DEPARTMENT OF ENGINEERING SCIENCE

COURSE OUTCOMEs (2019 Pattern)

ACADEMIC YEAR: - 2019-2020

Department Vision

Engineering science department of MVPS'S KBT College of Engineering determines to become a centre of learning in the field of "sciences-in-engineering" and the development of human values to develop engineers those can apply basic knowledge in engineering field to serve society.

Department Mission

1. To produce graduates with strong knowledge of engineering sciences who are anchored on theprinciples of hard work and integrity.
2. To cultivate scientific culture with mathematical approach.
3. To solve the problems in engineering and improve it.

Program Outcomes

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

C101	**Engineering Mathematics-I**
	After completion of the course students will be able to -
C101.1	Compute expansion by Taylor's and Maclaurin's Series and apply L'Hospital rule to obtain limits.
C101.2	Find Fourier series representation and harmonic analysis for periodic continuous and discrete system.
C101.3	Calculate partial derivatives and their applications
C101.4	Compute maxima and minima, errors and check for functional dependence of functions
C101.5	Solve simultaneous linear equations by matrix method.
C101.6	Compute Eigen values , Eigen vectors and illustrate diagonalization

C102	**Engineering Physics**
	After completion of the course students will be able to -
C102.1	Use concepts of light (inference, diffraction) to demonstrate the application of Engineering.
C102.2	Explain basics of lasers and optical fibers and their use in some engineering applications.
C102.3	Apply the principles of quantum mechanics to find wave function of rigid box.
C102.4	Interpret Concepts of semiconductors and their applications in some semiconductor devices.
C102.5	Summarize basics of magnetism and superconductivity.
C102.6	Simplify concepts of physics for Non Destructive Testing. Learn some properties of Nanomaterials and their application

C103	**Systems in Mechanical Engineering**
	After completion of the course students will be able to -
C103.1	Describe and compare the conversion of energy from renewable and non-renewable energy sources.
C103.2	Explain basic laws of thermodynamics, heat transfer and their applications
C103.3	List down the types of road vehicles and their specifications
C103.4	Illustrate various basic parts and transmission system of a road vehicle
C103.5	Discuss several manufacturing processes and identify the suitable process
C103.6	To compare and select domestic appliances .

C104	**Basic Electrical Engineering**
	After completion of the course students will be able to -
C104.1	Differentiate between electrical and magnetic circuits and derive mathematical relation for self and mutual inductance along with coupling effect
C104.2	Calculate series and parallel capacitor as well as characteristics parameters of alternating quantity and phasor arithmetic
C104.3	Derive expression for impedance, current, power in series and parallel RLC circuit with AC supply along with phasor diagram.
C104.4	Relate phase and line electrical quantities in polyphase networks, demonstrate the operation of single phase transformer and calculate efficiency and regulation at different loading conditions
C104.5	Apply and analyze the resistive circuits using star-delta conversion KVL, KCL and different network theorems under DC supply
C104.6	Evaluate work, power, energy relations and suggest various batteries for different applications, concept of charging and discharging and depth of charge

C105	**Programming and Problem Solving**
	After completion of the course students will be able to -
C105.1	Discuss various skills in problem solving and programming.
C105.2	Demonstrate data types, input output statements, decision making statements, looping statements in python.
C105.3	Solve a problem by using functions and discuss modules in Python.
C105.4	Demonstrate various string operations.
C105.5	Apply object oriented programming features using Python.
C105.6	Use file handling in Python.

C106	**Workshop**
	After completion of the course students will be able to -
C106.1	To express the importance of safety in the workshop.
C106.2	To describe the construction, working and functions of Lathe, drilling, milling and grinding machine.
C106.3	Demonstrate and tackle various carpentry tools.
C106.4	Demonstrate and tackle various fitting tools.

C107	**Audit Course 1 (Environmental Studies- I)**
	After completion of the course students will be able to -
C107.1	Demonstrate an integrative approach to environmental issues with a focus on sustainability.
C107.2	Explain an inter-relationship and inter-dependency of the organism in different ecosystems.
C107.3	Distinguish between renewable and nonrenewable natural resources.
C107.4	Extract significance of biodiversity and its conservation.

C108	**Engineering Mathematics II**
	After completion of the course students will be able to -
C108.1	Solve ordinary differential equations of first order and first degree.
C108.2	Illustrate mathematical models of physical systems such as cooling of bodies, simple electrical circuits, rectilinear motion, heat loss.
C108.3	Solve integrals using reduction formula, beta and gamma function ,DUIS.
C108.4	Draw approximate shape of plane curve and measure its arc length using integration.
C108.5	Compute the equations of sphere, right circular cone and right circular cylinder.
C108.6	Compute the double and triple integrals and illustrate their applications such as area , volume , center of gravity , moment of inertia.

C109	**Engineering Chemistry**
	After completion of the course students will be able to -
C109.1	Apply the Hardness, alkalinity methods for analysis of water and techniques involved in softening of water as commodity
C109.2	Select electro-analytical method such as pH meter, Conductometry for material analysis
C109.3	Demonstrate the knowledge of advanced engineering materials such as polymer and nano materials for engineering applications
C109.4	Illustrate the solid, liquid and gaseous fuel and use of Power alcohol and biodiesel as alternative fuels.
C109.5	Indicate the chemical compounds based on their structure using UV-Visible and IR Spectroscopy
C109.6	Use appropriate preventive methods for minimizing corrosion

C110	**Basic Electronics Engineering**
	After completion of the course students will be able to -
C110.1	Determine the performance parameters of PN Junction rectifiers and compare with special purpose diodes.
C110.2	Compare BJT, MOSFET with OPAMP, calculate amplifiers gain for the given specification.
C110.3	Apply basic knowledge of logic gates to design and implement sequential and combinational logic circuits.
C110.4	Analyze the electronics laboratory instruments (analog and digital) used for experimentation and testing of electronic circuits.
C110.5	Select and compare the desired specifications of sensors and transducerfor a given measurement of a physical parameter.
C110.6	For the given specifications of communication system, describe modulation types, mobile communication system and determine the performance specifications such a modulation index.

C111	**Engineering Mechanics**
	After completion of the course students will be able to -
C111.1	Determine resultant of various force systems
C111.2	Determine centroid, moment of inertia and solve problems related to friction
C111.3	Determine reactions of beams, space forces using principles of equilibrium
C111.4	Solve trusses, frames and cables for finding member forces
C111.5	Calculate position, velocity and acceleration of particle using principles of kinematics
C111.6	Calculate position, velocity and acceleration of particle using principles of kinetics and Work, Power, Energy

C112	**Engineering Graphics**
	After completion of the course students will be able to -
C112.1	Draw the fundamental engineering objects using basic rules and able to construct the simple geometries.
C112.2	Draw fully-dimensioned 2D, 3D drawings using computer aided drafting tools.
C112.3	Construct the various engineering curves using the drawing instruments.
C112.4	Apply the concept of orthographic projection of an object to draw several 2D views and its sectional views for visualizing the physical state of the object.
C112.5	Apply the visualization skill to draw a simple isometric projection from given orthographic views precisely using drawing equipment.
C112.6	Draw the development of lateral surfaces for cut section of geometrical solids.

C113	**Project Based Learning**
	After completion of the course students will be able to -
C113.1	Project based learning will increase their capacity and learning through shared cognition.
C113.2	Draw on lessons from several disciplines and apply them in practical way
C113.3	Learning by doing approach in PBL will promote long-term retention of material and replicable skill, as well as improve teachers' and students' attitudes towards learning.

C114	**Audit Course 2 (Environmental Studies- II)**
	After completion of the course students will be able to -
C114.1	Explain various environmental pollutions and their potential solutions.
C114.2	Discuss global environmental effects and various environmental acts
C114.3	Explain natural disasters, impacts of human population growth on biosphere and role of humans in conservation of environment.
C114.4	Categorize flora and fauna, environmental pollutions, and simple ecosystems.