Hope Foundation’s

International Institute of Information Technology

P-14, Rajiv Gandhi Info Park, Phase 1, Hinjawadi, Pune 411057

Department of Electronics and Telecommunication

**Course Outcomes (COs)**

**TE (Electronics and Telecommunication) – 2019 Pattern**

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| CourseCode | Name ofSubject/Course | Course Outcomes (Cos) |
| 304181 | Digital Communication | * Apply the statistical theory for describing various signals in a communication system.
* Explain and compare various digital modulation techniques used in digital communication systems and analyze their performance in presence of AWGN noise.
* Explain and compare various digital modulation techniques used in digital communication systems and analyze their performance in presence of AWGN noise.
* Describe and analyze the digital communication system with spread spectrum modulation.
* Analyze a communication system using information theoretic approach.
* Use error control coding techniques to improve performance of a digital communication system. .
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|  304182 | Electromagnetic Field Theory | * Apply the basic electromagnetic principles and determine the fields (E & H) due to the given source.
* Apply boundary conditions to the boundaries between various media to interpret behavior of the fields on either side.
* State, Identify and Apply Maxwell's equations (integral and differential forms) in both the forms (Static, time-varying or Time-harmonic field) for various sources, Calculate the time average power density using Poynting Theorem, Retarded magnetic vector potential.
* Formulate, Interpret and solve simple uniform plane wave (Helmholtz Equations) equations, and analyze the incident/reflected/transmitted waves at normal incidence.
* Interpret and apply the transmission line equation to transmission line problems with load impedance to determine input and output voltage/current at any point on the Transmission line, find input/load impedance, input/load admittance, reflection coefficient, SWR, Vmax/Vmin, length of transmission line using Smith Chart.

Carry out a detailed study, interpret the relevance and applications of Electromagnetics.  |

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| 304183 | Database Management | * Design E-R Model for given requirements and convert the same into database tables
* Design and implement a database schema for a given problem-domain using data model.
* Formulate, using SQL/DML/DDL commands, solutions to a wide range of query and update problems.
* Implement transactions, concurrency control, and be able to do Database recovery.
* Explain Parallel Database Architectures and its applications.
* Explain Distributed Databases and its applications
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| 304184 | Microcontroller | * Understand architecture and features of 8051 and PIC18FXX Microcontroller.
* Learn interfacing of real-world peripheral devices with microcontroller.
* Explore different features of PIC 18F Microcontroller with Architecture.
* Use concepts of timers and interrupts of PIC 18 in programming.
* Design and develop microcontroller based embedded application.
* Demonstrate real life applications using PIC 18.
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| 304185 C | Fundamentals of JAVA Programming | * Demonstrate the basic principles of Java programming language.
* Apply the concepts of classes and objects to write programs in Java.
* Demonstrate the concepts of methods & Inheritance.
* Implement JAVA program using the concepts of interfaces & packages.
* Develop robust programs using multithreading and Exception handling in Java.
* Demonstrate Graphics class, AWT packages and manage input and output files in Java.
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| 304185 D | Computer Networks | * Design LAN using appropriate networking architecture, topologies, transmission media, and networking devices.
* Understand the working of controlling techniques for flawless data communication using datalink layer protocols.
* Learn the functions of network layer, various switching techniques and internet protocol addressing.
* Explore various interior and exterior, unicasting and multicasting protocols.
* Analyze data flow using TCP/UDP Protocols, congestion control techniques for QoS.
* Illustrate the use of protocols at application layer
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| 304186 | Digital Communication Lab | * Generate and observe various signals in a communication system.
* Explain and compare various digital modulation techniques used in digital communication systems and analyze their performance in presence of AWGN noise.
* Explain and compare various digital modulation techniques used in digital communication systems and analyze their performance in presence of AWGN noise.
* Describe and analyze the digital communication system with spread spectrum modulation.
* Analyze a communication system using information theoretic approach.
* Use error control coding techniques to improve performance of a digital communication system.
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| 304187 | Database Management Lab | * Populate and query a database using SQL DDL / DML / DCL commands.
* Implement PL/SQL code for given requirement using stored procedure and stored functions
* Implement PL/SQL code using Cursors to update/retrieve row by row data.
* Use Triggers to write PL/SQL code for automatic update in database on event occurrence.
* Implement MySQL database connectivity with Python/Java using JDBC/ODBC.
* Implement SQL DDL/ DML/ DCL query on database using simulator made available in Database Virtual Lab.
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| 304188 | Microcontrollers Lab | * To understand the programming microcontroller using C language
* To understand architecture and features of typical 8051 Microcontroller and understand need of microcontrollers in real life applications
* To learn interfacing of real-world peripheral devices and to study various hardware and software tools for developing applications with 8051 microcontrollers
* To understand architecture and features of typical PIC18f4550 Microcontroller and understand need of microcontrollers in real life applications
* To learn interfacing of real-world peripheral devices and to study various hardware and software tools for developing applications with PIC18f4550 microcontroller
* To learn interfacing of advanced peripheral devices and to study various hardware and software tools for developing applications for RTC, communication-based applications
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| 304189 C | Elective-I Lab- FJP Lab | * Demonstrate the basic principles of Java programming language
* Apply the concepts of classes and objects to write programs in Java
* Demonstrate the concepts of methods & Inheritance
* Implement JAVA program using the concepts of interfaces & packages
* Develop robust programs using multithreading and Exception handling in Java
* Demonstrate Graphics class, AWT packages and manage input and output files in Java
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| 304189 D | Elective-I Lab-CN Lab | * Design LAN using appropriate networking architecture, topologies, transmission media, and networking devices.
* Understand the working of controlling techniques for flawless data communication using data link layer protocols.
* Learn the functions of network layer, various switching techniques and internet protocol addressing.
* Explore various interior and exterior, unicasting and multicasting protocols.
* Analyze data flow using TCP/UDP Protocols, congestion control techniques for QoS.
* Illustrate the use of protocols at application layer
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| SEMESTER II |
| 304192 | Cellular Networks | * Calculate path loss and channel estimation coefficient for given condition.
* Discuss and study OFDM and MIMO concepts.
* Summarize fundamentals of mobile communication.
* Prepare link budget analysis and tele-traffic system modeling.
* Explain modern and futuristic wireless networks architecture.
* Explain performance analysis issues in wireless networks
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| 304193 | Project Management | * Apply the fundamental knowledge of project management for effectively handling the projects.
* Identify and select the appropriate project based on feasibility study and undertake its effective planning.
* "Assimilate effectively within the organizational structure of project and handle project management
* related issues in an efficient manner."
* Apply the project scheduling techniques to create a Project Schedule Plan and accordingly utilize the resources to meet the project deadline.
* Identify and assess the project risks and manage finances in line with Project Financial Management Process.
* Develop new products assessing their commercial viability and develop skillsets for becoming successful entrepreneurs while being fully aware of the legal issues related to Product development and Entrepreneurship.
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| 304194 | Power Devices & Circuits | * Explain working of power devices with gate drive circuits.
* To evaluate and analyze performance parameters of AC to DC controlled power converters and its topologies.
* To evaluate and analyze performance parameters of DC to AC controlled power converters and its topologies.
* To evaluate and analyze performance parameters of DC-to-DC controlled power converters and its topologies.
* Explain protection of Power Circuits.
* Explain working principle of electronic applications using power devices.
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| 304195 C | Elective -II Advanced JAVA Programming | * Design and develop GUI applications using Applets.
* Apply relevant AWT/ swing components to handle the given event
* Design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
* Access database through Java programs, using Java Database Connectivity (JDBC)
* Invoke the remote methods in an application using Remote Method Invocation (RMI)
* Develop program for client /server communication using Java Networking classes.
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| 304195 E | Elective -II Network Security | * Analyze attacks on computers and computer security.
* Demonstrate knowledge of cryptography techniques.
* Illustrate various Symmetric and Asymmetric keys for Ciphers
* Evaluate different Message Authentication Algorithms and Hash Functions
* Get acquainted with various aspects of E-Mail Security
* Assimilate various aspects of Web Security
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| 304196 | Cellular Networks Lab | * Compute the median loss by employing Hata model.
* Estimate fading channel coefficient, BER performance of Signe antenna, multi antenna AWGN and Rayleigh fading channel.
* Compute the RMS delay spread and doppler shift of received signal.
* Perform link budget analysis of given network.
* Implement OFDM and evaluate frame error rate against SNR.
* Simulate mobile environment to evaluate performance parameters.
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| 304197 | Power Devices & Circuits Lab | * To analyze performance of power devices
* To evaluate and analyze performance parameters of DC to AC controlled power converter.
* To evaluate and analyze performance parameters of AC to DC controlled power converter.
* To evaluate and analyze performance parameters of SMPS/UPS and AC voltage controller.
* To demonstrate speed torque characteristics of DC motor / single phase AC motor.
* To explain performance parameters of battery
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| 304198 C | Elective -II Advanced JAVA Programming Lab | * Design and develop GUI applications using Applets.
* Apply relevant AWT/ swing components to handle the given event
* Design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
* Access database through Java programs, using Java Database Connectivity (JDBC)
* Invoke the remote methods in an application using Remote Method Invocation (RMI)
* Develop program for client /server communication using Java Networking classes.
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| 304198 E | Elective -II Network Security Lab | * Analyze attacks on computers and computer security.
* Demonstrate knowledge of cryptography techniques.
* Illustrate various Symmetric and Asymmetric keys for Ciphers
* Evaluate different Message Authentication Algorithms and Hash Functions
* Get acquainted with various aspects of E-Mail Security
* Assimilate various aspects of Web Security
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| 304199 | Internship | * To develop professional competence through internship.
* To apply academic knowledge in a personal and professional environment.
* To build the professional network and expose students to future employees.
* Apply professional and societal ethics in their day-to-day life.
* To become a responsible professional having social, economic and administrative considerations.
* To make own career goals and personal aspirations.
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| 3041200 | Mini Project | * To understand the Product Development Process‟ including budgeting through Mini Project.
* To plan for various activities of the project and distribute the work amongst team members.
* To inculcate electronic hardware implementation skills by Learning PCB artwork design using an appropriate EDA tool, imbibing good soldering and effective trouble-shooting practices, following correct grounding and shielding practices.
* To develop student ‘s abilities to transmit technical information clearly and test the same by delivery of Seminar based on the Mini Project.
* To understand the importance of document design by compiling Technical Report on the Mini Project work carried out.
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