



Excellence in Higher Education

AKSHAYA

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, Recognized by UGC and Affiliated to Anna University)

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Kinathukadavu, Coimbatore-642109. www.acetcbe.edu.in

AN AUTONOMOUS INSTITUTION



DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES (REGULATION 2021)

SEMESTER III

Course Code / Course Name: MA3355 / Random Processes and Linear Algebra

| CO No. | Course Outcomes (COs) |
|--------|--|
| C201.1 | Understand the fundamentals of probability and standard distributions used in engineering applications. |
| C201.2 | Understand the basic concepts of one and two dimensional random variables in the context of real-world engineering problems. |
| C201.3 | Apply the concept of random process in engineering disciplines |
| C201.4 | Apply vector space concepts to analyze and solve linear systems in various engineering scenarios. |
| C201.5 | Apply linear transformations, inner product spaces, and orthogonalization techniques to analyze engineering problems. |

Course Code / Course Name: CS3353 / C Programming and Data Structures

| CO No. | Course Outcomes (COs) |
|--------|--|
| C202.1 | Demonstrate proficiency in C programming fundamentals, including data types, variables, expressions, conditional statements, functions, recursion, and arrays. |
| C202.2 | Apply advanced C programming features such as structures, unions, enumerated data types, pointers, file handling, and preprocessor directives to solve complex problems. |
| C202.3 | Implement linear data structures such as lists, stacks, queues, and priority queues in various applications. |
| C202.4 | Design non-linear data structures like binary trees, expression trees, and hashing techniques with appropriate collision resolution methods. |
| C202.5 | Utilize sorting and searching algorithms to efficiently process large data sets, ensuring optimal performance in tasks such as data organization and retrieval. |

Course Code / Course Name: EC3354 / Signals and Systems

| CO No. | Course Outcomes (COs) |
|--------|--|
| C203.1 | Classify the types of signals & systems |
| C203.2 | Apply Fourier series, Fourier transform and Laplace Transforms for continuous time signals |

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|--------|---|
| C203.3 | Interpret Linear Time Invariant Continuous time system using Transforms |
| C203.4 | Apply DTFT and Z transform for Discrete time signals |
| C203.5 | Interpret Linear Time Invariant Discrete time system using Transforms |

Course Code / Course Name: EC3353 / Electronic Devices and Circuits

| CO No. | Course Outcomes (COs) |
|--------|--|
| C204.1 | Identify the structure, operation, and characteristics of semiconductor devices such as PN junction diodes, Zener diodes, BJTs, MOSFETs, and UJTs, including rectifiers and their applications. |
| C204.2 | Explain the concepts of amplifiers by discussing the load line, operating point, biasing methods, small-signal models of BJTs and MOSFETs, and evaluating gain and frequency response for various amplifier configurations. |
| C204.3 | Discuss the functioning of multistage amplifiers and differential amplifiers, including cascode amplifiers, and describe their performance in common-mode and difference-mode configurations |
| C204.4 | Understand the advantages of negative feedback, different types of feedback amplifiers, and the conditions for oscillations in various oscillator designs. |
| C204.5 | Explain the operation of power amplifiers and DC/DC converters, including Class A, B, AB, C amplifiers, and MOSFET power amplifiers, along with the analysis and working principles of Buck, Boost, and Buck-Boost converters. |

Course Code / Course Name: EC3351 / Control Systems

| CO No. | Course Outcomes (COs) |
|--------|--|
| C205.1 | Identify the components and basic structure of control systems, including feedforward and feedback control, transfer function models, block diagrams, signal flow graphs, and different types of control systems like DC and AC servo systems. |
| C205.2 | Analyze the time response of control systems, including transient and steady-state responses, performance measures for first and second-order systems, and the effect of additional zeros and poles on system performance. |
| C205.3 | Examine the frequency response of control systems, using Bode, Polar, and Nyquist plots to evaluate system performance, and design compensators using cascade lead, lag, and lag-lead compensation. |
| C205.4 | Evaluate the stability of control systems using various criteria such as Routh-Hurwitz, root locus, and Nyquist, and understand concepts like bounded-input bounded-output stability and relative stability. |
| C205.5 | Apply state variable methods to represent, analyze, and solve control systems, including converting between state variable models and transfer functions, analyzing controllability and observability, and designing digital control systems using state feedback. |

Course Code / Course Name: GE3361 / Professional Development

| CO No. | Course Outcomes (COs) |
|--------|--|
| C209.1 | Create well-structured and formatted documents using MS Word for academic and technical purposes. |
| C209.2 | Apply advanced formatting tools in MS Word to organize content using tables, styles, headers/footers, and references. |
| C209.3 | Use MS Excel to perform data entry, manipulation, and basic calculations using formulas and functions. |
| C209.4 | Analyze and visualize data in MS Excel using charts, graphs, pivot tables, and conditional formatting for effective decision-making. |
| C209.5 | Design engaging academic presentations using MS PowerPoint by integrating tables, charts, media, and hyperlinks |

SEMESTER IV

Course Code / Course Name: EC3452 / Electromagnetic Fields

| CO No. | Course Outcomes (COs) |
|--------|---|
| C210.1 | Relate the fundamentals of vector, coordinate system to electromagnetic concepts |
| C210.2 | Analyze electrostatic fields and potentials using fundamental laws to solve boundary value problems involving conductors, dielectrics, and capacitance. |
| C210.3 | Interpret magnetostatic fields, forces, and energy for various current distributions and magnetic materials using governing laws and circuit concepts. |
| C210.4 | Explain the concepts and characteristics of Magneto Static field in material space and solve boundary conditions. |
| C210.5 | Analyze plane electromagnetic wave propagation, power flow, and boundary interactions in lossless and lossy media. |

Course Code / Course Name: EC3401 / Networks and Security

| CO No. | Course Outcomes (COs) |
|--------|---|
| C211.1 | Grasp the core principles of network models(OSI,TCP/IP) and data link layer functionalities,focusing on addressing and error management for foundational network insights |
| C211.2 | Develop Proficiency in network layer protocols,mastering IPv4/IPv6 addressing and routing, while smoothly transitioning from IPv4 and IPv6 technologies. |
| C211.3 | Understand transport and application layer protocols.emphasizing UDP,TCP,Congestion control,Client-server architecture and key protocols like HTTP and DNS. |
| C211.4 | Acquire a deep understanding of network security by exploring encryption techniques,understanding both symmetric and asymmetric algorithms like AES and RSA.and learning to identify and counteract various cyber security threats. |
| C211.5 | Explore the realms of hardware security,including hardware Trojans and side-channel attacks,and gain an introductory understanding of block chain technology. |

Course Code / Course Name: EC3352 / Digital Systems Design

| CO No. | Course Outcomes (COs) |
|--------|---|
| C206.1 | Apply Boolean algebraic Principles and Simplification methodologies pertinent to digital logic circuits for optimizing design efficiency. |
| C206.2 | Create diverse combinational digital circuits employing a variety of logic gates |
| C206.3 | Examine and develop synchronous sequential circuits through analysis and design methodologies. |
| C206.4 | Investigate and construct asynchronous sequential circuits through analysis and precise design techniques. |
| C206.5 | Construct logic gates and utilize programmable devices for practical applications in digital circuits. |

Course Code / Course Name: EC3361 / Electronic Devices and Circuits Laboratory

| CO No. | Course Outcomes (COs) |
|--------|---|
| C207.1 | Analyse the forward and reverse bias behaviours of PN junction diodes and the voltage |
| C207.2 | Evaluating the distortion characteristics of BJT and MOSFET amplifiers under different operating conditions |
| C207.3 | Analyse the frequency response of common emitter, common source and common collector amplifiers. |
| C207.4 | Design and analyse the frequency response of differential amplifiers, class A amplifier and cascade amplifiers. |
| C207.5 | Understand the principle and operation of full wave rectifiers and measurement of CMMR. |

Course Code / Course Name: CS3362 / C Programming and Data Structures Laboratory

| CO No. | Course Outcomes (COs) |
|--------|--|
| C208.1 | Utilize various constructs of C programming, such as data types, control structures, functions, and arrays, to design and develop applications for solving real-world or technical problems effectively. |
| C208.2 | Write functions to implement a wide range of operations on linear and nonlinear data structures, such as linked lists, stacks, queues, trees, and graphs, while ensuring efficient handling of data. |
| C208.3 | Apply suitable linear and non-linear data structure operations, such as insertion, deletion, searching, and traversal, to effectively solve complex problems in real world scenarios. |
| C208.4 | Implement appropriate hash functions to ensure efficient data storage and retrieval, focusing on minimizing collisions and optimizing lookup times in large data sets. |
| C208.5 | Execute various sorting and searching algorithms, including Quick Sort, Merge Sort, and Binary Search, to efficiently handle and organize data for specific applications, ensuring optimal performance. |

Course Code / Course Name: GE3451 / Environmental Sciences and Sustainability

| CO No. | Course Outcomes (COs) |
|--------|---|
| C215.1 | Understand the concept of environment and bio diversity, duty of individuals in conservation of environment and bio diversity. |
| C215.2 | Describe environmental pollution, its causes, effects and control, management of natural disasters. |
| C215.3 | Understand energy management and conservation and also the importance of different sources of energy. |
| C215.4 | Understand the sustainability and management process and assess climate changes, concept of carbon credit and the challenges of environmental management. |
| C215.5 | Evaluate the role of sustainable urbanization, green materials, energy cycles, the rules and regulation of Sustainability practices |

Course Code / Course Name: EC3461 / Communication Systems Laboratory

| CO No. | Course Outcomes (COs) |
|--------|--|
| C216.1 | Design AM, FM, and digital modulators tailored to specific applications, considering the advantages and limitations of each modulation technique for effective signal transmission. |
| C216.2 | Calculate the sampling frequency for digital modulation, ensuring accurate representation of analog signals in digital form while minimizing aliasing and distortion. |
| C216.3 | Simulate and validate various functional modules of a communication system, ensuring that each component performs according to its design specifications in a simulated environment. |
| C216.4 | Demonstrate knowledge of baseband signaling schemes by implementing and analyzing digital modulation schemes, understanding their application in real world communication systems. |
| C216.5 | Apply various channel coding schemes to enhance the noise performance of communication systems, demonstrating the impact of coding on error correction and system reliability |

Course Code / Course Name: EC3462 / Linear integrated circuits Laboratory

| CO No. | Course Outcomes (COs) |
|--------|--|
| C217.1 | Evaluate various types of feedback amplifiers, comparing their performance, characteristics, and suitability for different applications in electronic systems. |
| C217.2 | Calculate the sampling frequency for digital modulation, ensuring accurate representation of analog signals in digital form while minimizing aliasing and distortion |
| C217.3 | Simulate and verify the functionality of feedback amplifiers, oscillators, tuned amplifiers, wave-shaping circuits, multivibrators, and filters using SPICE tools to ensure correct operation in virtual environments. |
| C217.4 | Develop amplifiers, oscillators, and D-A converters using operational amplifiers, ensuring effective signal processing and conversion with consideration of stability and bandwidth. |
| C217.5 | Analyze filters designed with operational amplifiers, and perform experiments to assess their frequency response, confirming their performance and compliance with design specifications. |

Course Code / Course Name: EC3451 / Linear Integrated Circuits

| CO No. | Course Outcomes (COs) |
|--------|---|
| C212.1 | Able to analyze and design current sources, differential amplifiers, and BJT/MOSFET operational amplifiers, and evaluate their internal structures and performance characteristics |
| C212.2 | Design linear and nonlinear applications of operational amplifiers including amplifiers, integrators, differentiators, and filters |
| C212.3 | Design practical applications using analog multipliers and Phase-Locked Loops for modulation, demodulation, and frequency synthesis |
| C212.4 | Design and analyze ADC and DAC circuits using operational amplifiers and understand data conversion specifications |
| C212.5 | Generate various waveforms using operational amplifier circuits including sine-wave, triangular, and sawtooth generators Analyze special function ICs (Timer 555, Voltage Regulators, Function Generators) and their applications in electronic circuits. |

Course Code / Course Name: EC3492 / Digital Signal Processing

| CO No. | Course Outcomes (COs) |
|--------|--|
| C213.1 | Apply the Discrete Fourier Transform (DFT) to analyze discrete signals and systems, identifying frequency components and examining signal properties in the frequency domain. |
| C213.2 | Design IIR (Infinite Impulse Response) and FIR (Finite Impulse Response) filters, selecting appropriate filter structures and coefficients to meet specific signal processing requirements |
| C213.3 | Characterize the effects of finite precision representation on digital filters, analysing how quantization errors, rounding, and other factors impact filter performance and stability. |
| C213.4 | Design multirate filters, understanding and implementing techniques for processing signals at different sampling rates to improve efficiency and performance in communication systems |
| C213.5 | Apply adaptive filters in communication systems, utilizing their ability to adjust filter parameters dynamically for improved signal processing, noise reduction, and system optimization. |

Course Code / Course Name: EC3491 / Communication Systems

| CO No. | Course Outcomes (COs) |
|--------|---|
| C214.1 | Understand amplitude modulation techniques, including their principles, types, and applications in communication systems for effective signal transmission. |
| C214.2 | Apply the concepts of random processes in the design of communication systems, analyzing how noise and uncertainty impact signal transmission and system performance |
| C214.3 | Acquire knowledge in digital techniques, digital signal processing, modulation, and transmission methods for modern communication systems |
| C214.4 | Explore the principles of sampling and quantization, understanding their role in converting continuous signals into discrete forms for digital processing and transmission. |
| C214.5 | Comprehend the importance of demodulation techniques, role in extracting the original information from modulated signals in various communication systems. |

SEMESTER V

Course Code / Course Name: EC3501 / Wireless Communication

| CO No. | Course Outcomes (COs) |
|---------------|---|
| C301.1 | Explore and comprehend the principles and design of a cellular system. |
| C301.2 | Examine and understand mobile radio propagation and various Digital Modulation Techniques |
| C301.3 | Explore the principles of multiple access techniques and wireless networks. |
| C301.4 | Describe the wireless channel and emerge the system design specifications. |
| C301.5 | Construct a cellular system based on resource availability and traffic demands. |

Course Code / Course Name: EC3552 / VLSI and Chip Design

| CO No. | Course Outcomes (COs) |
|---------------|---|
| C302.1 | Describe the fundamental characteristics of MOS transistors and CMOS logic families, including their static and dynamic behavior. |
| C302.2 | Apply design principles to construct combinational logic circuits using static and dynamic logic techniques. |
| C302.3 | Analyze timing strategies and sequential elements to evaluate synchronous and self-timed circuit designs. |
| C302.4 | Design memory blocks and arithmetic circuits using programmable logic and interconnect modeling. |
| C302.5 | Evaluate ASIC design flows and testing techniques by creating test benches and applying scan-based test methods. |

Course Code / Course Name: EC3551 / Transmission lines and RF Systems

| CO No. | Course Outcomes (COs) |
|---------------|---|
| C303.1 | Explain the characteristics of transmission lines, including their types, behavior, and losses, to understand their role in signal transmission |
| C303.2 | Calculate the standing wave ratio (SWR) and input impedance for highfrequency transmission lines to assess their performance in practical communication systems |
| C303.3 | Analyze impedance matching techniques using stubs and Smith Charts to ensure efficient signal transmission and minimal reflection in transmission lines |
| C303.4 | Comprehend the characteristics of Transverse Electric (TE) and Transverse Magnetic (TM) waves, focusing on their behavior in different waveguides and transmission media.. |
| C303.5 | Design an RF transceiver system for wireless communication, integrating components for transmission and reception while considering factors such as frequency, modulation, and signal |

Course Code / Course Name: CEC362/VLSI Testing and Design for Testability - Professional Elective I

| CO No. | Course Outcomes (COs) |
|--------|---|
| C304.1 | Understand Master SOC-level test requirements & metrics, including validation of IP integration, clocking, I/Os, analog, logic, memory, power domains, and DUT/DFT partitioning for test-hand-off and tester optimization |
| C304.2 | Design and optimize the concepts of scan and BIST infrastructure, incorporating various scan strategies, compression, FSM/LFSR controllers, STUMPS architecture, and IP/SOC partitioning techniques. |
| C304.3 | Acquire knowledge and implement memory test strategies and test interfaces, using fault models, MBIST controllers, and industry-standard frameworks (IEEE-1500, JTAG, boundary scan) for hierarchical testing. |
| C304.4 | Integrate test-aware design and low-power techniques, applying congestion-aware floor planning, scan power gating, ATPG optimizations, test scheduling, and secure embedded test architecture |
| C304.5 | Develop analog/mixed-signal test architectures, including DFT and BIST for PLLs, ADCs, DACs, SerDes, RF blocks, and differentiate defect tests and performance measurements. covering SAF, TDF, PDF, IDDQ, bridging and delay defects and CAD optimizations |

Course Code / Course Name: CCS338 / Computer Vision - Professional Elective II

| CO No. | Course Outcomes (COs) |
|--------|---|
| C305.1 | Describe the basic principles, theoretical frameworks, and methodologies in image processing and computer vision. |
| C305.2 | Demonstrate image processing solutions by integrating basic and advanced methods in OpenCV. |
| C305.3 | Implement image alignment, segmentation, and motion estimation using 2D feature-based approaches. |
| C305.4 | Utilize appropriate methods for 3D image reconstruction from image data. |
| C305.5 | Develop innovative solutions using image processing and computer vision techniques for practical applications. |

Course Code / Course Name: CBM370-Wearable Devices - Professional Elective III

| CO No. | Course Outcomes (COs) |
|--------|---|
| C306.1 | Understand the fundamentals, components, and types of wearable systems and sensors used in health monitoring. |
| C306.2 | Analyze signal processing challenges and energy harvesting techniques for wearable device design. |
| C306.3 | Describe wireless health systems and body area networks (BAN) with emphasis on architecture and communication techniques. |
| C306.4 | Understand smart textiles, fabrication techniques, and their applications in physiological monitoring. |
| C306.5 | Identify and explain applications of wearable systems in healthcare, sports, and patient monitoring. |

Course Code / Course Name: MX3084-Disaster Risk Reduction and Management

| CO No. | Course Outcomes (COs) |
|---------|---|
| CE307.1 | Impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR) |
| CE307.2 | Enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction |
| CE307.3 | Develop disaster response skills by adopting relevant tools and technology |
| CE307.4 | Enhance awareness of institutional processes for Disaster response in the country. |
| CE307.5 | Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity. |

Course Code / Course Name: EC3561 / VLSI Laboratory

| CO No. | Course Outcomes (COs) |
|--------|---|
| C308.1 | Examine the HDL code for basic as well as advanced digital integrated circuit. |
| C308.2 | Import the logic modules into the FPGA Boards. |
| C308.3 | Synthesize Place and Route the digital IPs. |
| C308.4 | Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA Tools. |
| C308.5 | Analyze the Test and verification of IC design. |

SEMESTER VI

Course Code / Course Name: ET3491 / Embedded Systems and IOT Design

| CO No. | Course Outcomes (COs) |
|--------|---|
| C308.1 | Explain the architecture and key features of the 8051 microcontroller, highlighting its function. |
| C308.2 | Construct a model of an embedded system, incorporating relevant design principles, hardware components, and software requirements to create a working prototype. |
| C308.3 | Identify and list the fundamental concepts of real-time operating systems, including task scheduling, resource management, and time constraints, to understand their application in embedded systems. |
| C308.4 | Examine the architecture and communication protocols of the Internet of Things (IoT), analyzing how different protocols facilitate the seamless interaction between devices in IoT networks. |
| C308.5 | Design an IoT-based system tailored to a specific application, demonstrating an understanding of hardware, software, and communication protocols to build a functional, real-world solution. |

Course Code / Course Name: CS3491/ Artificial Intelligence and Machine Learning

| CO No. | Course Outcomes (COs) |
|---------------|---|
| C309.1 | Understand the fundamental concepts of Artificial Intelligence, problem-solving techniques and various search algorithms to develop intelligent agents. |
| C309.2 | Develop a Bayesian network that applies first principles of mathematics and engineering sciences to identify solutions for both exact and approximate inference in complex engineering problems. |
| C309.3 | Apply Linear, Logistic regression models, probabilistic models, decision trees, naïve bayes classifier and random forests for any real-world problem which helps in solving complex engineering problems. |
| C309.4 | Analyse a suitable unsupervised machine learning models like K-means, K-Nearest Neighbour, bagging and boosting by applying first principles of mathematics to design a solution for any complex engineering problem. |
| C309.5 | Design a neural network for binary and multi-class classification problems by reducing the error rates by incorporating appropriate techniques like hyper parameter tuning and batch normalization techniques. |

Course Code / Course Name: CCW332 / Digital Marketing - Open Elective- I

| CO No. | Course Outcomes (COs) |
|---------------|--|
| C311.1 | To examine and explore the role and importance of digital marketing in today's rapidly changing business environment |
| C311.2 | To focus on how digital marketing can be utilized by organizations and how it's effectiveness can be measured |
| C311.3 | To know the key elements of a digital marketing strategy |
| C311.4 | To study how the effectiveness of a digital marketing campaign can be measured |
| C311.5 | To demonstrate advanced practical skills in common digital marketing tools such as SEO, SEM, Social media and Blogs |

Course Code / Course Name: CEC366 / Image Processing - Professional Elective IV

| CO No. | Course Outcomes (COs) |
|---------------|--|
| C312.1 | Explain the fundamental concepts of digital image processing including image digitization, sampling, quantization, and two-dimensional transforms. |
| C312.2 | Apply image smoothing, sharpening, and enhancement techniques to process digital images. |
| C312.3 | Analyze image degradation models and apply appropriate restoration and filtering techniques. |
| C312.4 | Analyze and implement image segmentation, feature extraction, compression, and recognition techniques for color image models. |
| C312.5 | Evaluate image compression methods based on compression ratio, image quality, and application requirements. |

Course Code / Course Name: CEC348 / Remote Sensing - Professional Elective V

| CO No. | Course Outcomes (COs) |
|--------|---|
| C312.1 | Explain the principles of electromagnetic radiation and describe the key laws (Planck's, Wien's Displacement, Stefan-Boltzmann, Kirchhoff's). |
| C312.2 | Describe how radiation interacts with the atmosphere (scattering, absorption, refraction) and how atmospheric windows affect remote sensing. |
| C312.3 | Identify the types of remote sensing platforms (ground-based, airborne, and spaceborne). |
| C312.4 | Compare and contrast scanners (along-track vs. across-track) and their applications. |
| C312.5 | Evaluate the accuracy of data products and recommend methods for improving interpretation quality. |

SEMESTER VII

Course Code / Course Name: GE3791 / Human Values and Ethics

| CO No. | Course Outcomes (COs) |
|--------|---|
| C401.1 | Explain the impact of the French Revolution, American Independence, and the Indian Freedom Movement on the development and implementation of democratic values. |
| C401.2 | Apply secular principles to contemporary issues of religious tolerance and discrimination, proposing practical solutions based on secular values. |
| C401.3 | Analyze the role of evidence-based approaches in validating facts and developing scientific knowledge. |
| C401.4 | Assess the role of inclusive practices in promoting social equity, justice and promote gender equality. |
| C401.5 | Propose ethical guidelines for responsible scientific research, innovation and frameworks for ensuring fairness and accountability in scientific advancements. |

Course Code / Course Name: GE3751 / Principles of Management

| CO No. | Course Outcomes (COs) |
|--------|---|
| C402.1 | Discuss the evolution of management thoughts and the challenges of managerial activities in a global business environment |
| C402.2 | Explain the types of Planning and Decision making methodologies in Organizations. |
| C402.3 | Summarize various types of Organization structure and associated Human Resources activities for man-power utilization. |

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|--------|--|
| C402.4 | Explain about motivation theories, behaviour, leadership theories and communication for effective directing. |
| C402.5 | Explain various Controlling techniques to maintain standards in Organizations. |

Course Code / Course Name: AI3031 / IT in agricultural system - Open Elective – II

| CO No. | Course Outcomes (COs) |
|--------|---|
| C403.1 | Gain foundational knowledge of agricultural processes and how automation techniques can enhance productivity and efficiency in farming. etc. |
| C403.2 | Understand practical farming techniques and methodologies that support continuous learning and adaptation in agricultural practices. |
| C403.3 | Learn about various sensors and automation tools used in agriculture to monitor and optimize farming operations. |
| C403.4 | Grasp the concepts of climate variability, weather forecasting, and how global models and seasonal applications impact agricultural planning and decision-making. |
| C403.5 | Explore the role of expert systems, e-commerce platforms, and agricultural databases in modern farming. Additionally, the course will cover how technology can support rural development and e-learning initiatives in agriculture. |

Course Code / Course Name: OHS351 / English for competitive examinations - Open Elective – III

| CO No. | Course Outcomes (COs) |
|--------|--|
| C404.1 | Expand vocabulary and apply practical techniques to read and comprehend a wide range of texts with the appropriate emphasis required for academic and professional contexts. |
| C404.2 | Identify and correct errors in writing with precision, while ensuring clarity and coherence in the expression of ideas. |
| C404.3 | Understand the importance of task fulfillment and utilize task-appropriate vocabulary to enhance written and spoken communication. |
| C404.4 | Communicate effectively in group discussions, presentations, and interviews by practicing active listening, clear articulation, and engaging with others' ideas. |
| C404.5 | Write topic-based essays with precision and accuracy, focusing on developing well-structured arguments and clear, concise writing. |

Course Code / Course Name: OHS352 / Project report writing - Open Elective – IV

| CO No. | Course Outcomes (COs) |
|--------|---|
| C405.1 | Develop effective project reports, demonstrating clear structure, logical flow, and appropriate content for the intended audience. |
| C405.2 | Apply statistical tools with confidence to analyze data and present findings in a structured and clear manner. |
| C405.3 | Explain the purpose and intention of the proposed project with coherence and clarity, emphasizing its significance and relevance. |
| C405.4 | Create written texts tailored to achieve the intended purpose, ensuring clarity, precision, and organization in technical and non-technical contexts. |
| C405.5 | Master the art of writing compelling proposals and project documents, using appropriate formats, tone, and persuasive techniques. |

Course Code / Course Name: EC3711 / Summer internship

| CO No. | Course Outcomes (COs) |
|--------|---|
| C406.1 | Apply system-level design processes, verification and validation techniques, and production methodologies to solve industrial or research challenges. |
| C406.2 | Analyze industrial or research problems to determine root causes and develop appropriate solutions based on evidence and logic. |
| C406.3 | Evaluate system specifications, design methodologies, process parameters, and testing results to ensure their effectiveness and compliance with objectives. |
| C406.4 | Create a detailed technical report by synthesizing information on the problem, design approach, methodology, and outcomes. |
| C406.5 | Communicate project outcomes and solutions effectively through oral presentations and viva-voce discussions. |

SEMESTER VIII

Course Code / Course Name: EC3811 / Project Work / Internship

| CO No. | Course Outcomes (COs) |
|--------|---|
| C407.1 | Identify a relevant industrial or research problem, define objectives clearly, and outline a structured methodology for solving it. |
| C407.2 | Develop experimental methods or procedures to address the problem using appropriate tools and techniques systematically. |
| C407.3 | Evaluate the experimental results to interpret data, validate findings, and propose effective solutions to the problem. |
| C407.4 | Create a detailed project report covering problem definition, literature review, methodology, results, conclusions, and references. |
| C407.5 | Present the project outcomes effectively through oral presentations and defend the work confidently during viva-voce. |


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