

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COs

1st Semester

ETMA 101	Applied Mathematics I
	Upon completion of the course, the students will be able to:
CO1	Introduce the concept of infinite series and their application in signal processing and vibration.
CO2	Identify the curve and determine its length and area. Study includes finding volume and surface area as well.
CO3	Analyze the rank of the matrix and implement it to find the solution of system of linear equations.
CO4	Develop an understanding of finding the solution of LDE with Bessel and Legendre Equations in particular.

ETPH 103	Applied Physics I
	Upon completion of the course, the students will be able to:
CO1	Understand the concepts of Interference, Diffraction and Polarization of Light waves.
CO2	Explain the role of Fibers and Lasers in communication system.
CO3	Understand the concept of special theory of Relativity
CO4	Make use of the knowledge of Nuclear Physics to explain Energy issues and material detectors.

ETME-105	Manufacturing Process
	Upon completion of the course, the students will be able to:
CO1	Illustrate different manufacturing processes properties and applications of different ferrous and non-ferrous materials and classification of different heat treatment and casting processes along with their advantages & applications.
CO2	Compare between hot working and cold working processes e.g. forging, extrusion and fitting and their merits.
CO3	Comprehend different types of joining processes like welding, soldering, brazing and their applications
CO4	Explain different sheet metal processes and steps for making products through powder metallurgy.

ETEE - 107	Electrical Technology
	Upon completion of the course, the students will be able to:
CO1	Define and demonstrate the various theorems and their applications to the analysis of DC circuits.
CO2	Develop an understanding of AC fundamentals, RLC circuits and 3-phase circuits.
CO3	Examine the basics of measuring instruments and working of various types of wattmeter and energy meters.
CO4	Perceive the importance of a single phase transformer and classify the various types of motors.

ETHS- 109	Human Values and Professional Ethics-I
	Upon completion of the course, the students will be able to:
CO1	Interpret the essence of value education and ethics in correlation to engineering discipline.
CO2	Identify and analyze the harmonious relationship of an individual with family, society, nation and nature.
CO3	Define the importance of ethical human conduct and obligation of engineering professionals towards people-friendly and eco-friendly development.
CO4	Develop themselves into valuable professionals and distinguish between ethical and unethical practices of engineering profession.

ETCS 111	Fundamental of Computing
	Upon completion of the course, the students will be able to:
CO1	Understand the five component model of a computer with its components.
CO2	Describe the different operating system(DOS,Windows,Linux) and DBMS with its supporting utilities.
CO3	Discuss the concept of flowchart and apply it to real world Problems
CO4	To study and analyze the fundamental concepts of computer networking
CO5	To study and use Libre Office.

ETCH 113	Applied Chemistry
	Upon completion of the course, the students will be able to:
CO1	Identify modern techniques and tools for efficient utilization of fuels & catalysts in industries.
CO2	Explain the existence of equilibrium between different phases and application of phase rule in phase separation and metal extraction.
CO3	Apply the knowledge of water analysis to design new systems of water purification.
CO4	Illustrate corrosion preventing techniques and apply its principles to manage corrosion related problems.

ETPH-151	Applied Physics Lab I
	Upon completion of the course, the students will be able to:
CO1	Define the least count of various measuring Instruments.
CO2	Explain the mechanism of generation of various lights and compare their properties.
CO3	Demonstrate the various optical phenomenon and classify them.
CO4	Design and develop a project using optical phenomenon.

ETME - 155	Workshop Practice
	Upon completion of the course, the students will be able to:
CO1	Identify Tools Used In Mechanical Workshop(Name and Function).
CO2	Prepare Welding joints using Arc and Spot Welding.
CO3	Prepare Sand Mould in Foundry Shop.
CO4	Perform operations by producing various sheet metal objects.
CO5	Perform fitting operations by producing various fitting Jobs.

ETME - 157	Engineering Graphics lab
	Upon completion of the course, the students will be able to:
CO1	Classify dimensioning and List the type of lines.
CO2	Demonstrate and Draw the projection of points and Lines.
CO3	Construct the projection of Planes in various orientations.
CO4	Imagine simple solids and creating projections.
CO5	Utilize the knowledge of Engineering Graphics for making Orthographic and Isometric Projection.

ETCS 157	Fundamental of Computing Lab
	Upon completion of the course, the students will be able to:
CO1	Recognize and analyze installation, configuration, functioning of computer hardware and software
CO2	Visualize and installation of computer registry and rpm and Debian based packages.
CO3	Understand and work in command line interface with Dos and Linux Commands.
CO4	Draw and verify flowchart using DIA.
CO5	Explore word processing spreadsheets and presentation software to solve basic system problems.

ETCH 161	Applied Chemistry Lab
	Upon completion of the course, the students will be able to:
CO1	Make use of volumetric and instrumental methods to analyze samples.
CO2	Determine and interpret the properties of different liquid samples.
CO3	Apply pathways for different reactions to investigate industrial problems.
CO4	Utilize experimental skills logically in research and training programs.

2nd Semester

ETMA 102	Applied Mathematics II
	Upon completion of the course, the students will be able to:
CO1	To deal with functions of several variables that are essential in most branches of engineering.
CO2	Develop skills to formulate and solve different partial differential equations arising in physical modeling of various phenomenon.
CO3	Making use of complex functions, analytic functions, complex integration and residues.
CO4	Illustrate the concept of Green's theorem , Stokes theorem and Divergence theorem.

ETPH 104	Applied Physics II
	Upon completion of the course, the students will be able to:
CO1	Explain propagation of electromagnetic waves in different media.
CO2	Understand the basic quantum mechanics and its applications.
CO3	Understand crystallography & its applications in semiconductor devices.
CO4	Explain band gap and Hall voltage in semiconducting materials.

ETEC-106	Electronic Devices
	Upon completion of the course, the students will be able to:
CO1	Define the concepts of Electronics, associated semiconductor devices and application areas. Demonstrate the movement of charge carriers in semiconductors
CO2	Summarize various properties of a PN junction diode. Design and analyses special diodes and the circuits using these diodes for various applications.
CO3	Classify the concepts of various semiconductor transistors.
CO4	Design and analyse various circuits with different transistor configurations .Illustrate the basics of digital electronics, Boolean algebra and minimization techniques to analyse circuits using logic gates.

ETCS- 108	Introduction to Programming
	Upon completion of the course, the students will be able to:
CO1	Outline the problem solving technique with the basic understanding of programming language.
CO2	Design problems using loops and control statements.
CO3	Use the concept of pointers, arrays and structures in programs.
CO4	Do all construct modular programming using file handling, string function and enumerated data.

ETME 110	Engineering Mechanics
	Upon completion of the course, the students will be able to:
CO1	Draw the free body diagrams in static conditions and apply the concept of static equilibrium to some practical problems like trusses and friction.
CO2	Conversion of distributed force system into an equivalent point force system and apply it to the concept of moment of inertia.
CO3	Convert dynamic situations into an equivalent static situations and solve kinetics and kinematics of planer motion (Rectilinear and curvilinear) of a particle and rigid bodies by different forms of Newton's second law.
CO4	Visualize and interpret Shear force and Bending Moment Diagrams for engineering designs.

ETHS-112	Communication Skills
	Upon completion of the course, the students will be able to:
CO1	Compose grammatically correct expressions for appropriate oral and written communication in social and technical contexts.
CO2	Apply the usage of different words, expressions and idioms for effective interpersonal communication.
CO3	Comprehend, summarize and develop different types of texts, paragraphs and technical descriptions.
CO4	Analyze pragmatics embedded in the texts to develop critical abilities.

ETEN 114	Environmental Studies
	Upon completion of the course, the students will be able to:
CO1	Acquire the knowledge of multidisciplinary nature of environment & ecosystem for biodiversity conservation.
CO2	Make use of natural resources judiciously for sustainable development.
CO3	Apply the green chemistry principles and ecofriendly polymers to design various useful product synthesis.
CO4	Understand the causes and formulate the action plan during natural disasters.

ETPH 152	Applied Physics lab II
	Upon completion of the course, the students will be able to:
CO1	Measure the electrical properties of semiconductor materials and devices.
CO2	Explain the basic concept of passive electrical elements and circuits.
CO3	Demonstrate the effect of electricity and magnetism on charged particles.
CO4	Design and develop project based on the knowledge of electricity and magnetism.

ETCS 154	Programming Lab
	Upon completion of the course, the students will be able to:
CO1	To understand the basic of C programs like editor, linker, compiling and execution programs.
CO2	Recalling and executing the programs using concept of loops and control statements.
CO3	Describe the concept of arrays, structures and pointers.
CO4	Extend diversified solutions using various functions like string handling and file handling.

ETEC-156	Electronic Devices Lab
	Upon completion of the course, the students will be able to:
CO1	Use CRO, Multimeter and Function Generator. Analyse the characteristics of basic PN junction and zener diodes.
CO2	Understand the applications of diodes and create various circuits based on diodes.
CO3	Identify the characteristics of semiconductor bipolar and field effect transistors.
CO4	Demonstrate usage of integrated circuits (ICs) as components and verify the working of various logic gates. Implement the logic gate ICs as Boolean expressions for various applications.

ETME-158	Engineering Mechanics Lab
	Upon completion of the course, the students will be able to:
CO1	Verify of the law of force polygon.
CO2	Verify of law of moment.
CO3	Find Mechanical Advantage, Velocity Ratio and efficiency of various simple lifting machines.
CO4	Determine the coefficient of friction of inclined plane.

ETEN-160	Environmental Studies Lab
	Upon completion of the course, the students will be able to:
CO1	Analyze and determine the water pollution level in different samples to interpret data for environmental safety.
CO2	Transform raw materials into useful products safely & analyze their environmental related parameters.
CO3	Apply instrumental techniques in experiments to build an interdisciplinary approach in different fields of sciences.
CO4	Make use of chemical reaction for analytical, environmental and industrial management.