specify the parts, packages, pin names, libraries, footprints of the electronic components in Multiuse/Proteus
	EC406.3	Students will be able to understand the concept of part lists, net lists, making net list files in Multiuse/Proteus
	EC406.4	Students will be able to know general PCB designing terms and process: Placing Parts, Routing Traces, Modifying Traces, Mounting Holes, Adding Text, PCB Layout, DRC, Pattern Transfer etc. in Multiuse/Proteus
	EC406.5	Students will be able to understand the ASSEMBLING AND TESTING : Identifying the components and its location on the PCB, soldering of active and passive components, Testing the assembled circuit for correct functionality, Prototype designing etc. using Multiuse/Proteus.

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B.Tech ECE 5 <sup>th</sup> Sem		
Course Code/Course Name	Course Outcomes	
EC 501 (Microprocessor its Application)	EC501.1	Student will be able to understand architecture and operation of 8086 Microprocessor
	EC501.2	Students will be able to interpreting and applying programming concept of 8086 microprocessor
	EC501.3	Students will be able to understand the concept of various interfacing chips like 8155, 8255 etc.
	EC501.4	Students will be able to know General purposes programmable peripheral devices like: DMA, USART etc
	EC501.5	Students will be able to understand the architecture and operation of 8051 microcontroller
EC 502 (Digital Communication)	EC502.1	Apply the knowledge of statistical theory of communication and explain the conventional digital communication system.
	EC502.2	Evaluate the performance of PCM, DPCM and DM in a digital communication system.
	EC502.3	The ability to design pass band digital modulation systems and techniques with desired specifications.
	EC502.4	Describe and analyze the digital communication system with spread spectrum modulation.
	EC502.5	Discuss the source coding and channel coding schemes for a given communication link and different types of error correcting codes.
EC 503 (A) (CNTI)	EC503.1	Design and analyze Symmetrical & Asymmetrical Attenuator.
	EC503.2	Design & analyze various filters.
	EC503.3	Students should be able to synthesize various Causer & Foster networks.
	EC503.4	Students should develop skills to solve problems in transmission lines using mathematical techniques and scientific knowledge.
	EC503.5	Analyze and understand the concept of various transmission lines.
EC 504 (B) (Computer System Organization)	EC504.1	To identify the basic structure, internal organization and operations of a digital computer.
	EC504.2	Analyze the working of micro programmed controllers with firmware and hardwired control units.
	EC504.3	Classify and analyze the modes of data transfer with reference to input output organization in a computer system.
	EC504.4	To understand the concept of memory hierarchy, cache memory, virtual memory in new generation computers
	EC504.5	To apply the concepts of parallel processing, pipelining and interprocessor communication in multiprocessors.
EC 505 (CNTL Lab)	EC505.1	Design and analyze Symmetrical & Asymmetrical Attenuator.
	EC505.2	Design & analyze various filters.
	EC505.3	Students should be able to synthesize various Causer & Foster networks.
	EC505.4	Students should develop skills to solve problems in transmission lines using mathematical techniques and scientific knowledge

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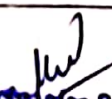
	EC505.5	Analyze and understand the concept of various transmission lines.
EC 506 (Matlab Programming)	EC506.1	To study MATLAB environment, data types, variables, operators and assignment statements in MATLAB and able to use Matlab for interactive computations
	EC506.2	To implement the arithmetic operations and familiar with vector, matrices and array and their use.
	EC506.3	Able to use basic flow controls (if-else, for, while) to implement the control structures in MATLAB,
	EC506.4	Able to program scripts and functions using the Matlab development environment and generate plots and export this for use in reports and presentations.
EC-507 (Evaluation Internship-II)	EC507.1	To Describe the everyday operations of an agency or organization.
	EC507.2	Student will able to Identify the ethical standards of behavior for professionals and interns within the agency/organization.
	EC507.3	Students will be able to Focus professional soft skills such as communication, punctuality and time management.
	EC507.4	Student will be able to Manage various personal habits or a social skill to deal better with work situations
	EC507.5	Build a professional network that can be a resource for the student
EC-508 (Minor Project- I)	EC508.1	Describe how to convert real problems to provide problem based solution.
	EC508.2	Demonstrate the product based and application based solution of problems.
	EC508.3	Analysis of system modules according to the requirement.
	EC508.4	Designing of the system architecture, UML diagrams and report writing.
	EC508.5	Evaluate structural as well as functional testing after developing test case.

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B.Tech ECE 6 <sup>th</sup> Sem		
Course Code/Course Name	Course Outcomes	
EC-601 (Digital-Signal Processing)	EC601.1	To understand the concept of Digital Signal Processing.
	EC601.2	Ability to design different types of systems.
	EC601.3	Ability to solve Numerical problems on Z transform.
	EC601.4	To understand the concept of transform i.e. DFT & FFT.
	EC601.5	To understand the concept of FIR & IIR.
EC-602 (Antenna & Wave propagation)	EC602.1	To understand & apply radio wave propagation modes & mechanisms to real world communication systems
	EC602.2	To demonstrate functions of antenna and compare various parameters of different antennas for analysis
	EC602.3	Students will be able to describe the various types of transmitting and receiving UHF & VHF antennas and be able to design them for real problems.
	EC602.4	Analyze the Hertzian and Half wave dipole antenna using Maxwell's equations to determine the electric and magnetic field components.
	EC602.5	Identify different types of arrays, able to apply & design of uniform linear and planar antenna arrays for isotropic and directional sources
	EC602.6	Able to test antenna parameters and understand advanced topics in antennas and propagation, develop novel antenna designs.
EC 603(A) (Data Communication)	EC603.1	Student will be able to understand and apply the basic concept of data \ communication in data communication networks.
	EC603.2	Students will be able to interpreting and applying different layer function of network model to design data communication networks
	EC603.3	Students will be able to interrogating different data link and network layer protocol
	EC603.4	Students will be able to know categories of networks, networking devices and apply to realize a network
EC 604(C) (Power Electronics)	EC604.1	Relate basic semiconductor physics to properties of power semiconductor devices, and combine circuit mathematics and characteristics of linear and non-linear devices.
	EC604.2	Describe basic operation and compare performance of various power devices, passive components and switching circuits.
	EC604.3	Design and Analyze power converter circuits and learn to select suitable power electronic devices by assessing the requirements of application fields.
	EC604.4	Formulate and analyze a power electronic design at the system level and assess the performance.

  
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EC-605 (Data Communication Lab)	EC605.1	Analyzing different layer function of network model
	EC605.2	Student will be able to apply concept of data communication for LAN designing.
	EC605.3	Student will be able to understand the concept of security in data communication.
EC 606 (Microcontroller Embedded system)	EC606.1	Student will be able to understand and apply the arithmetic, logical & bit manipulating instructions and its programming using microcontroller & embedded system.
	EC606.2	Students will be able to applying the programming concepts to control dc motor & stepper motor using microcontroller & embedded system. .
	EC606.3	Students will be able to applying the programming concept of reading the inputs from keyboard and sensors using microcontroller & embedded system.
	EC606.4	Students will be able to applying the programming concept of display the data on output device like LCD using microcontroller & embedded system..
	EC606.5	Students will be able to applying the programming concept of generating signals using microcontroller & embedded system. .
EC 607 (Internship-III)	EC607.1	To Describe the everyday operations of an agency or organization.
	EC607.2	Students will be able to Identify the ethical standards of behavior for professionals and interns within the agency/organization.
	EC607.3	Students will be able to Focus professional soft skills such as communication, punctuality and time management.
	EC607.4	Student will be able to Manage various personal habits or a social skill to deal better with work situations
	EC607.5	Build a professional network that can be a resource for the student
EC 608 (Minor Project II)	EC608.1	Designing of the project with modern programming languages
	EC608.2	Development of the project components module wise.
	EC608.3	Testing and analysis of project with various test cases and tools.
	EC608.4	Evaluate the project for deployment in different environment.
	EC608.5	Maintenance the project involving the changing and updating the modules as per requirements.

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B.Tech ECE 7 <sup>th</sup> Sem		
Course Code/Course Name	Course Outcomes	
EC 701 (VLSI Design)	EC701.1	Able to understand basic CMOS circuits and properties of CMOS transistors and able to draw stick diagrams and layout of CMOS circuits.
	EC701.2	Able to do CMOS realization for combinational logic design and analyze the delay models for combinational circuits and understand power dissipation and low power design principles in CMOS circuits.
	EC701.3	Able to analyze sequential logic circuits and understand memory architecture and low power memory circuits.
	EC701.4	Demonstrate an understanding of the working principle of operation of different types of memories.
	EC701.5	Able to understand the techniques of chip design using programmable devices and understand the architecture and routing procedures.
EC-702(A) (Microwave Engg)	EC702.1	Student will able to understand the concept of microwave engineering
	EC702.2	Identify various types of Microwave electronic components and systems.
	EC702.3	Solving complex RF & Microwave communication network design problems S-Parameter
	EC702.4	Analysis of various microwave component
	EC702.5	Understand about high frequency circuits and systems.
EC 703(A) (Cellular Mobile Communication)	EC703.1	To understand and analyze the basic principles, cellular concepts and design of mobile communication system
	EC703.2	To apply Frequency allocation, Reuse concepts for mobile communication
	EC703.3	To analyze Various interferences and reduction techniques
	EC703.4	To analyze Handoff & frequency management techniques
	EC703.5	Able to differentiate various cellular generation, standards and trends
EC 704 (Microwave Lab)	EC704.1	Student will able to understand the concept of microwave engineering
	EC704.2	Identify various types of Microwave electronic components and systems.
	EC704.3	Solving complex RF & Microwave communication network design problems S-Parameter.
	EC704.4	Analysis of various microwave component
	EC704.5	Understand about high frequency circuits and systems.
EC 705 (I.O.T. Lab)	EC705.1	To understand about the fundamentals of Internet of Things and its building blocks along with their characteristics.
	EC705.2	The students will be able to use the IoT technologies in practical domains of society.
	EC705.3	The students will be able to gain knowledge about the state of the art methodologies in IoT application domains.
EC 706 (Major Project-I)	EC706.1	Apply critical and creative thinking in the design of engineering projects, Plan and manage your time effectively as a team

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	EC706.2	Consider the business context and commercial positioning of designed devices or systems and apply knowledge of the 'real world' situations that a professional engineer can encounter
	EC706.3	Use fundamental knowledge and skills in engineering and apply it effectively on a project and design and develop a functional product prototype while working in a team
	EC706.4	Undertake an engineering project under mentorship and timely reflect on your own and peers' technical and non-technical learning
	EC706.5	Orally present and demonstrate your product to peers, academics, general and industry community and Manage any disputes and conflicts within and outside your team

  
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B.Tech ECE 8 <sup>th</sup> Sem		
Course Code/Course Name	Course Outcomes	
EC 801 (Optical Fiber Communication)	EC801.1	Understand Optical Fiber Communication System and its parameters.
	EC801.2	Analyze transmission characteristics of optical fiber
	EC801.3	Understand the construction and operation of various optical sources and detectors.
	EC801.4	Performance analysis of optical receivers and study of fiber joints
	EC801.5	Brief introduction of optical fiber networks and amplifiers
EC 802(B) (Wireless Communication)	EC802.1	Demonstrate their understanding on functioning of wireless communication system and evolution of different wireless communication systems and standards.
	EC802.2	Compare different technologies used for wireless communication systems.
	EC802.3	Explain the architecture, functioning, protocols, capabilities and application of various wireless communication networks.
	EC802.4	Demonstrate an ability explain multiple access techniques for Wireless Communication
	EC802.5	Demonstrate an ability to evaluate design challenges, constraints and security issues associated with Ad-hoc wireless networks.
EC 803(A) (Wireless Network)	EC803.1	Apply the concept of mobile telephony to explore the wireless communications in detail.
	EC803.2	Analyze the connectivity, coverage and integrated connectivity-coverage issues and solutions.
	EC803.3	Implementing the concept of Routing protocol for application of various wireless communication networks.
	EC803.4	Apply knowledge of wireless sensor networks (WSNs) to solve problems creatively in various application areas understand the design perspective of transition from WSN to IoT
	EC803.5	Ability to apply the design perspective of transition from WSN to IoT
EC 804 (Advanced Communication Engg. Lab)	EC804.1	Student will be able to understand the concepts of Amplitude Shift Keying Modulation and Demodulation and Frequency shift keying Modulation and Demodulation.
	EC804.2	Students will be able to applying the concepts to BPSK, QPSK, QAM Generation and Detection
	EC804.3	Students will be able to applying the concept of multiplexing of signals like TDM and WDM.
EC 804 (Major Project-II)	EC805.1	Apply critical and creative thinking in the design of engineering projects, Plan and manage your time effectively as a team
	EC805.2	Consider the business context and commercial positioning of designed devices or systems and apply knowledge of the 'real world' situations that a professional engineer can encounter

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	EC805.3	Use fundamental knowledge and skills in engineering and apply it effectively on a project and design and develop a functional product prototype while working in a team
	EC805.4	Undertake an engineering project under mentorship and timely reflect on your own and peers' technical and non-technical learning
	EC805.5	Orally present and demonstrate your product to peers, academics, general and industry community and Manage any disputes and conflicts within and outside your team.


  
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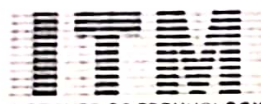


## Department of EC and Electrical Engineering

### Academic Year 2019-20

B. Tech ECE 3 <sup>rd</sup> Sem		
Course Code/Course Name	Course Outcomes	
BT 301 (Mathematics-III)	BT301.1	Ability to Understand and evaluate the zero of algebraic and transcendental equations, simultaneous linear equations with the help of Numerical Methods
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	EC405.2	To understand the basic characteristics of Integrated circuits and apply them in various circuits
	EC405.3	Able to design circuits using operational amplifiers for various applications.
	EC405.4	To analyze the IC 555 Timer concept in various analog circuits.
	EC405.5	To study and apply various voltage regulators in electronic circuits.

  
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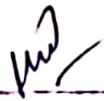


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EC 406 (Simulation Lab)	EC406.1	Student will be able to understand use and application of lab electronic instruments like CRO, function generators in electronics circuits in Multiuse/Proteus
	EC406.2	Students will be able to identify /specify the parts, packages, pin names, libraries, footprints of the electronic components in Multiuse/Proteus
	EC406.3	Students will be able to understand the concept of part lists, net lists, making net list files in Multiuse/Proteus
	EC406.4	Students will be able to know general PCB designing terms and process: Placing Parts, Routing Traces, Modifying Traces, Mounting Holes, Adding Text, PCB Layout, DRC, Pattern Transfer etc. in Multiuse/Proteus
	EC406.5	Students will be able to understand the ASSEMBLING AND TESTING : Identifying the components and its location on the PCB, soldering of active and passive components, Testing the assembled circuit for correct functionality, Prototype designing etc. using Multiuse/Proteus.

  
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B.Tech ECE 5 <sup>th</sup> Sem		
Course Code/Course Name	Course Outcomes	
EC 501 (Microprocessor its Application)	EC501.1	Student will be able to understand architecture and operation of 8086 Microprocessor
	EC501.2	Students will be able to interpreting and applying programming concept of 8086 microprocessor
	EC501.3	Students will be able to understand the concept of various interfacing chips like 8155, 8255 etc.
	EC501.4	Students will be able to know General purposes programmable peripheral devices like: DMA, USART etc
	EC501.5	Students will be able to understand the architecture and operation of 8051 microcontroller
EC 502 (Digital Communication)	EC502.1	Apply the knowledge of statistical theory of communication and explain the conventional digital communication system.
	EC502.2	Evaluate the performance of PCM, DPCM and DM in a digital communication system.
	EC502.3	The ability to design pass band digital modulation systems and techniques with desired specifications.
	EC502.4	Describe and analyze the digital communication system with spread spectrum modulation.
	EC502.5	Discuss the source coding and channel coding schemes for a given communication link and different types of error correcting codes.
EC 503 (A) (CNTI)	EC503.1	Design and analyze Symmetrical & Asymmetrical Attenuator.
	EC503.2	Design & analyze various filters.
	EC503.3	Students should be able to synthesize various Cauer & Foster networks.
	EC503.4	Students should develop skills to solve problems in transmission lines using mathematical techniques and scientific knowledge.
	EC503.5	Analyze and understand the concept of various transmission lines.
EC 504 (B) (Computer System Organization)	EC504.1	To identify the basic structure, internal organization and operations of a digital computer.
	EC504.2	Analyze the working of micro programmed controllers with firmware and hardwired control units.
	EC504.3	Classify and analyze the modes of data transfer with reference to input output organization in a computer system.
	EC504.4	To understand the concept of memory hierarchy, cache memory, virtual memory in new generation computers
	EC504.5	To apply the concepts of parallel processing, pipelining and interprocessor communication in multiprocessors.
EC 505 (CNTL Lab)	EC505.1	Design and analyze Symmetrical & Asymmetrical Attenuator.
	EC505.2	Design & analyze various filters.
	EC505.3	Students should be able to synthesize various Cauer & Foster networks.
	EC505.4	Students should develop skills to solve problems in transmission lines using mathematical techniques and scientific knowledge

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	EC505.5	Analyze and understand the concept of various transmission lines.
EC 506 (Matlab Programming )	EC506.1	To study MATLAB environment, data types, variables, operators and assignment statements in MATLAB and able to use Matlab for interactive computations
	EC506.2	To implement the arithmetic operations and familiar with vector, matrices and array and their use.
	EC506.3	Able to use basic flow controls (if-else, for, while) to implement the control structures in MATLAB,
	EC506.4	Able to program scripts and functions using the Matlab development environment and generate plots and export this for use in reports and presentations.
EC-507 (Evaluation Internship-II)	EC507.1	To Describe the every day operations of an agency or organization.
	EC507.2	Student will able to Identify the ethical standards of behavior for professionals and interns within the agency/organization.
	EC507.3	Students will be able to Focus professional soft skills such as communication, punctuality and time management.
	EC507.4	Student will be able to Manage various personal habits or a social skill to deal better with work situations
	EC507.5	Build a professional network that can be a resource for the student
EC-508 (Minor Project- I)	EC508.1	Describe how to convert real problems to provide problem based solution.
	EC508.2	Demonstrate the product based and application based solution of problems.
	EC508.3	Analysis of system modules according to the requirement.
	EC508.4	Designing of the system architecture, UML diagrams and report writing.
	EC508.5	Evaluate structural as well as functional testing after developing test case.

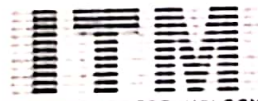
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B.Tech ECE 6 <sup>th</sup> Sem		
Course Code/Course Name	Course Outcomes	
EC-601 (Digital-Signal Processing)	EC601.1	To understand the concept of Digital Signal Processing.
	EC601.2	Ability to design different types of systems.
	EC601.3	Ability to solve Numerical problems on Z transform.
	EC601.4	To understand the concept of transform i.e. DFT & FFT.
	EC601.5	To understand the concept of FIR & IIR.
EC-602 (Antenna & Wave propagation)	EC602.1	To understand & apply radio wave propagation modes & mechanisms to real world communication systems
	EC602.2	To demonstrate functions of antenna and compare various parameters of different antennas for analysis
	EC602.3	Students will be able to describe the various types of transmitting and receiving UHF & VHF antennas and be able to design them for real problems.
	EC602.4	Analyze the Hertzian and Half wave dipole antenna using Maxwell's equations to determine the electric and magnetic field components.
	EC602.5	Identify different types of arrays. able to apply & design of uniform linear and planar antenna arrays for isotropic and directional sources
	EC602.6	Able to test antenna parameters and understand advanced topics in antennas and propagation, develop novel antenna designs.
EC 603(A) (Data Communication)	EC603.1	Student will be able to understand and apply the basic concept of data \ communication in data communication networks.
	EC603.2	Students will be able to interpreting and applying different layer function of network model to design data communication networks
	EC603.3	Students will be able to interrogating different data link and network layer protocol
	EC603.4	Students will be able to know categories of networks, networking devices and apply to realize a network
EC 604(C) (Power Electronics)	EC604.1	Relate basic semiconductor physics to properties of power semiconductor devices, and combine circuit mathematics and characteristics of linear and non-linear devices.
	EC604.2	Describe basic operation and compare performance of various power devices, passive components and switching circuits.
	EC604.3	Design and Analyze power converter circuits and learn to select suitable power electronic devices by assessing the requirements of application fields.
	EC604.4	Formulate and analyze a power electronic design at the system level and assess the performance.

  
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EC-605 (Data Communication Lab)	EC605.1	Analyzing different layer function of network model
	EC605.2	Student will be able to apply concept of data communication for LAN designing.
	EC605.3	Student will be able to understand the concept of security in data communication.
EC 606 (Microcontroller Embedded system)	EC606.1	Student will be able to understand and apply the arithmetic, logical & bit manipulating instructions and its programming using microcontroller & embedded system.
	EC606.2	Students will be able to applying the programing concepts to control dc motor & stepper motor using microcontroller & embedded system. .
	EC606.3	Students will be able to applying the programming concept of reading the inputs from keyboard and sensors using microcontroller & embedded system.
	EC606.4	Students will be able to applying the programming concept of display the data on output device like LCD using microcontroller & embedded system..
	EC606.5	Students will be able to applying the programming concept of generating signals using microcontroller & embedded system. .
EC 607 (Internship-III)	EC607.1	To Describe the everyday operations of an agency or organization.
	EC607.2	Students will be able to Identify the ethical standards of behavior for professionals and interns within the agency/organization.
	EC607.3	Students will be able to Focus professional soft skills such as communication, punctuality and time management.
	EC607.4	Student will be able to Manage various personal habits or a social skill to deal better with work situations
	EC607.5	Build a professional network that can be a resource for the student
EC 608 (Minor Project II)	EC608.1	Designing of the project with modern programning languages
	EC608.2	Development of the project components module wise.
	EC608.3	Testing and analysis of project with various test cases and tools.
	EC608.4	Evaluate the project for deployment in different environment.
	EC608.5	Maintenance the project involving the changing and updating the modules as per requirements.

  
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B.Tech ECE 7 <sup>th</sup> Sem		
Course Code/Course Name	Course Outcomes	
EC 7001 (Microwave Engg)	EC7001.1	Able to understand basic CMOS circuits and properties of CMOS transistors and able to draw stick diagrams and layout of CMOS circuits.
	EC7001.2	Able to do CMOS realization for combinational logic design and analyze the delay models for combinational circuits and understand power dissipation and low power design principles in CMOS circuits.
	EC7001.3	Able to analyze sequential logic circuits and understand memory architecture and low power memory circuits.
	EC7001.4	Demonstrate an understanding of the working principle of operation of different types of memories.
	EC7001.5	Able to understand the techniques of chip design using programmable devices and understand the architecture and routing procedures.
EC-7002(Satellite Communication)	EC7002.1	Student will able to understand the concept of microwave engineering
	EC7002.2	Identify various types of Microwave electronic components and systems.
	EC7002.3	Solving complex RF & Microwave communication network design problems S-Parameter
	EC7002.4	Analysis of various microwave component
	EC7002.5	Understand about high frequency circuits and systems.
EC-7003(Optical Communication)	EC7003.1	To understand and analyze the basic principles, cellular concepts and design of mobile communication system
	EC7003.2	To apply Frequency allocation, Reuse concepts for mobile communication
	EC7003.3	To analyze Various interferences and reduction techniques
	EC7003.4	To analyze Handoff & frequency management techniques
	EC7003.5	Able to differentiate various cellular generation, standards and trends
EC 7004 (Data Communication)	EC7004.1	Student will able to understand the concept of microwave engineering
	EC7004.2	Identify various types of Microwave electronic components and systems.
	EC7004.3	Solving complex RF & Microwave communication network design problems S-Parameter.
	EC7004.4	Analysis of various microwave component
	EC7004.5	Understand about high frequency circuits and systems.
EC 7005 (Wireless Communication)	EC7005.1	To understand about the fundamentals of Internet of Things and its building blocks along with their characteristics.
	EC7005.2	The students will be able to use the IoT technologies in practical domains of society.
	EC7005.3	The students will be able to gain knowledge about the state of the art methodologies in IoT application domains.
EC 7006 (Major Project-I)	EC7006.1	Apply critical and creative thinking in the design of engineering projects, Plan and manage your time effectively as a team

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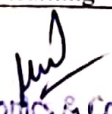
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	EC7006.2	Consider the business context and commercial positioning of designed devices or systems and apply knowledge of the 'real world' situations that a professional engineer can encounter
	EC7006.3	Use fundamental knowledge and skills in engineering and apply it effectively on a project and design and develop a functional product prototype while working in a team
	EC7006.4	Undertake an engineering project under mentorship and timely reflect on your own and peers' technical and non-technical learning
	EC7006.5	Orally present and demonstrate your product to peers, academics, general and industry community and Manage any disputes and conflicts within and outside your team

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## Department of EC and Electrical Engineering

B.Tech ECE 8 <sup>th</sup> Sem		
Course Code/Course Name	Course Outcomes	
EC-8001(VLSI Design)	EC8001.1	Understand Optical Fiber Communication System and its parameters.
	EC8001.2	Analyze transmission characteristics of optical fiber
	EC8001.3	Understand the construction and operation of various optical sources and detectors.
	EC8001.4	Performance analysis of optical receivers and study of fiber joints
	EC8001.5	Brief introduction of optical fiber networks and amplifiers
EC 8002 (Advanced Communication System)	EC8002.1	Student will be able to understand the concept of microwave engineering.
	EC8002.2	Identify of various types of Microwave electronic components and systems.
	EC8002.3	Solving complex RF & Microwave communication network design problems S-Parameter
	EC8002.4	Analysis of various microwave component
	EC8002.5	Understand about high frequency circuits and systems.
EC 8003 (Principles Management Economics)	EC8003.1	Apply the concept of mobile telephony to explore the wireless communications in detail.
	EC8003.2	Analyze the connectivity, coverage and integrated connectivity-coverage issues and solutions.
	EC8003.3	Implementing the concept of Routing protocol for application of various wireless communication networks.
	EC8003.4	Apply knowledge of wireless sensor networks (WSNs) to solve problems creatively in various application areas understand the design perspective of transition from WSN to IoT
	EC8003.5	Ability to apply the design perspective of transition from WSN to IoT
EC 8004 (Radar Engineering)	EC8004.1	Student will be able to understand the concepts of Amplitude Shift Keying Modulation and Demodulation and Frequency shift keying Modulation and Demodulation.
	EC8004.2	Students will be able to applying the concepts to BPSK, QPSK, QAM Generation and Detection
	EC8004.3	Students will be able to applying the concept of multiplexing of signals like TDM and WDM.
EC 8005 (Major Project-II)	EC8005.1	Apply critical and creative thinking in the design of engineering projects, Plan and manage your time effectively as a team
	EC8005.2	Consider the business context and commercial positioning of designed devices or systems and apply knowledge of the 'real world' situations that a professional engineer can encounter
	EC8005.3	Use fundamental knowledge and skills in engineering and apply it effectively on a project and design and develop a functional product prototype while working in a team
	EC8005.4	Undertake an engineering project under mentorship and timely reflect on your own and peers' technical and non-technical learning

  
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	EC8005.5	Orally present and demonstrate your product to peers, academics, general and industry community and Manage any disputes and conflicts within and outside your team.
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