

Information to be submitted by Departments/Directorates/Centres for Each Programme Offered

| Department/Directorate/Centre/Institute: | Electronics and Communication Engineering Department, Institute of Technology, University of Kashmir, Zakura Campus | |
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| Name of the Programme Offered: | 1. B. Tech (Electronics and Communication Engineering) 2. M.Tech (Electronics and Communication Engineering) | |
| Departmental website link of the complete/updated syllabus: | https://iotece.uok.edu.in/Main/Default.aspx | |
| Number of Courses in the Programme? | 1. B. Tech (Electronics and Communication Engineering): 80(B.Tech) 2. M.Tech (Electronics and Communication Engineering): 23 (M.Tech) | |
| Number of New Courses introduced in the Programme since 2019? | 1. B. Tech (Electronics and Communication Engineering): 31(B.Tech) 2. M.Tech (Electronics and Communication Engineering): 23 (M.Tech) | |
| List of New Courses introduced since 2019: | | |
| Course Code | Course Title | Brief Description |
| PCCMECE101 (M.Tech) | Analog Integrated Circuit Design | This course will introduce advanced concepts in analog circuit design specifically relevant to CMOS IC design. It will cover circuit noise and mismatch, their analysis, and their impact on CMOS opamp design. At the end of this course, the student should be able to design and analyze several types of CMOS opamps at the transistor level |
| PCCMECE102 (M.Tech) | Advanced DSP | This course will introduce advanced concepts of designing filter using different algorithms. this will introduce the concepts of multi-rate DSP, solve numerical problems, theory of prediction and solution of normal equation. this will introduce the concepts of power spectral Estimation and its various methods. |
| PCCMECE103L (M.Tech) | Advanced Computation & Simulation Tools | in this course a student will learn three different skill development tools, ORCAD (Students will learn to circuit level designing, simulation etc). MATLAB(IN THIS TOOL STUDENTS WILL LEARN TO CREATE DIFFERENT SYSTEMS on discrete level. they will learn GUI designing, designing on Simulink which works on Block level, matlab Programming, Image processing, etc) and PYTHON(The goal of the course is to introduce students to Python Vx programming using hands on instruction.The approach will be to present an example followed by a small exercise where the learner tries something similar to solidify a concept.) |
| PEC1MECE1XX (M.Tech) | Digital image Processing (Professional Elective Course-I) | this course has been introduced to Review the fundamental concepts of a digital image processing system, Analyze images in the frequency domain using various transforms, Evaluate the techniques for image enhancement and image restoration, Categorize various compression techniques,Interpret Image compression standards, Interpret image segmentation and representation techniques etc |
| PCCMECE102L (M.Tech) | Advanced DSP Lab | Students would be able to simulate various signal processing algorithms and related applications like Sampling, discretization and reconstruction of signals, Digital signal generation, Image processing, Audio processing, Transform based compression, Filtering of noise, separation of signals etc. . |
| PCCMECE104 (M.Tech) | Research Methodology & Language | This has been introduced so that at the end of this course, the students should be able to: understand some basic concepts of research and its methodologies ,identify appropriate research topics ,select and define appropriate research problem and parameters ,prepare a project proposal (to undertake a project) ,organize and conduct research (advanced project) in a more appropriate manner ,write a research report and thesis ,write a research proposal (grants) |
| PECMECE1XXL (M.Tech) | Digital image Processing Lab(Professional Elective Course-I) | To introduce the concepts of image processing and basic analytical methods to be used in image processing. To familiarize students with image enhancement and restoration techniques, To explain different image compression techniques. To introduce segmentation and morphological processing techniques. |
| PCCMECE201 (M.Tech) | VLSI Design | The course is designed to familiarize studentswith the industry trends of IC fabrication. Starting with revisiting the conceots regaring MOSFETsand CMOS, students learn about CMOS circuits, logic implementation using CMOS, Logic design, Design Rules/Floor planning, Simple Layout Examples and RAM Cell Implementation. |
| PCCMECE202 (M.Tech) | Wireless Communication Systems | In this course the students will Analyse and design receiver and transmitter diversity techniques. Determine the appropriate transceiver design of multi-antenna systems and evaluate the data rate performance. Design wireless communication systems with key 3G (e.g., CDMA) and 4G (OFDM) technologies |
| PEC2MECE2XX (M.Tech) | Network security and cryptography (Professional Elective | The main objectives of this course are: to Learn the fundamentals of network coding theory, Understand the performance parameters required for network coding, Gain the knowledge of the network coding design methods, Learn different approaches for the network coding, Understand error correction and detection methods of adversarial errors. |
| PCCMECE201L (M.Tech) | VLSI Design Lab | this has been introduced so that the students will be able to:1. An ability to design CMOS logic circuits. 2. simulate circuits within a CAD tool and compare to design specifications.3..design, implement, and simulate circuits using VHDL.4. write machine language programs and assembly language programs for the simple computer.5. To learn by using Xilinx Foundation tools and Hardware Description Language (VHDL).6. To analyze the results of logic and timing simulations and to use these simulation results to debug digital systems. |
| PCCMECE202L (M.Tech) | Modern Wireless Communication Systems | The main objectives of the course are: Get familiar with the future wireless communication systems and concepts,Learn Signal and waveform design for communication and radar jointly, Learn how to design and transmit signals for communication and sensing purposes. |
| PEC2MECE2XXL (M.Tech) | Network security and cryptography lab (Professional Elective Course Lab-III) | The main objectives of this course are: to Learn the fundamentals of network coding theory, Understand the performance parameters required for network coding, Gain the knowledge of the network coding design methods, Learn different approaches for the network coding, Understand error correction and detection methods of adversarial errors. |
| PCCMECE203 (M.Tech) | Optimization Techniques | To impart knowledge in concepts and tools of operations research and to understand mathematical models for analyzing different situations in the Industrial/business scenario involving limited resources and finding the optimal solution within constraints. |
| PCCMECE207 (M.Tech) | Seminar | In this course, students in consultation with specific faculty member will carry out literature survey in specific research area of interest and periodically present his/her observations in the form of seminar presentation. Finally, the student will submit a report on his/her observation. Based on the literature review conducted, students will choose their project and thesis works to be carried out. |
| PEC3MECE3XX (M.Tech) | Deep learning (Profession | The main objective of this course is to make students comfortable with tools and techniques required in handling large amounts of datasets. They will also uncover various deep learning methods in NLP, Neural Networks etc. Several libraries and datasets publicly available will be used to illustrate the application of these algorithms. This will help students in developing skills required to gain experience of doing independent research and study. |
| PEC4MECE3XX (M.Tech) | Antenna Design (Professional Elective Course -IV) | Through this course Students will be able to understand the fundamental working principle of an antenna, To describe/explore the different antenna parameters like input impedance, far-field radiation patterns, reflection coefficient, etc, To apply the different feeding technique, To evaluate and perform the optimization to achieve a certain goal, To design the wire antennas, microstrip antennas, dielectric resonator antenna,to learn Samrt Antennas. learn antenna Synthesis etc |
| OECMECE3XX (M.Tech) | Coding Techniques (Open | in this course students will learn two components: 1. python 2. R language (students will learn Manipulate primitive data types in the R programming language, Construct and manipulate R data structures, including vectors, factors, lists, and data frame, Control program flow with conditions and loops, write functions, perform character string operations, write regular expressions, handle errors.Read, write, and save data files using R. |
| PEC3MECE3XXL (M.Tech) | Deep learning lab (Professional Elective Course Lab-III) | Through practical programming exercises, students will deepen their understanding of neural network based models. They will be exposed to various practical considerations, such as hyper-parameter tuning, which are crucial to make deep learning systems to perform well in practice. |
| PEC4MECE3XXL (M.Tech) | Antenna Design lab (Professional Elective Course Lab IV) | Through this course Students will be able to understand the fundamental working principle of an antenna, To describe/explore the different antenna parameters like input impedance, far-field radiation patterns, reflection coefficient, etc, To apply the different feeding technique, To evaluate and perform the optimization to achieve a certain goal, To design the wire antennas, microstrip antennas, dielectric resonator antenna,to learn Samrt Antennas, learn antenna Synthesis etc |
| OECMECE3XXL (M.Tech) | Coding Techniques Lab (Open Elective Course Lab-I) | This course introduces computer programming using the Python programming language and R language . Emphasis is placed on common algorithms and programming principles utilizing the standard library distributed with Python. Upon completion, students should be able to design, code, test, and debug Python language program. Students will learn Manipulate primitive data types in the R programming language, Construct and manipulate R data structures, including vectors, factors, lists, and data frame, Control program flow with conditions and loops, write functions, perform character string operations, write regular expressions, handle errors.Read, write, and save data files using R. |

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| PCCMECE314 (M.Tech) | Project Phase-I | To investigate the chosen topic in depth. This implies collecting and reviewing literature (e.g. books, papers, journals, websites, proceedings etc.) and understanding and interpreting the most up-to-date concepts and theories of your chosen academic field and/or thesis topic. |
| PCCMECE401 (M.Tech) | Phase - II Dissertation | The Dissertation Work is by far the most important single piece of research work in the post-graduate programme. It provides the opportunity for student to demonstrate independence and originality, to plan and organize a large Dissertation over a long period and to put into practice some of the techniques student have been taught throughout the course. The students are advised to choose a Dissertation that involves a combination of sound background research, a solid implementation, or piece of theoretical work, and a thorough evaluation of the Dissertation's output in both absolute and relative terms. Interdisciplinary Dissertation proposals and innovative Dissertations are encouraged and more appreciable. |
| ELE20103 (B.Tech) | Principles of Electrical Engineering | This course is designed to make students familiar with 1. The basic concepts and terminologies of Electrical circuits (AC and DC) and various laws governing the behaviour of voltage and current in simple and complex circuits. 2. Various electrical components, sources and their mathematical relations. 3. basic concepts and laws of magnetism produced in an electrical circuit. 4. Basics of Electrical machines (Transformers, Generators and motors) and Measurement devices (Ammeter, Voltmeter etc.) |
| CHM20104 (B.Tech) | Environmental Science | This course will make students familiar with factors affecting Environment, the composition of Atmosphere, sources and effects of Air pollution, Global warming and its causes and impacts, climate change, acid rain, ozone layer depletion, hydrosphere, causes and effects of water pollution, Conservation and treatment of water, Sustainable Development and various Social and economic issues. |
| ECE20203 (B.Tech) | Fundamentals of Electronic Engineering | This course will give students an understanding of electronics and applications of electronic systems in real life. It will also enable students to understand basic concepts and terminologies regarding semiconductor materials. Students will acquire theoretical knowledge about various diodes, transistors and electronic measurement devices. Basic concepts of digital electronics and other devices like microprocessors and microcontrollers. |
| ECE20203L (B.Tech) | Fundamentals of Electron | The experiments for this Laboratory sessions are designed to give the students a hands-on training experience with various diodes and their circuits for various applications, various transistor configurations and circuits, logic gates and combinational/sequential circuits. |
| MEC20105 (B.Tech) | Engineering Mechanics | This course focuses to provide an introductory treatment of Engineering Mechanics to the students with a view to prepare a good foundation for taking up advanced courses in the area in the subsequent semesters. Also provide a working knowledge of statics with emphasis on force equilibrium and free body diagrams and understanding of different kinds of stress and deformation and how to determine them in a wide range of simple, practical structural problems, and an understanding of the mechanical behaviour of materials under various load conditions. |
| CSE20204 (B.Tech) | Computer Programming with C | This course introduces the concept of problem solving through programming and the basics of C language character set, data types, operators, expressions and statements, control structure of C including branches and loops, concept of arrays, pointers and functions, and illustrate their use in real world problems. It also makes students familiar with structures, unions and basic operations on files. |
| ELE20103L (B.Tech) | Principles of Electrical Engineering Lab | To introduce the use of measuring instruments (Voltmeter, Ammeter, Multi-meter, Oscilloscope, LCRQ meter) to verify various laws studied in theory and study the behaviour of basic electrical components. |
| MEC20107B (B.Tech) | Workshop Practice B | Introduction to various machining and metal cutting processes and tools, different welding processes, tools and equipments, introduction to casting processes, familiarization of electrical and electronic tools and instrument, Safety precautions, processes, jobs, repair etc. |
| CSE20204L (B.Tech) | Computer Programming with C Lab | In this Lab students will work on their programming skills by creating Algorithms and programs for various tasks. Understand basics of C and its usefulness in carrying out various tasks. |
| PCCECE34 (B.Tech) | Digital System Design - I | To provide students with an introduction to Digital Electronics, Digital Systems and Digital Logic, Boolean Algebra, Number systems and their inter-conversion, truth tables, Karnaugh maps, Logic gates, digital logic families, sequential and combinational circuits. |
| ESCECE35 (B.Tech) | Data Structures | To equip students with basic knowledge of complex programming concepts, data structures like arrays, strings, linked lists, stacks, queues, hash tables, trees and techniques like sorting and searching. |
| PCCECE34L (B.Tech) | Digital System Design Lab - I | This lab course is designed to give students a comprehensive knowledge of Digital circuits in IC packages. Students can make use of bread boards for implementing various gates, logic families, combinational and sequential circuits. |
| ESCECE35L (B.Tech) | Data Structures Lab | The Lab course will allow students to implement various data structures on a computer and carry out various operations like traversal, searching, sorting, Dijkstra's algorithm using priority queues. Prim's and Kruskal's algorithms. |
| PCCECE36L (B.Tech) | EDA Tools Lab - I | This specially designed Lab course is designed to provide students hands-on experience on advanced Atmega microcontroller based prototyping board - Arduino and its programming for various scenarios and applications. |
| PCCECE43 (B.Tech) | Digital System Design - II | This course is a continuation to DSD-I and uses the concepts developed previously to introduce the student to complex sequential circuits like registers, design of ADC and DAC, memories (ROM, R/W memory, CCD memory etc.), PLA, PLDs, CPLDs and FPGAs. VHDL is also a part of this course. |
| ESCECE46 (B.Tech) | OOPS with Java | This course is an introduction for an electronics engineer to the world of Object oriented programming. The student will learn about Tokens, Expressions, Control Structures, Inheritance & Packaging, Handling Error / Exceptions, Strings, Threads, I/O packages, applications and Database programming. |
| PCCECE43L (B.Tech) | Digital System Design Lab - II | This Lab course will give students opportunity to design various digital circuits (Logic gates, Sequential and combinational) using VHDL and Implementation using Xilinx/Spartan Kits. |
| PCCECE44L (B.Tech) | Signals and Systems Lab | This Lab course will give students an introduction to MATLAB programs on basic and logical operations on matrices, function files, signals and sequences, generation of even & odd components of a signal, convolution of continuous time signals & discrete time sequences, Auto correlation and Cross correlation, Gibbs phenomenon, Fourier analysis and properties, Plot magnitude and Phase response of a given system, Inverse Fourier transform, Laplace transform and its Inverse, Discrete time Fourier transform and its Inverse, Z-transform and its Inverse. |
| PCCECE46L (B.Tech) | EDA Tools Lab - II | In continuation with the previous EDAT course, in this course students will work on MATLAB GUI Design and introduction Of Graphical User Interface, GUI Function Property, GUI Component Design, GUI Container, Writing the code of GUI Callback, Dialog Box, Menu Designing, applications, MATLAB SIMULINK, Image Processing with MATLAB, Symbolic Math in MATLAB. The students will also get an introduction to PCB design, process and flow. Introduction to PCB Fabrication & Assembly |
| PCCECE51 (B.Tech) | Information Theory and Coding | This course will give students knowledge of concepts regarding digital communication e.g. probability, random variable, process, channel coding theorems, Shannon's theorem, channel capacity, AWGN channel, error control codes. Advanced concepts like codes for 5G/6G, information theory for machine learning etc. |
| PCCECE56L (B.Tech) | EDA Tools Lab - III | This course has been as a skill building exercise getting familiar with versatile programming language Python, Computational Modelling Programming, Python for scientific computing, Optimisation strategies, Prototyping in Python, familiarity with various libraries and toolkits e.g. SymPy, NumPy, PyLab, SciPy etc. Implementation of projects using Raspberry Pi. |
| PCCECE65 (B.Tech) | VLSI Design | The course is designed to familiarize students with the industry trends of IC fabrication. Starting with revisiting the concepts regarding MOSFETs and CMOS, students learn about CMOS circuits, logic implementation using CMOS, Logic design, Design Rules/Floor planning, Simple Layout Examples and RAM Cell Implementation. |
| PCCECE65L (B.Tech) | VLSI Design Lab | This Lab is designed to enable students to use simulators like ADS, Cadence, Mentor Graphics etc. for various operations like VI characteristics of a MOSFET, MOSFET as a Switch, linear resistor, transfer characteristics of CMOS Inverter, CMOS based basic (NOT, AND, OR) and universal gates (NAND, NOR), design and verify 2x1 multiplexer/ de-multiplexer using CMOS Logic, transmission gates, RAM Cell using CMOS cross coupled inverters, layout of CMOS based NOT, NAND and NOR gates. |
| PSIECE76 (B.Tech) | Project (Phase-I) | In the project work, the group of students shall choose a specific topic/area for the project. The selected areas shall encompass recent and emerging trends in technologies that prove beneficial for society in general and humanity in particular. |
| PCCECE82 (B.Tech) | Computer Network & Security | This course will provide the students with an expertise in the field of computer networks. The coursework includes Introduction to Networks, The Internet, Protocols And Standards, Various network models, switching, data transmission, Various network layers, Need for security and Network security protocols, Firewalls, VPNs etc. |
| BSCECE83 (B.Tech) | Organization of Engineering Systems & HR Management | This course will equip students with Organization and management skills. Topics like Understanding organizations: nature and functions, Concerns of organizing engineering business and systems, Structure and process issues in running organizations, Design issues in running organizations, Operating organizations, Effectiveness and performance, Cybernetics and systems framework, Man-machine relationship, recruitment, selection, skill formation and redeployment, Developing teams and leadership, Understanding motivation, Elements of human resources planning, Indian Industrial Law and managing industrial relations will be covered. |
| PCCECE82L (B.Tech) | Computer Network & Security Lab | In this Lab course students will get study different types of Network cables and practically implement them, Install and Configure - Wired and Wireless NIC and transfer files between systems in LAN and Wireless LAN, Network Devices: HUB, Switch and Routers, Host IP, Subnet Mask and Default Gateway in a System in LAN (TCP/IP Configuration), Peer to Peer network connection using two systems using Switch and Router in a LAN, use IPCONFIG, PING / Tracer, FTP Configuration etc. |
| PSIECE84 (B.Tech) | Project (Phase-II) | The students carry out remaining project work from 7th semester, if the students had done a mini project in 7th semester, they have to choose a new major project. Otherwise students who had completed Phase-I of their Project/Research project in 7th semester will complete the remaining part. |

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| PSIECE85 (B.Tech) | Professional Viva | The Professional Viva is conducted at the end of the 8th Semester. The students need to present themselves before an examination committee (Internal + External) with professional/Formal attire. The evaluation committee evaluates the students on the basis of subjective knowledge, technical abilities and soft skills. |
| PSIECE86 (B.Tech) | Industrial Internship | This training period is structured, short-term, supervised placements often focused around particular tasks or projects with defined timescales. An internship may be compensated, non-compensated or sometime may be paid. The internship <ul style="list-style-type: none"> Will expose Technical students to the industrial environment, which cannot be simulated in the classroom and hence creating competent professionals for the industry. Provide possible opportunities to learn, understand and sharpen the real time technical/managerial skills required at the job. Exposure to the current technological developments relevant to the subject area of training. Create conditions conducive to quest for knowledge and its applicability on the job. Learn to apply the Technical knowledge in real industrial situations. Gain experience in writing Technical reports/projects. |
| Departmental website link in support of New Courses introduced in the Programme since 2019. | | |
| https://iotece.uok.edu.in/Main/Default.aspx?active=lnk0 | | |
| Dates of syllabus revisions during the last five years. (2019-2023) | | |
| 2020-2021 (B.Tech) | | 2021(M.Tech) |
| Departmental website link in support of syllabus revisions | | |
| https://iotece.uok.edu.in/Main/Default.aspx?active=lnk0 | | |
| Are Programme Outcomes (POs) clearly mentioned in the syllabus? (Y/N) | | |
| yes | | |
| Are the Course Outcomes (COs) mentioned for each course of the programme? (Y/N) | | |
| yes | | |
| Does POs & COs have relevance to local, regional & global developmental needs? (Y/N) | | |
| Yes | | |
| List of courses addressing Local Needs: | | |
| Course Code | Course Title | Brief Justification |
| ELE20103 | Principles of Electrical Engineering | This course is designed to make students familiar with 1. The basic concepts and terminologies of Electrical circuits (AC and DC) and various laws governing the behaviour of voltage and current in simple and complex circuits. 2. Various electrical components, sources and their mathematical relations. 3. basic concepts and laws of magnetism produced in an electrical circuit. 4. Basics of Electrical machines (Transformers, Generators and motors) and Measurement devices (Ammeter, Voltmeter etc.) |
| CHM20104 | Environmental Science | This course will make students familiar with factors affecting Environment, the composition of Atmosphere, sources and effects of Air pollution, Global |
| ELE20103L | Principles of Electrical Engineering Lab | To introduce the use of measuring instruments (Voltmeter, Ammeter, Multi-meter, Oscilloscope, LCRQ meter) to verify various laws studied in theory and study the behaviour of basic electrical components. |
| MEC20107B | Workshop Practice B | Introduction to various machining and metal cutting processes and tools, different welding processes, tools and equipments, introduction to casting processes, familiarization of electrical and electronic tools and instrument, Safety precautions, processes, jobs, repair etc. |
| List of courses addressing Regional Needs: | | |
| Course Code | Course Title | Brief Justification |
| ELE20103 | Principles of Electrical Engineering | This course is designed to make students familiar with 1. The basic concepts and terminologies of Electrical circuits (AC and DC) and various laws governing the behaviour of voltage and current in simple and complex circuits. 2. Various electrical components, sources and their mathematical relations. 3. basic concepts and laws of magnetism produced in an electrical circuit. 4. Basics of Electrical machines (Transformers, Generators and motors) and Measurement devices (Ammeter, Voltmeter etc.) |
| ELE20103L | Principles of Electrical Engineering Lab | To introduce the use of measuring instruments (Voltmeter, Ammeter, Multi-meter, Oscilloscope, LCRQ meter) to verify various laws studied in theory and study the behaviour of basic electrical components. |
| PCCECE36L | EDA Tools Lab - I | This specially designed Lab course is designed to provide students hands-on experience on advanced Atmega microcontroller based prototyping board - Arduino and its programming for various scenarios and applications. |
| PCCECE46L | EDA Tools Lab - II | In continuation with the previous EDAT course, in this course students will work on MATLAB GUI Design and introduction Of Graphical User Interface, GUI Function Property, GUI Component Design, GUI Container, Writing the code of GUI Callback, Dialog Box, Menu Designing, applications, MATLAB SIMULINK, |
| PCCECE34L | Digital System Design Lab - I | This lab course is designed to give students a comprehensive knowledge of Digital circuits in IC packages. Students can make use of bread boards for implementing various gates, logic families, combinational and sequential circuits. |
| PCCMECE101 | Analog Integrated Circuit | This course will introduce advanced concepts in analog circuit design specifically relevant to CMOS IC design. It will cover circuit noise and mismatch, their analysis, and their impact on CMOS opamp design. At the end of this course, the student should be able to design and analyze several types of CMOS |
| List of courses addressing Global Needs: | | |
| Course Code | Course Title | Brief Justification |
| ESCECE35 | Data Structures | To equip students with basic knowledge of complex programming concepts, data structures like arrays, strings, linked lists, stacks, queues, hash tables, trees and techniques like sorting and searching. |
| ESCECE35L | Data Structures Lab | The Lab course will allow students to implement various data structures on a computer and carry out various operations like traversal, searching, sorting, Dijkstra's algorithm using priority queues. Prim's and Kruskal's algorithms. |
| ESCECE46 | OOPS with Java | This course is an introduction for an electronics engineer to the world of Object oriented programming. The student will learn about Tokens, Expressions, Control Structures, Inheritance & Packaging, Handling Error / Exceptions, Strings, Threads, I/O packages, applications and Database programming. |
| PCCECE51 | Information Theory and Coding | This course will give students knowledge of concepts regarding digital communication e.g. probability, random variable, process, channel coding theorems, Shannon's theorem, channel capacity, AWGN channel, error control codes. Advanced concepts like codes for 5G/6G, information theory for machine learning etc. |
| BSCECE83 | Organization of Engineering Systems & HR Management | This course will equip students with Organization and management skills. Topics like Understanding organizations: nature and functions, Concerns of organizing engineering business and systems, Structure and process issues in running organizations, Design issues in running organizations, Operating organizations, Effectiveness and performance, Cybernetics and systems framework, Man-machine relationship, recruitment, selection, skill formation and redeployment, Developing teams and leadership, Understanding motivation, Elements of human resources planning, Indian Industrial Law and managing industrial relations will be covered. |
| PCCECE82 | Computer Network & Security | In this Lab course students will get study different types of Network cables and practically implement them, Install and Configure - Wired and Wireless NIC and transfer files between systems in LAN and Wireless LAN, Network Devices: HUB, Switch and Routers, Host IP, Subnet Mask and Default Gateway in a System in LAN (TCP/IP Configuration), Peer to Peer network connection using two systems using Switch and Router in a LAN, use IPCONFIG, PING / Tracer, FTP Configuration etc. |
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| PCCECE44L | Signals and Systems Lab | This Lab course will give students an introduction to MATLAB programs on basic and logical operations on matrices, function files, signals and sequences, generation of even & odd components of a signal, convolution of continuous time signals & discrete time sequences, Auto correlation and Cross correlation, Gibbs phenomenon, Fourier analysis and properties, Plot magnitude and Phase response of a given system, Inverse Fourier transform, Laplace transform and it's Inverse, Discrete time Fourier transform and it's Inverse, Z-transform and its Inverse. |
| Does the Programme offer focus on Employability/ Entrepreneurship/ Skill development courses? (Y/N) | | Y |
| List of Employability Courses: | | |
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| ECE20203 | Fundamentals of Electronic Engineering | This course will give students an understanding of electronics and applications of electronic systems in real life. It will also enable students to understand basic concepts and terminologies regarding semiconductor materials. Students will acquire theoretical knowledge about various diodes, transistors and electronic measurement devices. Basic concepts of digital electronics and other devices like microprocessors and microcontrollers. |
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| PSIECE86 | Industrial Internship | This training period is structured, short-term, supervised placements often focused around particular tasks or projects with defined timescales. An internship may be compensated, non-compensated or sometime may be paid. The internship • Will expose Technical students to the industrial environment, which cannot be simulated in the classroom and hence creating competent professionals for the industry. |
| PCCMECE101 | Analog Integrated Circuit Design | This course will introduce advanced concepts in analog circuit design specifically relevant to CMOS IC design. It will cover circuit noise and mismatch, their analysis, and their impact on CMOS opamp design. At the end of this course, the student should be able to design and analyze several types of CMOS opamps at the transistor level |
| PSIECE84 | Project (Phase-II) | The students carry out remaining project work from 7th semester, if the students had done a mini project in 7th semester, they have to choose a new major project. Otherwise students who had completed Phase-I of their Project/Research project in 7th semester will complete the remaining part. |
| PEC3MECE3XX | Deep learning (Professional Elective Course-III) | The main objective of this course is to make students comfortable with tools and techniques required in handling large amounts of datasets. They will also uncover various deep learning methods in NLP, Neural Networks etc. Several libraries and datasets publicly available will be used to illustrate the application of these algorithms. This will help students in developing skills required to gain experience of doing independent research and study. |
| CSE20204L | Computer Programming with C Lab | In this Lab students will work on their programming skills by creating Algorithms and programs for various tasks. Understand basics of C and its usefulness in carrying out various tasks. |
| PCCMECE102L | Advanced DSP Lab | Students would be able to simulate various signal processing algorithms and related applications like Sampling, discretization and reconstruction of signals, Digital signal generation, Image processing, Audio processing, Transform based compression, Filtering of noise, separation of signals etc. . |
| PEC2MECE2XXL | Network security and cryptography Lab (Professional Elective) | The main objectives of this course are: to Learn the fundamentals of network coding theory, Understand the performance parameters required for network coding, Gain the knowledge of the network coding design methods, Learn different approaches for the network coding, Understand error correction and detection methods of adversarial errors. |
| PCCMECE202L | Modern Wireless Communication Systems Lab | The main objectives of the course are: Get familiar with the future wireless communication systems and concepts, Learn Signal and waveform design for communication and radar jointly, Learn how to design and transmit signals for communication and sensing purposes. |
| PEC4MECE3XXL | Antenna Design lab (Professional Elective Course Lab IV) | Through this course Students will be able to understand the fundamental working principle of an antenna, To describe/explore the different antenna parameters like input impedance, far-field radiation patterns, reflection coefficient, etc, To apply the different feeding technique, To evaluate and perform the optimization to achieve a certain goal, To design the wire antennas, microstrip antennas, dielectric resonator antenna, to learn Smart Antennas, learn antenna Synthesis etc |
| List of Entrepreneurship Development Courses: | | |
| Course Code | Course Title | Brief Justification |
| PCCECE34L | Digital System Design Lab - I | This lab course is designed to give students a comprehensive knowledge of Digital circuits in IC packages. Students can make use of bread boards for implementing various gates, logic families, combinational and sequential circuits. |
| PCCECE36L | EDA Tools Lab - I, II and III | This specially designed Lab course is designed to provide students hands-on experience on advanced Atmega microcontroller based prototyping board - Arduino and its programming for various scenarios and applications. In continuation with the previous EDAT course, in this course students will work on MATLAB GUI Design and introduction Of Graphical User Interface, GUI Function Property, GUI Component Design, GUI Container, Writing the code of GUI Callback, Dialog Box, Menu Designing, applications, MATLAB SIMULINK, Image Processing with MATLAB, Symbolic Math in MATLAB. The students will also get an introduction to PCB design, process and flow. Introduction to PCB Fabrication & Assembly |
| ESCECE46 | OOPS with Java | This course is an introduction for an electronics engineer to the world of Object oriented programming. The student will learn about Tokens, Expressions, Control Structures, Inheritance & Packaging, Handling Error / Exceptions, Strings, Threads, I/O packages, applications and Database programming. |
| PCCECE65L | VLSI Design Lab | This Lab is designed to enable students to use simulators like ADS, Cadence, Mentor Graphics etc. for various operations like VI characteristics of a MOSFET, MOSFET as a Switch, linear resistor, transfer characteristics of CMOS Inverter, CMOS based basic (NOT, AND, OR) and universal gates (NAND, NOR), design and verify 2x1 multiplexer/ de-multiplexer using CMOS Logic, transmission gates, RAM Cell using CMOS cross coupled inverters, layout of CMOS |
| PCCECE82L | Computer Network & Security Lab | In this Lab course students will get study different types of Network cables and practically implement them, Install and Configure - Wired and Wireless NIC and transfer files between systems in LAN and Wireless LAN, Network Devices: HUB, Switch and Routers, Host IP, Subnet Mask and Default Gateway in a System in LAN (TCP/IP Configuration), Peer to Peer network connection using two systems using Switch and Router in a LAN, use IPCONFIG, PING / Tracer, FTP Configuration etc |
| PSIECE84 | Project (Phase-I and II) | In the project work, the group of students shall choose a specific topic/area for the project. The selected areas shall encompass recent and emerging trends in technologies that prove beneficial for society in general and humanity in particular. The students carry out remaining project work from 7th semester, if the students had done a mini project in 7th semester, they have to choose a new major project. Otherwise students who had completed Phase-I of their Project/Research project in 7th semester will complete the remaining part. |
| BSCECE83 | Organization of Engineering Systems & HR Management | This course will equip students with Organization and management skills. Topics like Understanding organizations: nature and functions, Concerns of organizing engineering business and systems, Structure and process issues in running organizations, Design issues in running organizations, Operating organizations, Effectiveness and performance, Cybernetics and systems framework, Man-machine relationship, recruitment, selection, skill formation and redeployment, Developing teams and leadership, Understanding motivation, Elements of human resources planning, Indian Industrial Law and managing industrial relations will be covered. |

| | | |
|--------------|--|---|
| OECMECE3XXL | Coding Techniques Lab (Open Elective Course Lab-I) | This course introduces computer programming using the Python programming language and R language . Emphasis is placed on common algorithms and programming principles utilizing the standard library distributed with Python. Upon completion, students should be able to design, code, test, and debug Python language program. Students will learn Manipulate primitive data types in the R programming language, Construct and manipulate R data structures, including vectors, factors, lists, and data frame, Control program flow with conditions and loops, write functions, perform character string operations, write regular expressions, handle errors.Read, write, and save data files using R. |
| PEC3MECE3XX | Deep learning (Professional Elective Course-II) | The main objective of this course is to make students comfortable with tools and techniques required in handling large amounts of datasets. They will also uncover various deep learning methods in NLP, Neural Networks etc. Several libraries and datasets publicly available will be used to illustrate the application of these algorithms. This will help students in developing skills required to gain experience of doing independent research and study. |
| CSE20204L | Computer Programming with C Lab | In this Lab students will work on their programming skills by creating Algorithms and programs for various tasks. Understand basics of C and its usefulness in carrying out various tasks. |
| PCCMECE102L | Advanced DSP Lab | Students would be able to simulate various signal processing algorithms and related applications like Sampling, discretization and reconstruction of signals, Digital signal generation, Image processing, Audio processing, Transform based compression, Filtering of noise, separation of signals etc. . |
| PEC4MECE3XXL | Antenna Design lab (Professional Elective Course Lab IV) | Through this course Students will be able to understand the fundamental working principle of an antenna, To describe/explore the different antenna parameters like input impedance, far-field radiation patterns, reflection coefficient, etc, To apply the different feeding technique, To evaluate and perform the optimization to achieve a certain goal, To design the wire antennas, microstrip antennas, dielectric resonator antenna,to learn Samrt Antennas, learn antenna Synthesis etc |

List of Skill development Courses:

| Course Code | Course Title | Brief Justification |
|----------------------|--|---|
| PCCECE36L | EDA Tools Lab - I, II and III | This specially designed Lab course is designed to provide students hands-on experience on advanced Atmega microcontroller based prototyping board - Arduino and its programming for various scenarios and applications.In continuation with the previous EDAT course, in this course students will work on MATLAB GUI Design and introduction Of Graphical User Interface, GUI Function Property, GUI Component Design, GUI Container, Writing the code of GUI Callback, Dialog Box, Menu Designing, applications, MATLAB SIMULINK, Image Processing with MATLAB, Symbolic Math in MATLAB. The students will also get an introduction to PCB design, process and flow. Introduction to PCB Fabrication & Assembly |
| PSIECE86 | Industrial Internship | This training period is structured, short-term, supervised placements often focused around particular tasks or projects with defined timescales. An internship may be compensated, non-compensated or sometime may be paid. The internship <ul style="list-style-type: none"> • Will expose Technical students to the industrial environment, which cannot be simulated in the classroom and hence creating competent professionals for the industry. • Provide possible opportunities to learn, understand and sharpen the real time technical/managerial skills required at the job. • Exposure to the current technological developments relevant to the subject area of training. • Create conditions conducive to quest for knowledge and its applicability on the job. • Learn to apply the Technical knowledge in real industrial situations. • Gain experience in writing Technical reports/projects. • Expose students to the engineer's responsibilities and ethics. |
| MEC20107B | Workshop Practice B | Introduction to various machining and metal cutting processes and tools, different welding processes, tools and equipments, introduction to casting processes, familiarization of electrical and electronic tools and instrument, Safety precautions, processes, jobs, repair etc. |
| PCCMECE103L (M.Tech) | Advanced Computation & Simulation Tools | in this course a student will learn three different skill development tools, ORCAD (Students will learn to circuit level designing, simulation etc). MATLAB(IN THIS TOOL STUDENTS WILL LEARN TO CREATE DIFFERENT SYSTEMS on discrete level. they will learn GUI designing, designing on Simulink which works on Block level, matlab Programming, Image processing, etc) and PYTHON(The goal of the course is to introduce students to Python Vx programming using hands on instruction.The approach will be to present an example followed by a small exercise where the learner tries something similar to solidify a |
| PCCECE65L | VLSI Design Lab | This Lab is designed to enable students to use simulators like ADS, Cadence, Mentor Graphics etc. for various operations like VI characteristics of a MOSFET, MOSFET as a Switch, linear resistor, transfer characteristics of CMOS Inverter, CMOS based basic(NOT,AND,OR) and universal gates(NAND, NOR), design and verify 2x1 multiplexer/ de-multiplexer using CMOS Logic, transmission gates, RAM Cell using CMOS cross coupled inverters, layout of CMOS based NOT, NAND and NOR gates. |
| ESCECE35L | Data Structures Lab | The Lab course will allow students to implement various data structures on a computer and carry out various operations like traversal, searching, sorting, Dijkstra's algorithm using priority queues. Prim's and Kruskal's algorithms. |
| PECECE1XXL | Digital image Processing Lab(Professional Elective | To introduce the concepts of image processing and basic analytical methods to be used in image processing. To familiarize students with image enhancement and restoration techniques, To explain different image compression techniques. To introduce segmentation and morphological processing |
| PCCECE43L | Digital System Design Lab - II | This Lab course will give students opportunity to design various digital circuits (Logic gates, Sequential and combinational) using VHDL and Implementation using Xilinx/Spartan Kits. |
| OECMECE3XXL | Coding Techniques Lab (Open Elective Course Lab-I) | This course introduces computer programming using the Python programming language and R language . Emphasis is placed on common algorithms and programming principles utilizing the standard library distributed with Python. Upon completion, students should be able to design, code, test, and debug Python language program. Students will learn Manipulate primitive data types in the R programming language, Construct and manipulate R data structures, including vectors, factors, lists, and data frame, Control program flow with conditions and loops, write functions, perform character string operations, write regular expressions, handle errors.Read, write, and save data files using R |
| PEC3MECE3XX | Deep learning (Profession | The main objective of this course is to make students comfortable with tools and techniques required in handling large amounts of datasets. They will also uncover various deep learning methods in NLP, Neural Networks etc. Several libraries and datasets publicly available will be used to illustrate the |
| CSE20204L | Computer Programming with C Lab | In this Lab students will work on their programming skills by creating Algorithms and programs for various tasks. Understand basics of C and its usefulness in carrying out various tasks. |
| PCCMECE202L | Modern Wireless Communication Systems Lab | The main objectives of the course are: Get familiar with the future wireless communication systems and concepts,Learn Signal and waveform design for communication and radar jointly, Learn how to design and transmit signals for communication and sensing purposes. |
| PEC4MECE3XXL | Antenna Design lab (Professional Elective Course Lab IV) | Through this course Students will be able to understand the fundamental working principle of an antenna, To describe/explore the different antenna parameters like input impedance, far-field radiation patterns, reflection coefficient, etc, To apply the different feeding technique, To evaluate and perform the optimization to achieve a certain goal, To design the wire antennas, microstrip antennas, dielectric resonator antenna,to learn Samrt Antennas, learn antenna Synthesis etc |
| PCCECE44L | Signals and Systems Lab | This Lab course will give students an introduction to MATLAB programs on basic and logical operations on matrices, function files, signals and sequences, generation of even & odd components of a signal, convolution of continuous time signals & discrete time sequences, Auto correlation and Cross correlation, Gibbs phenomenon, Fourier analysis and properties, Plot magnitude and Phase response of a given system, Inverse Fourier transform, Laplace transform and it's Inverse, Discrete time Fourier transform and it's Inverse, Z-transform and its Inverse. |

Does the programme have courses addressing Professional ethics/ gender/ human values/ environment/ sustainability & other value framework enshrined in NEP2020/etc. (Y/N) Y

List of courses addressing Professional Ethics:

| Course Code | Course Title | Brief Justification |
|-------------|---|--|
| PCCMECE104 | Research Methodology & Language | This has been introduced so that at the end of this course, the students should be able to: understand some basic concepts of research and its methodologies , identify appropriate research topics ,select and define appropriate research problem and parameters ,prepare a project proposal (to undertake a project) ,organize and conduct research (advanced project) in a more appropriate manner ,write a research report and thesis ,write a research proposal (grants) |
| PSIECE85 | Professional Viva | The Professional Viva is conducted at the end of the 8th Semester. The students need to present themselves before an examination committee (Internal + External) with professional/Formal attire. The evaluation committee evaluates the students on the basis of subjective knowledge,technical abilities and |
| BSCCECE83 | Organization of Engineering Systems & HR Management | This course will equip students with Organization and management skills. Topics like Understanding organizations: nature and functions, Concerns of organizing engineering business and systems, Structure and process issues in running organizations, Design issues in running organizations, Operating organizations ,Effectiveness and performance, Cybernetics and systems framework, Man-machine relationship, recruitment, selection, skill formation and redeployment, Developing teams and leadership, Understanding motivation, Elements of human resources planning, Indian Industrial Law and managing industrial relations will be covered. |

List of courses addressing Gender Issues:

| Course Code | Course Title | Brief Justification |
|-------------|--------------|---------------------|
| | | |

List of courses addressing Human Value Issues:

| Course Code | Course Title | Brief Justification |
|-------------|--------------|---------------------|
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|--|--|---|----------------------------|-------------------------|---|--|---|---|
| BSCCECE83 | Organization of Engineering Systems & HR Management | This course will equip students with Organization and management skills. Topics like Understanding organizations: nature and functions, Concerns of organizing engineering business and systems, Structure and process issues in running organizations, Design issues in running organizations, Operating organizations ,Effectiveness and performance, Cybernetics and systems framework, Man-machine relationship, recruitment, selection, skill formation and redeployment, Developing teams and leadership, Understanding motivation, Elements of human resources planning, Indian Industrial Law and managing industrial relations will be covered. | | | | | | |
| List of courses addressing Environment Issues: | | | | | | | | |
| Course Code | Course Title | Brief Justification | | | | | | |
| CHM20104 | Environmental Science | This course will make students familiar with factors affecting Environment, the composition of Atmosphere, sources and effects of Air pollution, Global warming and its causes and impacts, climate change, acid rain, ozone layer depletion, hydrosphere, causes and effects of water pollution,Conservation and treatment of water, Sustainable Development and various Social and economic issues. | | | | | | |
| List of courses addressing Sustainability issues: | | | | | | | | |
| Course Code | Course Title | Brief Justification | | | | | | |
| PCCECE36L | EDA Tools Lab - I, II and III | This specially designed Lab course is designed to provide students hands-on experience on advanced Atmega microcontroller based prototyping board - Arduino and its programming for various scenarios and applications.In continuation with the previous EDAT course, in this course students will work on MATLAB GUI Design and introduction Of Graphical User Interface, GUI Function Property, GUI Component Design, GUI Container, Writing the code of GUI Callback, Dialog Box, Menu Designing, applications, MATLAB SIMULINK, Image Processing with MATLAB, Symbolic Math in MATLAB. The students will also get an introduction to PCB design, process and flow. Introduction to PCB Fabrication & Assembly | | | | | | |
| PCCMECE103L (M.Tech) | Advanced Computation & Simulation Tools | in this course a student will learn three different skill development tools, ORCAD (Students will learn to circuit level designing, simulation etc). MATLAB(IN THIS TOOL STUDENTS WILL LEARN TO CREATE DIFFERENT SYSTEMS on discrete level. they will learn GUI designing, designing on Simulink which works on Block level, matlab Programming, Image processing, etc) and PYTHON(The goal of the course is to introduce students to Python Vx programming using hands on instruction.The approach will be to present an example followed by a small exercise where the learner tries something similar to solidify a | | | | | | |
| OECMECE3XXL | Coding Techniques Lab (Open Elective Course Lab-I) | This course introduces computer programming using the Python programming language and R language . Emphasis is placed on common algorithms and programming principles utilizing the standard library distributed with Python. Upon completion, students should be able to design, code, test, and debug Python language program. Students will learn Manipulate primitive data types in the R programming language, Construct and manipulate R data structures, including vectors, factors, lists, and data frame, Control program flow with conditions and loops, write functions, perform character string operations, write regular expressions, handle errors.Read, write, and save data files using R. | | | | | | |
| PEC3MECE3XX | Deep learning (Profession) | The main objective of this course is to make students comfortable with tools and techniques required in handling large amounts of datasets. They will also uncover various deep learning methods in NLP, Neural Networks etc. Several libraries and datasets publicly available will be used to illustrate the application of these algorithms. This will help students in developing skills required to gain experience of doing independent research and study. | | | | | | |
| List of courses addressing Other Value Framework enshrined in NEP2020/etc.: | | | | | | | | |
| Course Code | Course Title | Brief Justification | | | | | | |
| | | | | | | | | |
| Does the Department/Directorate/Institute/ Centre offer Diploma Programme? (Y/N) | | | | | | | | no |
| Details of the Diploma Programmes offered by the institutions where the students of the institution have enrolled and successfully completed during the last five years (2019-2023) | | | | | | | | |
| Programme Code | Name of Diploma Programme | Mode of Programme (Online/Offline) | Year of Offering/enrolment | Contact hours of course | Number of students enrolled in the year | Number of Students completing the | Departmental website link to the | Number of students enrolled in the year |
| | | | | | | | | |
| Does the Department/Directorate/Institute/ Centre offer Certificate Courses? (Y/N) | | | | | | | | No |
| Details of the Certificate Courses offered by the institutions where the students of the institution have enrolled and successfully completed during the last five years (2019-2023) | | | | | | | | |
| Course Code | Name of Certificate Course | Mode of Course (Online/Offline) | Year of Offering/enrolment | Contact hours of course | Number of students enrolled in the year | Number of Students completing the | Departmental website link to the | Number of students enrolled in the year |
| | | | | | | | | |
| Does the Department/Directorate/Institute/ Centre offer Value-Added Courses? (Y/N) | | | | | | | | No |
| Details of the Value Added Courses offered by the institutions where the students of the institution have enrolled and successfully completed during the last five years (2019-2023) | | | | | | | | |
| Course Code | Name of Value-Added Course | Mode of Course (Online/Offline) | Year of Offering/enrolment | Contact hours of course | Number of students enrolled in the year | Number of Students completing the | Departmental website link to the | Number of students enrolled in the year |
| | | | | | | | | |
| Does the Department/Directorate/Institute/ Centre offer Online Courses of MOOCs, SWAYAM/e-PG Pathshala/ NPTEL and other recognized platforms? (Y/N) | | | | | | | | N |
| Details of Online Courses of MOOCs, SWAYAM/e-PG Pathshala/ NPTEL and other recognized platforms where the students of the institution have enrolled and successfully completed during the last five years (2019-2023) | | | | | | | | |
| Course Code | Name of the Course | Mode of the Course-offered by the HEI or Online (Specify the platform like MOOC, SWAYAM) | Year of Offering/enrolment | Contact hours of course | Number of students enrolled in the year | Number of Students completing the course in the year | Departmental website link to the relevant document | Number of students enrolled in the year |
| | | | | | | | | |
| Does the programme have Field Projects/ Research Projects /Internship in the programme? (Y/N) | | | | | | | | yes |
| Details of components of Field Projects / Research Projects / Internships implemented during last five years (2019-2023) | | | | | | | | |
| Course Code | Name of the course pertaining to field projects/ Research Projects /Internship | Number of Credits | | | Number of students undertaking course | | Departmental website link to the relevant document | |
| PCCMECE314 (M.Tech) | Project Phase-I | 5 | | | 6 | | https://iotece.uok.edu.in/Main/Default.aspx | |
| PCCMECE401 (M.Tech) | Phase - II Dissertation | 15 | | | 6 | | https://iotece.uok.edu.in/Main/Default.aspx | |
| PSIECE66 | Seminar | 1 | | | 56 | | | |
| PSIECE76 | Project (Phase-I) | 1 | | | - | | | |
| PSIECE84 | Project (Phase-II) | 4 | | | - | | | |
| PSIECE85 | Professional Viva | 1 | | | - | | | |
| PSIECE86 | Industrial Internship | 1 | | | - | | | |

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|-----------|--|---|-----|--|--|
| ECE 7517B | Seminar & Pre Project | 1 | 200 | | |
| ECE 8317B | Project | 8 | 200 | | |
| ECE 8417B | Practical training Viva/ Professional Viva | 4 | 200 | | |
| ECE 7517 | Seminar & Pre Project | 1 | 130 | | |
| ECE 8217 | Project | 7 | 130 | | |
| ECE 8317 | Practical training Viva/ Professional Viva | 4 | 130 | | |

Sd/-
Abdul Mueed Hafiz

Signature of the Head/Director of the Department/Centre/Institute

General Instructions:

1. Kindly format the syllabus in light of the instruction and discussions held in past meetings and upload the syllabus on the Departmental Website.
2. Upload valid proofs on the Departmental Website.