



Course Description
Electronics Engineering Program

11100	Computer Skills (Remedial)
	Credit Hours:0
	This course aims to develop learners' ability to use computers in various aspects of their lives. The course introduces the primary concepts of computers, and the basics of using a GUI-based desktop operating system and office productivity tools including word processing, spreadsheets, and presentation applications, in addition to basics of using emails and navigating through the world wide web. At the end of this course, the students are expected to be able to use desktop computer for everyday tasks.
31021	Arabic Language Communication Skills (Remedial)
	Credit Hours:0
	This course aims to develop the student's cognitive abilities in the basics of the Arabic language, through a variety of chosen literary texts, followed by a variety of topics including some simplified grammatical issues. In addition, it focuses on the skill of writing such as spelling, punctuation and the use of the Arabic dictionary, which prepare the student to possess the necessary knowledge, reading, writing, listening and conversation, on which the Arabic language communication skills course is based.
31019	Arabic Language (Remedial)
	Credit Hours:0
	This course focuses on the applications that develop the four skills through a set of various tools. The aim is to give students trainings so that they can read loudly and silently, comprehend what they listen to, deepen their abilities to write creatively and functionally, and develop 'speaking' skills
31022	English Language Communication Skills (Remedial)
	Credit Hours:0
	This course aims at developing the four skills (listening, reading, writing and speaking) and at enabling students to read the different texts and summarize them in their own language as well as guessing the meaning of the word from the context and make predictions before

	reading for main ideas. Since this course is intended for students who are less proficient in the English language, the focus is on giving students the structure of different sentences through the grammar lessons, which in turn enables the student to write correct sentences and thus speak without errors by constructing correct sentences when speaking. Regarding vocabulary, the students will be able to find and use synonyms as well as use context clues to find meaning.
31029	English Language (Remedial)
	Credit Hours:0
	This course is offered to students at the intermediate level to develop the students’ ability in the four basic skills: reading, writing, speaking and listening. The materials and activities included in the course are designed in such a way to provide practice in these four skills. Therefore, the practice will improve the students’ use of English for academic purposes and communication
31112	Arabic Language Communication Skills
	Credit Hours:3
	This course addresses communication skills in Arabic (Reading, writing, listening and speaking). It focuses on the applications that develop these skills through a set of various basics and tools. The aim is to give students trainings so that they can read loudly and silently, comprehend what they listen to, deepen their abilities to write creatively and functionally, and develop ‘speaking’ skills through, debate, discussions and critical thinking.
31111	Arabic Language
	Credit Hours:3
	This course addresses the communication skills in Arabic (Reading, writing, listening and speaking). It focuses on the applications that develop these skills through a set of various basics and tools. The aim is to give students trainings so that they can read loudly and silently, comprehend what they listen to, deepen their abilities to write creatively and functionally, and develop ‘speaking’ skills through, debate, discussions and critical thinking.
31122	English Language Communication Skills
	Credit Hours:3

	This course aims at developing students’ ability in the four basic skills: (reading, writing, speaking and listening). Practice will improve the students’ use of English for academic purposes and communication. The speaking is intended to enable students practice the oral skills and to improve students’ pronunciation. Thus, different speaking techniques are undertaken during classes throughout the semester.
31121	English Language
	Credit Hours:3
	This course aims at developing students’ ability in the four basic skills: (reading, writing, speaking and listening). Practice will improve the students’ use of English for academic purposes and communication. The speaking is intended to enable students practice the oral skills and to improve students’ pronunciation. Thus, different speaking techniques are undertaken during classes throughout the semester.
31151	National Education
	Credit Hours:3
	This course discusses Jordan: the land, people and homeland, the Arab nation, history of Jordan, political system, Jordanian society, major national institutions, internal and external challenges facing Jordan as well as the role of local institutions in achieving development in national awareness and the family and its role in society.
31160	Leadership & Societal Responsibility
	Credit Hours:0
	This course covers different theoretical and frameworks of leadership, moral leadership, and the philosophical foundations of socially responsible leadership. Further, this course explores the manner in which leaders personally and professionally deal with ethical and social issues as they guide their organizations in such a way to instill and optimize positive social impact.
31162	Leadership & Societal Responsibility
	Credit Hours:1
	This course covers different theoretical and frameworks of leadership, moral leadership, and the philosophical foundations of socially responsible leadership. Further, this course explores

	the manner in which leaders personally and professionally deal with ethical and social issues as they guide their organizations in such a way to instill and optimize positive social impact.
31153	Introduction to Society, Technology and Environmental Protection
	Credit Hours:0
	This course aims to inform the student on the issues that are of most concern to him during his university career, and links them to his community and the surrounding environment. These issues include university life and numerous general cultural topics which help to strengthen the student's sense of loyalty and belonging to his university and local community.
31251	Military Science
	Credit Hours:3
	This course is intended to present the history of the Jordanian army, Jordanian peace forces, preparing the nation for defense and liberation, as well as genesis and development of the Hashemite Kingdom of Jordan
31254	Entrepreneurship and Innovation
	Credit Hours:3
	This course focuses on the behaviour and attributes of entrepreneurs who operate in a competitive environment. It elaborates on the role of entrepreneurs in a competitive market and that of government in the creation of a business environment conducive to entrepreneurship. The course also highlights the relevance of attitudes, values and beliefs to entrepreneurial activity; the management of risks; the process of new product development; and the reasons for the high failure rate of new businesses. Students are expected to prepare a business plan for a new business as their main objective by the end of the semester. The course will develop students' skills and understanding of the risks and rewards of entrepreneurial activities. There will be a special focus on SMEs and entrepreneurship in Jordan.
31256	Entrepreneurship and Innovation
	Credit Hours:1
	This course focuses on the behaviour and attributes of entrepreneurs who operate in a competitive environment. It elaborates on the role of entrepreneurs in a competitive market

	and that of government in the creation of a business environment conducive to entrepreneurship. The course also highlights the relevance of attitudes, values and beliefs to entrepreneurial activity; the management of risks; the process of new product development; and the reasons for the high failure rate of new businesses. Students are expected to prepare a business plan for a new business as their main objective by the end of the semester. The course will develop students' skills and understanding of the risks and rewards of entrepreneurial activities. There will be a special focus on SMEs and entrepreneurship in Jordan.
31255	Entrepreneurship for Business
	Credit Hours:3
	This course focuses on the behaviour and attributes of entrepreneurs who operate in a competitive environment. It elaborates on the role of entrepreneurs in a competitive market and that of government in the creation of a business environment conducive to entrepreneurship. The course also highlights the relevance of attitudes, values and beliefs to entrepreneurial activity; the management of risks; the process of new product development; and the reasons for the high failure rate of new businesses. Students are expected to prepare a business plan for a new business as their main objective by the end of the semester. The course will develop students' skills and understanding of the risks and rewards of entrepreneurial activities. There will be a special focus on SMEs and entrepreneurship in Jordan.
31371	Health Education
	Credit Hours:3
	This course is an attempt to understand the responsibility we have for our own health, learn skills for dealing with emergency cases, and have personal safety and accident prevention as well as discussing mental health, mental illness and stress.
31372	Business Skills
	Credit Hours:3

	Business Skills Subject, Maharat Training for Employability/Maharat Training for Entrepreneurship is implemented over 10-12 weeks that gives Jordanian youth the ideal tools and equips them with the skills required to become productive members of society capable of obtaining jobs as well as becoming successful entrepreneurs. The course is taught using the Maharat methodology, “Learning by Doing” and is conducted within an interactive business-like environment, providing the practical skills necessary for fresh graduates to land successful careers.
31373	21st Century Skills
	Credit Hours:3
	This course aims to teach the students the essential skills of the 21 st Century Which includes Learning skills, Literacy skills, and Life skills
31374	Life Skills
	Credit Hours:3
	This course aims to help students explore and develop the essential skills on a personal and professional level in the age of the Internet, by educating them on how to improve their decision-making process and apply critical/creative thinking to reach ultimate solutions for different situations/problems that they can experience within a business environment. The module is broken into three main categories: Learning Skills, Literacy Skills, and Life Skills. All of which intend to support students in keeping up with the lightning-pace of today’s modern marketplace and to better prepare them for the competitive job market they are about to enter.
31375	Life Skills
	Credit Hours:1
	This course aims to help students explore and develop the essential skills on a personal and professional level in the age of the Internet, by educating them on how to improve their decision-making process and apply critical/creative thinking to reach ultimate solutions for different situations/problems that they can experience within a business environment. The module is broken into three main categories: Learning Skills, Literacy Skills, and Life Skills. All of which intend to support students in keeping up with the lightning-pace of today’s modern marketplace and to better prepare them for the competitive job market they are about to enter.

20251	History of Science
	Credit Hours:3
	Classification of the Sciences, The Importance of the History of Science, Historical Periodization of Natural Science in the Mediterranean Basin, Epistemological Periodization of Natural Science, Natural Philosophy, Aristotle’s Cosmology and Physics, Greek Astronomy, Arabic Astronomy, The Scientific Revolution: Copernicus, Tycho, Gilbert, Kepler, Galileo, Descartes, Newton.
31100	Health & Sport
	Credit Hours:3
	This course deals with the concept of physical education and how it relates to our general concept of education, as well as its objectives and historical development. Also examined are the different fields and types of contemporary sports education. While studying human anatomy in detail, the course explains the effect of sports activity on different parts of the body, as well as discussing the various elements that contribute to physical fitness. The student also learns about a number of tests designed to measure different aspects of physical fitness. The course deals with nutrition in terms of basic food groups and the roles they play in the human body, in addition to looking at the most common sports injuries and their symptoms. The course also examines a number of today’s diseases such as obesity, anorexia, diabetes and heart disease, concentrating on their causes and how to prevent them. The course discusses some contemporary issues regarding demand for sports activities
31130	Foreign Language
	Credit Hours:3
	PSUT offers some foreign languages such as Mandarin (Chinese) course, Spanish, French and other languages to catch up with language skills trend. In each of the languages offered, Students will learn the pronunciation, Common words and some basic but practical grummer, such as introduction of oneself, greeting, hoppy, shopping, etc. The Course also covers some basic theoretical principles in the art of translation, qualities of translator, problems involved in translation and analysis of translated texts. The course aims at equipping students with the skills of practical translation from Arabic into English and vice versa. The Course will be mainly

	applied offering practice in translating a variety of texts from various fields of knowledge: Economy, Politics, Literary texts, Administrations, fashion, Media, Sports etc.
31152	Arab Islamic Civilization
	Credit Hours:3
	Arab-Islamic civilization is considered an extension of Arabs heritage and their history through the successive historical stages and a linked series of Arab history and civilization’s rings. It is derived from faith, social cultural and intellectual assets of Islamic Arab society.(Arab Islamic civilization) course stems from Arab and Islamic constant stopped by tolerant Islamic faith, Arab heritage and Arab history and their civilization.
31211	Arabic literature
	Credit Hours:3
	The aim of this course is to developing students’ taste of Arabic literature through reading of literature essays, analysis, introducing some literature aspects from different eras, introducing some preliminary concepts such as: literature, text, taste, criticism, realizing the basic steps in processing the literary text, recognizing the literary texts of different genres, such as: poetry, Thoughts, story, Essay, and authors of her book and studying models of literary texts which belong to different periods of time, and analysis and interpretation
31252	Governance and Development
	Credit Hours:3
	The course covers the basic concepts of governance and development, the nature of the impact associated with the mechanisms of good governance and its indicators on the levels of development in the country. The course highlights the conceptual framework of the concept of good governance and its origins, along with its political, economic, administrative and cultural dimensions; as well as various standards and indicators. The course also covers the concept of development and its theories, types and dimensions, with a focus on indicators of sustainable development. The course deals with the nature of the environment created by different forms of government, and the impact on economic growth rates in the long term, and the role of good governance as a link to transforming economic growth into sustainable development by creating an enabling environment for development. It also addresses the role

	of the system of values and principles associated with good governance, and the complementary roles of its three components (the State, the private sector and civil society), in addition to the pivotal role of the effectiveness of governance in influencing development policies by attracting financial aid, solving the issue of poverty and achieving stability, in a comparative study of the reality of these concepts in developing countries and developed countries.
31257	Media and Digital Literacy
	Credit Hours:3
	This course aims to provide students with the knowledge necessary to understand and analyze media messages in their various forms. This course aims to provide students with the knowledge necessary to understand and analyze media messages in their various forms. In addition, it equips them with digital and media skills that enhance critical thinking in evaluating and creating media content. Moreover, it enables them to use media and information sources in a conscious and responsible manner, particularly digital communication tools and social media networks. The course strengthens students’ ability to identify and confront unprofessional media messages and practices and harmful and inappropriate media content such as misinformation, disinformation, rumors, and hate speech.
31260	Human Rights
	Credit Hours:3
	The course includes the definition of human rights, their importance, characteristics, intellectual and philosophical roots. It focuses on the historical development of human rights, their sources, types, and criteria for differentiating them, including civil and political rights, economic, social and cultural rights. in addition, the course addresses human rights that are guaranteed through charters, conventions, international declarations, national legislation and mechanisms for protecting these rights. The course also sheds light on humanitarian intervention and attitudes towards it, especially in the post-Cold War period. It, further, deals with the impact of globalization mechanisms on human rights, with a focus on discussing applied cases at the international level

31261	Introduction to Politics and Economic Science
	Credit Hours:3
	The course addresses the nature of political economy, the issues of political economy, and the importance of the market. Market effects and political economy, three ideologies of political economy, the dynamics of the international political economy, the political economy of structural changes, long-term variations of economic growth and the effect of political hegemonic, the politics of international trade, the political economy of international finance.
31262	Introduction to Educational Science
	Credit Hours:3
	This course discusses education principles and philosophy, education and individuals, education and learning, education and society, education and development, educational courses and methods, educational institutions and educational assessments and education in the Arab and Islamic worlds
31264	Introduction to Psychology
	Credit Hours:3
	The course deals with the concept of psychology, its history, schools, main fields, and research methods. It also deals with the concept of growth, its principles, factors affecting it, and its various stages. The course shows the nature of motivation, the development of its concept, and the classification of motivations. The course focuses on the nature and theories of learning. The course also deals with the concept of intelligence, factors affecting it, and methods of measuring it. It also focuses on personality, its theories, and its measurements. The course also deals with some aspects of stress, defense mechanisms, treatment methods and methods of psychological counseling.
31271	Environmental Science
	Credit Hours:3
	This course focuses on the basic concepts in ecology; organization, structure and function of ecosystem and ecosystem properties; cycling of matter and flow of energy in ecosystems and their equilibrium; factors involved in the regulation, growth, and general dynamics of populations; data needed to describe populations, population growth, population models, and

	regulatory mechanisms; spatial and temporal variation and properties of populations; community structure and interactions; succession patterns in aquatic and terrestrial communities.
31272	Development and Environment
	Credit Hours:3
	This course has five different components; introducing learner to the relationship between the environment (natural resources, ecosystem services) and development, the link between environment and development process along with the multiple dimensions of sustainability, analyzing the sustainable development and the approach to achieve the development, environmental quality, and social equity, presenting theoretical perspectives of development and environment and how to achieve its sustainability. The course also gives a comprehensive introduction to all major issues, ways of saving the earth from ecological collapse, as well as defining the roles of sustainable development on the future of humanity.
31311	Scientific Research Methods
	Credit Hours: 3
	This course outlines the concept of scientific research including its nature, categories, elements, and procedures. This course also presents a comprehensive introduction to data collection tools, the use of statistical methods in analysis and interpretation, SPSS, the generation of findings and recommendations, in addition to the use of libraries, references, and online documentation in preparing academic reports.
31351	Contemporary Issues in the Arab World
	Credit Hours: 3
	This course focuses on social and national fragmentation in the Arab east: Features and roots, the Arab-Israeli conflict, democracy and civil society in the Arab world, pan- Arabism and Islam, the self and the other, secularism, the Arabs and globalization and human security in the Arab world.
31352	Jerusalem: History and facts
	Credit Hours: 3

	The aim of the course is to address the following topics: the geographic borders of Al-Quds through history, a glance at the historical discoveries in Al-Quds, al-Quds and the British occupation, the establishment of Israel, the Israeli plans to jadeite Al-Quds, importance of Al-Quds from religion point of view, the infringements of Al-Aqsa mosque since 1967 by Israel.
31161	Introductions to Library Science
	Credit Hours: 3
	This course discusses how to get to information sources, the types of cataloging, the types of catalogs, types of classification, information and knowledge, information society, information services. Information technology, information storage, information retrieval and dissemination, information and Internet.
31361	Introduction to Philosophy
	Credit Hours: 3
	The course tackles the definition of philosophy, the relation between philosophy and science, the science-based and religion-based thoughts, a historical review of philosophy and science, a discussion of the most important fields in philosophy.
31362	Philosophy and Critical Thinking
	Credit Hours: 3
	This course aims to build the theoretical mind and philosophical understanding, and to provide the student with thinking skills, including critical thinking. It presents the student with the foundations of philosophical thinking and methods of investigation and logical reasoning. In addition, it introduces to the rules of organized thinking and its procedural, and what it contains of the foundations of the theory of knowledge and access to the formation of mental bases. Furthermore, it equips students with the learning the skills of critiquing scientific texts and evaluating different situations in life to reach correct conclusions and solutions based on the facts and existing data.
20252	The Arabic-Islamic Scientific Heritage
	Credit Hours: 3
	Arabs and Muslims as Builders of a Civilization; Ancient Civilizations: Mesopotamia, Egypt, the Greek, the Hindu and Chinese; Transmission of Foreign Literature, Learning, Schools and

	Learning Resources, Experimenting and Observations; Mathematics and Geometry, Astronomy, Astronomical Instrumentation, Timekeeping and Calendars, Mechanics, Chemistry, Medicine and Pharmacy, Hospitals, Industry, Geography, Aviation, Posting and Communications, Irrigation and Care of Rivers.
11103	Structured Programming
	Credit Hours:3
	This course aims to introduce the fundamentals of structured programming using a high-level programming language. Topics include concepts of structured programming, program design, development. Syntax and semantics of the presently adopted language so that students will develop the ability to program in the language. Basic elements of the language: variables, constants, and data types. Basic input/output functions. Conditional and iterative control structures. Functions (or methods) and parameter passing. Recursive functions (or methods). References and dynamic variables. Basic data structures: one and two-dimensional arrays, string manipulation and structure. At the end of this course, students are expected to be able to analyze a computing problem, design, and implement a solution using a high-level programming language.
11151	Structured Programming Lab
	Credit Hours:1
	This course aims to build practical skills for structured programming using a high-level programming language. At the end of this course, students are expected to be able to analyze a computing problem, design, and implement a solution using a high-level programming language.
20132	Calculus (1)
	Credit Hours: 3
	Functions and Their Graphs, Combining Functions, Shifting and Scaling, Trigonometric Functions, Exponential Functions, Inverse Functions and Logarithms, Inverse Trigonometric Functions, Tangents to Curves, Limits of a Function and Limit Laws, Continuity, The Intermediate Value Theorem, Limits Involving Infinity, Asymptotes, Tangents and Derivatives at a Point, The Derivative as a Function, Differentiation Rules, Derivatives of Trigonometric



	Functions, The Chain Rule, Implicit Differentiation, Derivatives of Inverse Functions and Logarithms, Derivatives of Inverse Trigonometric Functions, Extreme Values of Functions, Rolle's Theorem, The Mean Value Theorem, Monotonic Functions and The First Derivative, Concavity and Inflection Points, Curve Sketching, Indeterminate Forms and L'Hopital's Rule, Antiderivatives, Definite Integrals, The Fundamental Theorem of Calculus, Indefinite Integrals and the Substitution Method, Applications of Definite Integrals: Area Between Curves, Volumes of solids: Slicing Method, Disc Method, Washer Method, and Cylindrical Shell Method.
20133	Calculus (2)
	Credit Hours: 3
	Hyperbolic Functions, Integration of Transcendental Functions, Techniques of Integration: Integration by Substitution (Review), Integration by Parts, Integration Including Powers of Trigonometric Functions, Integration by Trigonometric Substitution, Partial Fractions, Other Techniques, Improper Integrals, Sequences, Limit of Sequence; Series: Convergent and Divergent Series; Series Tests for Convergence: Partial Sums, Telescoping Series, Geometric Series, Base Divergence Test, Integral Test, P-series Test, Ratio Test, Root Test, Absolute Convergence Test, Alternating Series Test, Conditional Convergence; Power Series and Taylor series, Interval and Radius of Convergence, Parametric Equations of Curves in Plane, Polar Coordinates, Graphs in Polar Coordinates.
20140	Basic Concepts in Chemistry
	Credit Hours: 1
	Matter and Measurements; Atoms, Molecules, and Ions; The Periodic Table; Ions and Ionic Compounds; Stoichiometry: Calculations with Chemical Formula and Equations; Avogadro's Number and the Mole; Basic Concepts of Chemical Bonding; Gases: Pressure, The Gas Laws, and the Ideal-Gas Equation.
20141	Physics (1)
	Credit Hours: 3

	Physics and Measurement, Motion in One Dimension, Vectors, Motion in Two and Three Dimensions, Newton's Laws of Motion, Circular Motion and Other Applications of Newton's Laws, Work and Energy, Conservation of Energy, Conservation of Linear Momentum and Collisions, Rotational Motion.
20142	Physics (2)
	Credit Hours: 3
	Electric Fields, Gauss's Law, Electric Potential, Capacitance and Dielectrics, Current and Resistance, Direct-Current Circuits, Magnetic Fields, Sources of Magnetic Fields, Faraday's Law, Inductance.
20150	Physics Lab
	Credit Hours: 1
	Basic Measurements and Introduction to Errors and Graphs, Static Equilibrium, The Laws of Motion, Ohm's Law, Resistance and Resistivity, Power Transfer, Wheatstone Bridge, Kirchhoff's Rules, RC-circuits, AC Circuits: RC- and RL-Circuits.
20148	Physics (1) Lab
	Credit Hours: 1
	Introduction to Errors and Graphs, Basic Measurements, Static Equilibrium, The Laws of Motion, Simple Harmonic Motion, Moment of Inertia, Viscosity.
20149	Physics (2) Lab
	Credit Hours: 1
	Ohm's Law, Resistance and Resistivity, Power Transfer, Wheatstone Bridge, Kirchhoff's Rules, RC-circuits; AC Circuits: AC-Waveforms, RC- and RL-Circuits, RLC Series Resonance Circuit.
20200	Technical Writing & Communication Skills
	Credit Hours: 3
	Engineering and Writing: Controlling the Writing System. Letters, Email, and Other Media for Engineers. Writing Style for Business Correspondence, Communication Strategies for Tricky Situations, Business Letters, Email, New Internet Media. Writing Common Engineering Documents: Research, Laboratory, and Field Reports, Specifications, Proposals, Progress

	Reports, Instructions, Recommendation Reports. Writing Research Paper and Design Reports. Constructing Engineering Tables and Graphics: Tables, Charts and Graphs, Illustrations, Graphics and Tables (Guidelines). Engineering Your Speaking: Preparing The Presentation, Delivering the Presentation. Writing to Get an Engineering Job: Engineering Resume, Application Letter, Follow-Up Letter. Engineering Your Online Reputation: Introduction to Social Media Management.
20231	Calculus (3)
	Credit Hours: 3
	Three Dimensional Coordinate System, Vectors, Dot and Cross Products, Lines and Planes in Space, Cylindrical and Quadric Surfaces, Curves in Space and Their Tangents, Integral of Vector Functions, Arc Length in Space, Curvature and Normal vectors of A Curve, Tangential and Normal Components of Acceleration, Velocity and Acceleration in Polar Coordinates, Functions of Several Variables, Limits and Continuity in Higher Dimensions, Partial and Directional Derivatives, Chain Rule, Gradient Vector, Tangent planes and Normal lines of Surfaces in Space, Differentials, Extreme values and Saddle Points, Lagrange Multipliers, Double Integrals in Cartesian and Polar Coordinates, Triple integrals in Cartesian, Cylindrical and Spherical Coordinates.
21218	Engineering Drawing Lab
	Credit Hours: 1
	Introduction to engineering drawing and AutoCAD software. Setting up drawing parameters. Coordinates entry. Object snap. Basic editing techniques. Blocks. Multi-lines. Polylines. Spline. Layers. Dimensions. Orthographic projection. Auxiliary views. Sections. Three-dimensional pictorials. Editing solids and 3-D operations. Boolean Operations.
21219	Engineering Workshop
	Credit Hours: 1
	Industrial and personal safety at site, basic electrical components and instruments. Electrical wiring and printed circuit boards. Covers the design thinking methodology to identify and address engineering problems. Includes solid modeling, rapid prototyping, understanding end users, their unarticulated needs, and creating alternative solutions. Focus on creativity, identify

	potential solutions, and innovation of new products and work processes.
24411	Engineering Ethics
	Credit Hours: 1
	Safety and responsibility. Professional responsibility to customers and to employers. Blowing the whistle. Codes of ethics and honor. Professional choices. Legal obligations. Standard ethics theories. Case studies. Responsible AI development. Social Impact of AI technologies. National Code of Ethics for Artificial Intelligence: Principles and Guidelines.
32431 23411 27411	Engineering Economics
	Credit Hours: 3
	Cost concepts, Decision making process, Concepts of time value of money, Simple and compound interest, Interest formulas, rate of return, cash flow, project evaluation methods, break-even analysis, evaluating a single project, comparison and selection among alternatives and Depreciation calculations.
21318	Computer-Aided Engineering Design Workshop
	Credit Hours: 1
	This laboratory course provides hands-on experience in the design, fabrication, assembly, and testing of printed circuit boards (PCBs). Students will learn to use modern EDA tools to design schematics and layouts, generate manufacturing files (Gerber), and fabricate PCBs using CNC milling, photolithography, and toner transfer techniques. The course also covers through-hole (THT) and surface-mount (SMD) soldering, rework techniques, and circuit debugging using standard laboratory instruments. By the end of the course, students will be able to develop complete PCB-based systems from concept to working prototype, following Design for Manufacturing (DFM) and safety practices.
27401	Industry Apprenticeship Practicum
	Credit Hours: 3
	The industry apprenticeship practicum course aims to prepare students to acquire the essential skills and knowledge required to succeed in engineering workplace environments and field training. The course covers topics related to effective communication, teamwork, professional ethics, understanding labor market requirements, and career pathway planning through

	resume preparation, readiness for job interviews, and dealing with workplace expectations. It also introduces students to the impact of modern digital technologies on engineering practice. It further focuses on strengthening practical and discipline-specific skills related to the engineering workplace through applied activities and real-life case studies, in collaboration with industry experts, in order to provide a learning experience aligned with current market needs. The course aims to build students' professional readiness and help them understand their roles and responsibilities in the workplace, thereby enhancing their ability to perform efficiently and confidently in diverse professional environments.
27412	Engineering Economics and Digital Applications
	Credit Hours: 3
	This course offers a comprehensive study of the principles and fundamental concepts of engineering economics, with a focus on the applications of modern digital technologies in the engineering field. It covers cost concepts, engineering decision-making processes, the time value of money, methods for evaluating engineering projects, and depreciation calculations. The course also emphasizes how digital technologies, such as automation, cloud computing, and the Internet of Things (IoT), can be used to enhance the economic analysis of engineering projects, reduce costs, increase efficiency, and improve investment decision-making. Furthermore, it examines the impact of digital transformation on economic feasibility assessment, risk management, and improved financial performance of engineering projects, while maintaining a balance between the economic and practical aspects of digital technologies.
20232	Engineering Mathematics (1)
	Credit Hours: 3
	Basic Concepts and Ideas of ODEs, First-order Differential Equations, Separable Equations, Exact Equations, Linear and Bernoulli Equations, Second-order and higher order ODEs, Homogeneous Equations with Constant Coefficients, Complex Roots, Euler-Cauchy Equation, Wronskian, Non-homogeneous Equations, Undetermined Coefficients, Variation of Parameters, Power Series Method, Theory of Power Series, Frobenius Method, Laplace

	Transforms and Tables, Applying Laplace Transforms to Solve ODEs, Convolution, Vectors and Matrices, Homogeneous Systems of ODEs, Nonhomogeneous Systems of ODEs, Solving Systems Using Eigenvalues and Laplace Transform.
20234	Linear Algebra
	Credit Hours: 3
	System of Linear Equations: Row-echelon Form, Gaussian Elimination, Gauss-Jordan Method; Matrix: Operations, Properties of Matrix Arithmetic, Matrix Transpose, Special Matrices; Determinants: Properties of Determinants, The Method of Cofactors, Adjoint Matrix and Inverse of a Matrix, Cramer's Rule; Euclidean n-space: Vectors, Dot Product, Cross Product, Euclidean n-space, Linear Transformations; Vector Spaces: Vector Spaces, Subspaces, Span, Basis and Dimensions, Fundamental Subspaces, Inner Product Spaces, Orthogonal and Orthonormal Basis, Least Squares, QR- decomposition, Orthogonal Matrices; Eigenvalues and Eigenvectors: Eigenvalues and Eigenvectors, Diagonalization. Linear Transformations: General Linear Transformations, Kernel and Range.
20243	Solid State Physics
	Credit Hours: 3
	The crystal structure of solids. Introduction to the quantum mechanics of solids: Heisenberg's uncertainty principle, the Schrodinger equation, the free electron problem, the step potential, the Kronig-Penney model, the simple harmonic oscillator. Introduction to the quantum theory of solids: the Fermi-Dirac distribution function. Introduction to semiconductor physics: carrier transport in semiconductors. Introduction to semiconductor diodes. Introduction to the bipolar junction transistor. Introduction to the field-effect transistor.
20331	Engineering Mathematics (2)
	Credit Hours: 3
	Vector Fields, Divergence of a Vector Field, Curl of a Vector Field, Line integrals, Path Independence of Line Integral, Green's Theorem in The Plane, Surface Integrals, Divergence Theorem for Gauss, Stoke's Theorem, Fourier Series, Functions of Any Period, Even and Odd Extensions, Fourier Integral, Fourier Transforms; PDEs: Basic Concepts; Modeling: Vibrating

	String, Wave Equation, Separation of Variables, One-dimensional Heat Equation; Heat Equation: Solution by Fourier Transforms, Laplacian in Polar Coordinates, Laplace's Equation in Cylindrical and Spherical Coordinates, Solution by Laplace Transform.
20333	Numerical Analysis
	Credit Hours: 3
	Error Analysis, Iterative Methods for Solving Linear and Nonlinear Equations of One Variable, System of Linear Algebraic Equations, Direct Methods for Solving Linear Systems, Iterative Methods for Solving Linear and Nonlinear Systems of Equations, Interpolation and Approximation, Introduction to Numerical Differentiation and Integration, Numerical Methods for Solving Initial Value Problem.
20335	Applied Probability and Statistics
	Credit Hours: 3
	Introduction to Descriptive Statistics: Measures of Central Tendency, Measures of Dispersion, Measures of Position, and Graphical and Tabular Displays; Introduction to Inferential Statistics: Point Estimate, Confidence Interval and Hypothesis Testing; Basic Probability and Set Theory, Conditional Probability and Independence, Random Variables and Moments, Special Probability Distributions (Discrete and Continuous Distributions), Multiple Random Variables, Covariance and Correlation Coefficient, Functions of Random Variables, Transforms and Moment Generating Function, Practical Applications.
20334	Applied Probability
	Credit Hours: 3
	Probability principles and set theory. Random variables. Operations on random variables. Various distribution functions. Introduction to random processes. Weak stationary. Correlation functions, linear processing, and estimation. Poisson processes and Markov chains. Queuing analysis.
	Electric Circuits (1)
	Credit Hours: 3

21221	Types of circuits and circuit elements. Revision of Ohm's and Kirchhoff's Laws. Circuit analysis techniques: voltage and current division, nodal and mesh analysis, source transformation, superposition, Thevenin's and Norton's theorems. Inductance and capacitance. Source-free RL and RC circuits. Applications of the step forcing function. The RLC circuit: source-free parallel and series RLC and complete response. Sinusoidal forcing function. Phasor concept.
21222	Electric Circuits (2)
	Credit Hours: 3
	The sinusoidal steady state response: application of phasor concept and circuit analysis techniques AC circuits. Average power and RMS values. Types of Electrical Machines. Poly-phase circuits: three phase (Y) and (Δ) connection. Complex frequency. Frequency response and Bode plot. Magnetically coupled circuits. Two-port networks.
21229	Electric Circuits Lab
	Credit Hours: 1
	DC circuit: Kirchhoff's laws and mesh analysis. Thevenin's and Norton's theorems. Superposition theorem. Wheatstone bridge. Transient response: RL, RC, and RLC circuits. AC circuits: impedance concept, frequency response, three-phase circuits. Y- Δ transformation. Maximum power transfer. Two-port networks.
21231	Electronics (1)
	Credit Hours: 3
	Basic semiconductor concepts. Diodes: DC and AC analysis, special type diodes. Theory of Bipolar Junction Transistors (BJT): biasing techniques, BJT amplifier analysis. Field Effect Transistors (FET): biasing techniques, FET amplifier. Simple applications of BJT's and FET's.
21331	Electronics (2)
	Credit Hours: 3
	Operational amplifiers: basic theory, characteristics and applications. MOSFET current mirrors. Differential and multistage amplifiers. Frequency response of single and multistage CMOS amplifiers. Negative feedback analysis: feedback topology, properties and stability analysis. Operational amplifier design and simulation project.

21332	Digital Electronics
	Credit Hours: 3
	This course introduces the fundamental principles of modern digital electronic circuits with emphasis on CMOS-based design and implementation. Topics include digital logic families and their electrical behavior, MOS transistor fundamentals, CMOS inverter operation, and the design of CMOS combinational logic circuits such as NAND, NOR, and complex gates, including timing considerations. The course also covers static and dynamic power in digital circuits, sequential building blocks such as latches, flip-flops, and registers, memory structures including RAM and ROM, propagation delay and timing concepts in digital systems, basics of physical design, data converters such as ADCs and DACs, finite state machines (FSMs), and monostable circuits and digital oscillators. The course emphasizes analysis, design, and performance trade-offs in digital integrated circuits and provides the foundation for advanced study in VLSI, digital system design, and computer hardware.
21338	Electronics Lab
	Credit Hours: 1
	Diode characteristics and applications. BJT characteristics and DC biasing. FET characteristics and DC biasing. BJT amplifiers. Operational amplifiers. Multistage amplifiers. Differential amplifiers. Frequency response. Feedback techniques.
21339	Digital Electronics Lab
	Credit Hours: 1
	This laboratory course provides practical experience in the analysis, design, simulation, and implementation of digital electronic circuits with emphasis on CMOS-based systems using industry-standard EDA tools, including Synopsys-based tools. Experiments cover CMOS transistors and logic characteristics, CMOS inverter logic characteristics, and CMOS layout design, enabling students to relate device-level behavior to circuit performance. The laboratory also includes work on the 555 timer, analog-to-digital and digital-to-analog converters, combinational circuit design and layout, sequential circuit design using latches and flip-flops, and the operation of pseudo-NMOS and dynamic gates. The course emphasizes hands-on skills in circuit realization, measurement, timing analysis, and tool-based physical

	design and layout using industry-standard EDA environments, including Synopsys-based tools, and supports the theoretical concepts presented in Digital Electronics.
21348	Scripting Languages Lab
	Credit Hours: 1
	This laboratory introduces students to scripting languages used in Linux/Unix environments, with emphasis on Perl, Tcl/Tk, and Bash. Students learn how to create scripts, use basic Unix commands, and apply the main principles of scripting languages. The laboratory covers common scripting concepts in Perl and Tcl/Tk, including data types, control structures and operators, functions and commands, standard input/output, file reading and writing, subroutines and procedures, regular expressions, modules and packages, and basic Tk graphics. The laboratory also highlights the use of scripting languages in Electronic Design Automation and IC design flow.
21431	Communication Electronics
	Credit Hours: 3
	Power amplifiers: classification of output stage A, B, C, and AB. Efficiency analysis of power amplifiers and basic techniques in heat sink design. Tuned amplifier: theory and design. Oscillators: LC and crystal oscillators. Modulation and demodulation circuits and synthesizers. Phase-Locked Loop (PLL): theory and design. Active and passive filters.
21432	Optical Electronics
	Credit Hours: 3
	Semiconductor concepts and energy bands. Direct and indirect bandgap semiconductors. PN junction principles. The PN junction band diagram. Light-Emitting Diodes. LED materials. Hetrojunction high intensity LEDs. LED characteristics. LED for optical fiber communications. Introduction to LASER stimulated emission devices. Photodetectors. Photovoltaic devices. Principles of fiber-optic communication links.
21434	Analog IC Design
	Credit Hours: 3

	Basic analog circuits blocks: reference bias circuits, comparators, operational amplifiers and sample-and-hold amplifiers. Concepts of stability, bandwidth, gain bandwidth product, frequency response and gain response. Switched-capacitors circuit techniques. Integrated circuit analog-to-digital converters and topologies: flash, pipeline, and successive rate approximation. Digital-to-analog convertors: current mode and resistor ladder topologies. Concepts of resolution and speed for data convertors. Filter design techniques using operational amplifiers and GmC based integrated circuits. Concepts of bandwidth, filter order, and stability.
21439	Communication Electronics Lab
	Credit Hours: 1
	Power amplifier. Oscillators. Modulation and demodulation circuits. Phase Locked Loop (PLL) circuits. Active filters.
21471	Robotic Systems
	Credit Hours: 3
	This course introduces the fundamental principles of modern robotics, focusing on the mathematical, mechanical, and computational foundations required to analyze and control robotic systems. Students explore manipulator anatomy, spatial transformations, Denavit–Hartenberg and product of exponential (POE) modeling, and forward and inverse kinematics. The course progresses to differential kinematics, Jacobians, robot dynamics, classical and advanced control methods, mobile robot models, path planning, and trajectory generation. Throughout the semester, students connect theory to real-world applications and basic robot programming, forming a solid foundation for more advanced robotics courses.
21490	Practical Training
	Credit Hours: 3
	Grade: Pass/Fail
	Students undertake suitable and supervised internships for a period of 8 consecutive weeks in Jordan, or 6 consecutive weeks outside.
21531	Very Large Scale Integrated (VLSI) Circuits
	Credit Hours: 3

	This course covers advanced topics in very-large-scale integrated (VLSI) circuit design, with emphasis on the analysis, implementation, and verification of modern digital integrated systems. Topics include nonideal transistor behavior, logical effort, wires and scaling effects, and common design pitfalls and reliability issues in nanoscale technologies. The course also introduces SystemVerilog and RTL design, verification basics, and logic synthesis as essential components of contemporary digital design flow. Additional topics include datapath design, system-level timing analysis, and design for testability (DFT). The course emphasizes the relationship between circuit theory, digital design methodology, and practical implementation considerations, and prepares students for advanced work in VLSI system design and verification.
21572	Industrial Electronics
	Credit Hours: 3
	DC & AC bridges. Ammeters. Voltmeters. Power measurements and power meters. Loading effects. Sensors: thermal, mechanical, optical. Relay controllers and ladder diagrams. Analog controllers (P), (PI) and (PID). Digital and Programmable Logic Controllers.
21574	Medical Electronics
	Credit Hours: 3
	Basic sensors. Bio-potential signals. Bio-potential amplifier circuits. Blood pressure measurements. Heart sound measurements. Blood flow measurements. Respiratory system measurements. Clinical laboratory instrumentation. Therapeutic and prosthetic devices. Introduction to medical imaging systems. Four practical lab experiments.
21579	Industrial Electronics Lab
	Credit Hours: 1
	Experiments covering: Analysis and measurement of various sensing circuits; including RTD, thermistor, thermocouple, IC temperature sensor, strain gauge, ultrasonic, capacitive, and infra- red sensors. Programmable Logic Controller application.
21575	Industrial Electronics & Measurement Systems
	Credit Hours: 3

	This course introduces the basic concepts of industrial electronics and modern measurement instrumentation techniques. It covers selected topics in industrial electronics and measurement: Signal Conditioning, Temperature Measurement Sensors, Pressure Measurement Sensors, Mechanical motion measurement sensors (LVDT & Strain Gauges), Bridge Circuits, ADCs, DACs, Op-Amps, DIACS, TRIACS, and Programmable Logic Controllers. It also allows students to design various signal conditioning circuits used in industry. It also introduces basic concepts of Programmable Logic controllers and Ladder diagrams.
21576	Industrial Electronics & Measurement Systems Lab
	Credit Hours: 1
	Experiments covering: Analysis and measurement of various sensing circuits, including RTD, thermistor, thermocouple, IC temperature sensor, strain gauge, ultrasonic, capacitive, and infrared sensors. Programmable Logic Controller application.
21577	Robotics Lab
	Credit Hours: 1
	This laboratory course provides hands-on experience with the fundamental concepts of robotics through progressive practical exercises that reinforce the theory taught in the companion lectures. Students begin by developing algorithmic thinking and pseudocode skills, then learn to program robotic motion using Blockly and simulation tools. The course advances into computational forward and inverse kinematics, mobile robot modeling, and PID control through MATLAB/Python simulations. Students subsequently apply these principles to real robotic systems through pick-and-place operations, conveyor sensing, palletizing, and vision-based sorting. The lab concludes in an integrated automation project combining perception, sensing, motion planning, and manipulation.
21591	Senior Design Project (1)
	Credit Hours: 1
	Grade: Pass/Fail
	Projects are aimed at developing independent engineering problem solving skills. A project should be performed by two or more students under the supervision of a faculty member.
	Senior Design Project (2)

21592	Credit Hours: 2
	Continuation of Senior Design Project (1). Students are required to fulfill the project objectives, perform a formal presentation and submit a final report.
22210	Programming Applications Lab
	Credit Hours: 1
	The course provides an introduction to the MATLAB computing environment and gives students a basic understanding of MATLAB programming and popular Simulink toolboxes. It covers basic commands in MatLab, such as arithmetic operations, arrays, loops, logic control, and data types and format. It also covers various applications in engineering including control, signal processing, and others using Simulink toolboxes. The course is offered in the form of laboratory sessions (theory and experiments).
23356	Programming Applications in Signals and Systems Lab
	Credit Hours: 1
	Introduction to MATLAB. The MATLAB based experiments cover the following topics: Linear time invariant systems (LTI), frequency domain representation of signals and systems, and design and analysis of Filters. Practical applications will be given along with the lab experiments.
23352	Programming Applications in Signals and Systems
	Credit Hours: 1
	Introduction to MATLAB. Using MATLAB in signals and systems. Signal generation and the convolution process. Fourier series. Laplace and Fourier transforms. Transient and steady state response. Filter design. Discrete signals: Z- transform and frequency domain analysis.
22241	Digital Logic Design
	Credit Hours: 3
	Number systems. Basic gates and logic functions. Boolean algebra, Boolean expressions. Logic minimization techniques. Combinational logic building blocks: decoders, encoders, multiplexers, demultiplexers and magnitude comparators. Digital arithmetic: adders and

	subtractors. Basics of sequential circuits: latches and flip-flops. Timing diagrams. Counters and shift registers. Basic PLDs, CPLDs and FPGAs. State machines. System design with state machines using HDL. Memory devices and systems: RAM, ROM, FIFO, LIFO and DRAM.
22271	Artificial Intelligence & Data Analytics in Engineering
	Credit Hours: 3
	This course provides a comprehensive introduction to the fundamental principles, methodologies, and tools driving data science and Artificial Intelligence (AI). It introduces a core programming language and its principal libraries for data manipulation and AI applications, while guiding students through the main stages of the data pipeline, including data preprocessing, sampling, exploratory data analysis, feature engineering, and visualization techniques. Building on this analytical foundation, the course explores core machine learning concepts and provides students with a solid understanding of supervised and unsupervised learning algorithms.
22348	Digital Logic Lab
	Credit Hours: 1
	This lab introduces students to the fundamentals of designing and building digital circuits using hardware ICs as well as HDL. The lab includes an introduction HDL, and focuses on building combinational circuits such as parallel adder, multiplexers and decoders using HDL and hardware components. While the second part of the lab deals with building sequential circuits in hardware and describing them in HDL using behavioral modeling.
22347	Logic & Microprocessors Lab
	Credit Hours: 1
	Combinational logic circuits. Decoders and Multiplexers. ROM and RAM. Registers and Counters. Assembly language programming. Input/Output interfacing. Keyboard and 7-Segment display interfacing.
22442	Embedded Systems
	Credit Hours: 3
	Embedded systems characteristics. Microprocessors versus microcontrollers. Microcontrollers characteristics. General-purpose microcontrollers. Examples of microcontroller architectures.

	Interrupts. Counters/timers. Input/output ports. Microcontroller programming. Instruction set. Program development and use of assemblers. Memory maps and addressing modes. Digital to analogue and analogue to digital conversion in microcontrollers. Data acquisition and distribution. Serial and parallel communications. Real-time systems and its constraints. Interfacing to external devices. Power consumption consideration. Applications.
24301	Modeling & Simulation in Engineering Applications
	Credit Hours: 3
	This course introduces fundamental modeling and simulation methodologies. It equips students with the practical skills and techniques required to represent, analyze, and evaluate the behavior of various systems. Topics include mathematical modeling of dynamic systems using differential equations and state-space representations, and frequency-domain analysis. The course also covers the development of physics-based simulation models, fuzzy system modeling as well as numerical modeling techniques for solving complex problems. Through simulation-based studies and practical applications, students gain experience in predicting system behavior, validating designs, and evaluating solutions under realistic operating conditions using engineering simulation tools.
24401	Engineering Innovation & Tech Entrepreneurship
	Credit Hours: 3
	This course aims to develop students' knowledge, competencies, and practical skills in engineering innovation and technology entrepreneurship. The course covers a range of key topics, including the foundations of innovation and technology entrepreneurship, idea generation and development, multidisciplinary teamwork, market and customer analysis, business model design, business planning, intellectual property fundamentals, startup financing, prototype development, and the marketing and professional pitching of technology-based projects to relevant stakeholders.
24322	Instrumentation & Measurements
	Credit Hours: 3
	Measurements & error. Systems of units. Standards of measurements. Potentiometers. DC & AC bridges. DC & AC indicating instruments. Galvanometers. Electrodynamometers.

	Ammeters. Voltmeters. Wattmeters. Watthourmeters. Power factor meters. Basics of Digital Instruments. Loading effects. Ohmmeters. Meggers. Frequency counters. Oscilloscopes. Spectrum analyzers
24329	Instrumentation & Measurements Lab
	Credit Hours: 1
	Construction and use of potentiometers in DC & AC bridges. DC & AC indicating instruments. Shunts. Transformers & error measurements. Multimeters. Power measurements. Frequency meters & power supplies. Oscilloscopes.
24361	Electric Machines (1)
	Credit Hours: 3
	Basic elements of Power Systems. Magnetic Circuits: Parameters, relationships, equivalent circuit's representation, hysteresis and eddy current losses. Power Transformers: construction, principles and operation, ideal and practical transformer, determination of equivalent circuit parameters, voltage regulation, efficiency, all-day efficiency, three-phase power transformers, autotransformers, and per-unit system. Electromechanical energy conversion: Field energy, mechanical force in electromagnetic systems, rotating machines, cylindrical machines. DC machines: construction, classifications, DC generators, DC motors, Analysis of DC machines, speed control of DC motors, an introduction to AC machines.
24464	Machines & Electrical Power Systems
	Credit Hours: 3
	Per-unit system and applications. Transformer: single- and three-phase, ideal and practical, modeling and equivalent circuits. Synchronous machines. Single-line diagram. Y-bus and Z-bus matrices. Load flow analysis. Transmission lines: classification (short and long), for communications purposes. Calculations of R, L and C parameters. ABCD representation.
24467	Power Electronics
	Credit Hours: 3
	This course provides the students with foundation for the knowledge of the power semiconductor devices, their characteristics and operation. It also gives a deep understanding

	of power electronic circuits such as rectifiers, converters and inverters. Their analysis and some design aspects are also investigated.
24561	Power Electronics
	Credit Hours: 3
	Principles and methods of Electric power conversion (including waveform components, phase control and pulse width modulation), semiconductor power switches, supplementary components and systems (drivers, overcurrent protection schemes, snubbers and filters), AC-to- DC converters, AC-to- AC converters (including PWM AC voltage converters, cycloconverters and matrix converters), DC-to-DC converters, DC-to-AC converters (Inverters), switching power supplies, power Electronics for clean Energy (PV , Wind, Fuel cell and Electric and Hybrid cars).
24471	Automatic Control
	Credit Hours: 3
	Transfer Functions: block diagrams and signal flow graphs. Mathematical modeling of physical systems. State space representations. Control systems characteristics. Time response of systems and closed loop performance of second order systems. Stability and Routh-Hurwitz stability criterion. Root locus analysis. Nyquist stability criterion. Bode plots. Frequency domain analysis. Design of control systems.
24479	Automatic Control Lab
	Credit Hours: 1
	A set of experiments that cover the following: analog simulation, first and second order systems, transient and steady state for step, ramp, and parabolic inputs. Time and frequency response of second order systems. DC motor control. Application of PID controller, phase-lead, and phase- lag controllers. Level control. Applications using simulation software.
24568	Power Electronics Lab
	Credit Hours: 1
	Simulation: MATLAB Simulink and PSIM; Rectification: Controlled and uncontrolled single-phase half and full wave rectification; Three phase rectification; DC-DC conversion: buck and boost converters; Inversion: single phase and three phase inverters, Electric Drives.

23321 27321	Electromagnetics (1)
	Credit Hours: 3
	Review of coordinate systems and vector calculus. Electrostatic fields. Electric fields in material space. Magnetostatic fields. Magnetic fields in material space. Maxwell's equations.
24321	Applied Electromagnetics
	Credit Hours: 3
	Gauss' law. Divergence Theorem. Ampere's law. Biot-Savart law. Maxwell's equations and boundary conditions. Electromagnetic waves. Wave equations. Solutions in Cartesian coordinates. Solutions for partially conducting, good conducting and perfect dielectric mediums. Standing waves. Power and Poynting vector. Transmission lines, parameters, equations, input impedance, Standing Wave Ratio (SWR), power and Smith chart.
27353 23351	Signals and Systems
	Credit Hours: 3
	Classification of signals and systems. System modeling and time domain analysis. The Fourier series, the Fourier transform, and Laplace transform and applications. Frequency response and filter concepts. Signal transmission. Spectral analysis. Discrete-time signals and systems: classification of signals and systems. The Z-Transform and applications.
27356 23357	Communications (1)
	Credit Hours: 3
	Spectral densities. Correlation function. Power-bandwidth product. Distortion and distortionless channels. Analog modulation: DSB-SC, DSB-AM, SSB, Vestigial AM, modulator, demodulator: coherent, non-coherent. Angle modulation: FM, PM, modulator, demodulator. Base-band modulation: sampling theorem, PAM, PWM, PPM. Noise in analog communications: noise types, signal to noise ratio, the additive white Gaussian noise, signal interference.
23353	Analog Communications
	Credit Hours: 3

	Spectral densities. Correlation function. Power-bandwidth product. Distortion and distortionless channels. Analog modulation: DSB-SC, DSB-AM, SSB, Vestigial AM, modulator, demodulator: coherent, non-coherent. Angle modulation: FM, PM, modulator, demodulator. Base-band modulation: sampling theorem, PAM, PWM, PPM. Noise in analog communications: noise types, signal to noise ratio, the additive white Gaussian noise, signal interference.
27459 23357	Communications (2)
	Credit Hours: 3
	Base band digital modulation techniques: PCM, DM, D-Σ, and DPCM. Line coding. Intersymbol interference: M-ary signaling, bandwidth, data rate. Multiplexing: FDM, TDM, CDM. Passband digital modulation and demodulation techniques: ASK, FSK, PSK, DPSK, M-ary, coherent and non-coherent detection. Bit error rate performance. Channel coding theory: convolution coding, block codes. Error performance using coding.
23451	Digital Communications
	Credit Hours: 3
	Base band digital modulation techniques: PCM, DM, D-Σ, and DPCM. Line coding. Intersymbol interference: M-ary signaling, bandwidth, data rate. Multiplexing: FDM, TDM, CDM. Passband digital modulation and demodulation techniques: ASK, FSK, PSK, DPSK, M-ary, coherent and non-coherent detection. Bit error rate performance. Channel coding theory: convolution coding, block codes. Error performance using coding.
27456 23459	Communications Lab
	Credit Hours: 1
	Spectral analysis. Amplitude modulation. Frequency modulation: phase shift keying, amplitude shift keying, frequency shift keying. TDMA. FDMA. Lab project.
27355	Communication Principles
	Credit Hours: 3
	Transmission through a Linear System. Amplitude, Frequency and Phase Modulation and Demodulation. Sampling Theorem, A/D conversion, Line Coding and M-ary. Baseband

	Transmission: PAM, PPM, PWM, PCM. Multiplexing Techniques: TDM, FDM and CDM. Digital Modulation and Demodulation Techniques: QAM, ASK, PSK and FSK.
27550 23571	Digital Signal Processing
	Credit Hours: 3
	Discrete-time signals and systems. Frequency analysis of discrete-time signals and systems. Sampling and quantization. Discrete Fourier transform. Windowing effect. Z-transform. FIR and IIR Digital filters design. Digital filters realization. Fast Fourier transform.
11206	Object Oriented Programming
	Credit Hours: 3
	The course aims to introduce object-oriented programming concepts and paradigms. Topics include: Data abstraction, encapsulation and information hiding, classes attribute and methods, inheritance, polymorphism, and operator overloading. At the end of the course, students expected to be able to solve computing problems using object-oriented principles including information hiding, inheritance, and polymorphism.
20242	Materials Physics and Chemistry for Engineers
	Credit Hours: 3
	The Crystal Structure of Solids and Crystal Defects, Bonding in Solids, Polymers, Electronic Theory of Solids, Superconductivity, Magnetism in Matter, Optical Properties of Materials and Optical Devices, Basic Concepts in Nano Structures and Thin Films.
21533	RF Microelectronics
	Credit Hours: 3
	Communication systems overview. Transceiver architectures. S-parameters and impedance transformers. MOS transistors, passive components and gain-bandwidth issues for broadband amplifiers. High frequency broadband amplifiers. Low-noise amplifiers. Voltage controlled oscillators. Mixers. Power amplifiers: class 'A', 'B' and 'C'. Advanced RF topics
	Mixed Signal IC Design
	Credit Hours: 3

21534	Introduction to data communications IC design terminology, signal integrity and signaling conventions. Data transmission media and noise sources. Transistor-level design techniques for timing circuits: phase-locked loops, delay-locked loops, clock and data recovery. Phase-locked loops components: phase/frequency detectors, charge pumps and voltage-controlled oscillators. Interface, signal conditioning and wave shaping techniques. Current mode and voltage mode drivers. Transceiver analysis and design. Concepts of power, speed, and signal integrity.
21535	Solid State Electronics
	Credit Hours: 3
	The crystal structure of solids. Introduction to the quantum mechanics of solids: Heisenberg's uncertainty principle, the Schrodinger equation, the free electron problem, the step potential, the Kronig-Penney model, the simple harmonic oscillator. Introduction to the quantum theory of solids: the Fermi-Dirac distribution function. Introduction to semiconductor physics: carrier transport in semiconductors. Introduction to semiconductor diodes. Introduction to the bipolar junction transistor. Introduction to the field-effect transistor.
21536	Analog IC Design
	Credit Hours: 3
	Basic analog circuits blocks: reference bias circuits, comparators, operational amplifiers and sample-and-hold amplifiers. Concepts of stability, bandwidth, gain bandwidth product, frequency response and gain response. Switched-capacitors circuit techniques. Integrated circuit analog-to-digital converters and topologies: flash, pipeline, and successive rate approximation. Digital-to-analog convertors: current mode and resistor ladder topologies. Concepts of resolution and speed for data convertors. Filter design techniques using operational amplifiers and GmC based integrated circuits. Concepts of bandwidth, filter order, and stability.
21573	Image Processing
	Credit Hours: 3

	Enhancement in the spatial domain. Image enhancement in the frequency domain. Image restoration. Color image processing. Wavelets. Image compression. Morphological image processing. Image segmentation.
21441	Engineering Fundamentals for Aviation
	Credit Hours: 3
	This course provides the foundational scientific and engineering principles required for aviation systems. It covers applied mathematics for technical problem solving, fundamental physics concepts including mechanics, thermodynamics, waves, and the properties and applications of engineering materials used in aircraft structures. The course also introduces basic aerodynamic principles such as lift, drag, airflow behavior, and aircraft stability. Emphasis is placed on building analytical skills and understanding the physical behavior of systems relevant to aviation engineering.
21442	Avionics and Aircraft Electronic Systems
	Credit Hours: 3
	This course develops a comprehensive understanding of electrical, electronic, and digital systems used in modern aviation. It covers electrical circuit theory, DC/AC systems, and electromagnetic principles, followed by semiconductor devices, analog circuits, and operational amplifiers. The course further introduces digital systems, including logic circuits, microprocessors, data communication, and embedded electronic information systems (EIS). Emphasis is placed on system-level understanding, signal processing, and the integration of hardware and software in avionics applications.
21443	Aircraft Systems, Maintenance, and Regulations
	Credit Hours: 3
	This course focuses on aircraft systems, maintenance procedures, and operational frameworks within the aviation industry. It covers aircraft structures, onboard systems (communication, navigation, hydraulics, environmental systems), and propulsion systems. The course also addresses maintenance practices, including inspection, repair, and safety procedures, alongside regulatory requirements governing airworthiness and maintenance organizations. Human factors in aviation are emphasized to enhance safety, decision-making, and teamwork.

	The course prepares students for real-world aviation environments by integrating technical knowledge with regulatory and operational considerations.
21541	Low Power IC Design / PMIC
	Credit Hours: 3
	This course introduces the principles and design of integrated circuits used in power management applications. Topics include the fundamentals of power management ICs, low-dropout (LDO) regulators, switching-mode power-supply converters such as buck and boost converters, LED drivers, and analog and digital control techniques for power supplies. The course also covers voltage-mode and current-mode control, power-supply drivers, and selected advanced topics in power-management circuit design. In addition, the course introduces low-power IC design considerations, energy-efficient circuit techniques, and design trade-offs involved in reducing power consumption in integrated circuits. Emphasis is placed on the analysis, design, and application of efficient integrated power-conversion and regulation circuits in modern electronic systems.
21542	RF IC Design
	Credit Hours: 3
	Communication systems overview. Transceiver architectures. S-parameters and impedance transformers. MOS transistors, passive components and gain-bandwidth issues for broadband amplifiers. High frequency broadband amplifiers. Low-noise amplifiers. Voltage controlled oscillators. Mixers. Power amplifiers: class 'A', 'B' and 'C'. Advanced RF topics.
21543	EDA tools for IC design
	Credit Hours: 3
	This course introduces the front-end electronic design automation (EDA) tools and design flow used in modern digital integrated circuit design. Topics include the digital design flow from specification and design description to logic simulation, logic synthesis, formal verification, and static timing analysis. The course also covers design constraints, operating conditions, timing closure, and optimization trade-offs in digital IC implementation. Laboratory work provides practical experience with front-end digital IC design using industry-standard Synopsys tools for simulation, synthesis, verification, and timing analysis.

21544	Chip Design Verification
	Credit Hours: 3
	This course builds on prior knowledge of RTL design, SystemVerilog, and basic testbenches to introduce advanced verification methodologies for digital systems and integrated circuits. It focuses on structured and coverage-driven verification techniques, including constrained-random stimulus generation, functional coverage, and assertion-based verification. Students learn to develop reusable verification environments for combinational and sequential designs, datapath components, and finite state machines, and are introduced to industry-standard methodologies and tools such as the Universal Verification Methodology (UVM).
21545	AI and Machine Learning in Chip Design
	Credit Hours: 3
	This course introduces the application of artificial intelligence and machine learning techniques in chip design and design automation. Topics include design space exploration, circuit optimization, timing and power prediction, placement and routing assistance, yield improvement, fault analysis, and data-driven design methodologies. The course also introduces relevant artificial intelligence and machine learning methods, infrastructure and deployment considerations, and emerging challenges in AI-enabled semiconductor design workflows. It emphasizes the growing role of intelligent methods in modern chip design and electronic design automation.
21581	Special Topics in Electronics Engineering
	Credit Hours: 3
	The objective of this course is to introduce advanced and new topics in one of the areas of electronics engineering. The topics can be changed from one year to another depending on the instructor's area of specialty.
22320	Computer Architecture (1)
	Credit Hours: 3
	Register transfer & micro-operations. Design of arithmetic logic unit. Computer Instructions. " .Number representations and computer arithmetic. Computer organization and components Processor design: data-path and control units. Instruction cycle. Pipelining."

22444	Computer Architecture & Organization (1)
	Credit Hours: 3
	Register transfer & microoperations. Design of arithmetic logic unit. Computer Instructions. Number representations and computer arithmetic. Computer organization and components. Processor design: datapath and control units. Instruction cycle. Pipelining.
22321	Computer Architecture (2)
	Credit Hours: 3
	Technology trends. Computer performance: CPU time equation, benchmarks, die cost, power and Amdahl's law. Instruction-level parallelism: pipeline review, pipeline hazards, superscalar processors, static multiple issue, VLIW, dynamic scheduling, speculative execution and branch prediction. Memory hierarchy: caches, cache performance, advanced cache designs, memory organization and virtual memory. Storage and I/O: performance, disk storage, flash storage, system and I/O busses and RAID. Parallel computers: shared-memory multiprocessors, coherence protocols, NUMA, message passing, clusters, multithreading and multicore processors.
22344	Microprocessors
	Credit Hours: 3
	Assembly language instruction set. Addressing modes. Arithmetic instructions. Logical and bit manipulating instruction. I/O instructions. Microprocessor pin out and timing diagram. Address decoding circuits. Memory interfacing. Input output interfacing. Serial and parallel communications. Counter and timers. Interrupts. DMA controllers.
22582	Special Topics in Computer Engineering (1)
	Credit Hours: 3
	The objective of this course is to introduce advanced and new topics in one of the areas of computer engineering. The topics can be changed from one year to another depending on the instructor's area of specialty.
22581	Special Topics in Computer Engineering
	Credit Hours: 3

	The objective of this course is to introduce advanced and new topics in one of the areas of computer engineering. The topics can be changed from one year to another depending on the instructor's area of specialty.
24573	Digital Control
	Credit Hours: 3
	Discrete-time systems. Difference equations. Z-transform. Inverse Z-transform. Flow graphs. State variables. Transfer functions. Sampling and reconstruction of control systems. Zero-order and first-order hold. System time response characteristics. Stability analysis. Bi-linear transform. Jury's stability test. Pole assignment and state estimation. Controllability and observability. Ackerman's formula. Linear quadratic optimal control.
24583	Special Topics in Power &Energy Engineering
	Credit Hours: 3
	The objective of this course is to introduce advanced and new topics in one of the areas of Energy and Power engineering. The topics can be changed from one year to another depending on the instructor's area of specialty.
24581	Special Topics in Power Engineering
	Credit Hours: 3
	The objective of this course is to introduce advanced and new topics in one of the areas of Power engineering. The topics can be changed from one year to another depending on the instructor's area of specialty.
25593	Special Topics in Network Security Engineering (1)
	Credit Hours: 3
	The objective of this course is to introduce advanced and new topics in one of the areas of Network Security Engineering. The topics can be changed from one year to another depending on the instructor's area of specialty.
23582	Special Topics in Communications Engineering (1)
	Credit Hours: 3

	The objective of this course is to introduce advanced and new topics in one of the areas of Communications engineering. The topics can be changed from one year to another depending on the instructor’s area of specialty.
27582	Special Topics in Communications Engineering
	Credit Hours: 3
	The objective of this course is to introduce advanced and new topics in one of the areas of Communications engineering. The topics can be changed from one year to another depending on the instructor’s area of specialty.
23581	Special Topics in Communications Engineering
	Credit Hours: 3
	The objective of this course is to introduce advanced and new topics in one of the areas of Communications engineering. The topics can be changed from one year to another depending on the instructor’s area of specialty.