

## Institute of Engineering Department of First year Engineering

### Course Outcomes

| FE Common,<br>Course 2019                         | Cos       |   |
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| Course  |           |   |
| <b>107001</b><br><b>Engineering Mathematics I</b> | 107001.1  | Able to understand the Mean value theorems, Taylors and Maclaurin's series useful in the analysis of engineering problems.  |
|   | 107001.2  | Able to understand the Fourier series representation and harmonic analysis for design of periodic continuous and discrete systems.  |
|   | 107001.3  | Able to understand derivative of functions of several variables that are essential in various branches of Engineering.  |
|   | 107001.4  | Able to apply the concept of Jacobian to find partial derivative of implicit function and function dependence. Use of partial derivative in estimating error and approximation and finding extreme values of function.                              |
|   | 1007001.5 | Able to learn essential tool of matrices and linear algebra in a comprehensive manner for analysis of system of linear equations, finding linear and orthogonal transformations, Eigen values and Eigen vectors applicable to engineering problems. |
| <b>107002</b><br><b>Engineering Physics</b>       | 107002.1  | Able to understanding of interference, diffraction and polarization; connect it to few engineering applications.  |
|   | 107002.2  | Able to learn basics of lasers and optical fibers and their use in some applications.   |
|   | 107002.3  | Able to understand concepts and principles in quantum mechanics. Relate them to some applications.  |
|   | 107002.4  | Able to understand theory of semiconductors and their applications in some semiconductor devices.   |
|   | 107002.5  | Able to summarize basics of magnetism and superconductivity. Explore few of their technological applications.   |
|   | 107002.6  | Able to comprehend use of concepts of physics for Non Destructive Testing. Learn some properties of nonmaterial's and their application.  |

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| <b>102003</b><br><b>Systems in</b><br><b>Mechanical</b><br><b>Engineering</b> | 102003.1 | Able to describe and compare the conversion of energy from renewable and non-renewable energy sources.  |
|   | 102003.2 | Able to know basic laws of thermodynamics, heat transfer and their applications.  |
|   | 102003.3 | Able to list down the types of road vehicles and their specifications.  |
|   | 102003.4 | Able to Illustrate various basic parts and transmission system of a road vehicle.   |
|   | 102003.5 | Able to discuss several manufacturing processes and identify the suitable process.  |
|   | 102003.6 | Able to understand various types of mechanism and its application.  |
| <b>103004</b><br><b>Basic</b><br><b>Electrical</b><br><b>Engineering</b>      | 103004.1 | Able to differentiate between electrical and magnetic circuits and derive mathematical relation for self and mutual inductance along with coupling effect.  |
|   | 103004.2 | Able to calculate series, parallel and composite capacitor as well as characteristics parameters of alternating quantity and phasor arithmetic.   |
|   | 103004.3 | Able to derive expression for impedance, current, power in series and parallel RLC circuit with AC supply along with phasor diagram.  |
|   | 103004.4 | Able to 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. |
|   | 103004.5 | Able to apply and analyze the resistive circuits using star-delta conversion KVL, KCL and different network theorems under DC supply.   |
|   | 103004.6 | Able to Evaluate work, power, energy relations and suggest various batteries for different applications, concept of charging and discharging and depth of charge.   |
| <b>110005</b><br><b>Programming</b><br><b>and Problem</b><br><b>Solving</b>   | 110005.1 | Able to Inculcate and apply various skills in problem solving.  |
|   | 110005.2 | Able to choose most appropriate programming constructs and features to solve the problems in diversified domains.   |
|   | 110005.3 | Able to exhibit the programming skills for the problems those require the writing of well- documented programs including use of the logical constructs of language, Python.                               |
|   | 110005.4 | Able to demonstrate significant experience with the Python program development environment.   |

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| <b>111006</b><br><b>Work Shop Practice</b>         | 111006.1 | Familiar with safety norms to prevent any mishap in workshop.  |
|  | 111006.2 | Able to handle appropriate hand tool, cutting tool and machine tools to manufacture a job.   |
|  | 111006.3 | Able to understand the construction, working and functions of machine tools and their parts.   |
|  | 111006.4 | Able to know simple operations (Turning and Facing) on a centre lathe.   |
| <b>101007</b><br><b>Audit Course 1</b>             | 101007.1 | Able to demonstrate an integrative approach to environmental issues with a focus on sustainability.  |
|  | 101007.2 | Able to explain and identify the role of the organism in energy transfers in different ecosystems.   |
|  | 101007.3 | Able to distinguish between and provide examples of renewable and nonrenewable resources & analyze personal consumption of resources.  |
|  | 101007.4 | Able to Identify key threats to biodiversity and develop appropriate policy options for conserving biodiversity in different settings.   |
| <b>107008</b><br><b>Engineering Mathematics-II</b> | 107008.1 | Able to know the effective mathematical tools for solutions of first order differential equations that model physical processes such as Newton's law of cooling, electrical circuit, rectilinear motion, mass spring systems, heat transfer etc. |
|  | 107008.2 | Able to solve the advanced integration techniques such as Reduction formulae, Beta functions, Gamma functions, Differentiation under integral sign and Error functions needed in evaluating multiple integrals and their applications.           |
|  | 107008.3 | Able to trace the curve for a given equation and measure arc length of various curves.   |
|  | 107008.4 | Able to understand the concepts of solid geometry using equations of sphere, cone and cylinder.  |
|  | 107008.5 | Able to know the evaluation of multiple integrals and its application to find area bounded by curves, volume bounded by surfaces, Centre of gravity and Moment of inertia  |
| <b>107009</b><br><b>Engineering Chemistry</b>      | 107009.1 | Able to apply the different methodologies for analysis of water and techniques involved in softening of water as commodity.  |
|  | 107009.2 | Able to select appropriate electro-technique and method of material analysis.  |
|  | 107009.3 | Able to demonstrate the knowledge of advanced engineering materials for various engineering applications.  |
|  | 107009.4 | Able to analyze fuel and suggest use of alternative fuels.   |
|  | 107009.5 | Able to Identify chemical compounds based on their structure.  |
|  | 107009.6 | Able to explain causes of corrosion and methods for minimizing corrosion.  |

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| <b>104010<br/>Basic Electronics<br/>Engineering</b> | 104010.1 | Able to explain the working of P-N junction diode and its circuits.  |
|   | 104010.2 | Able to identify types of diodes and plot their characteristics and also can compare BJT with MOSFET.  |
|   | 104010.3 | Able to build and test analog circuits using OPAMP and digital circuits using universal/basic gates and flip flops.  |
|   | 104010.4 | Able to use different electronics measuring instruments to measure various electrical parameters.  |
|   | 104010.5 | Able to select sensors for specific applications.  |
|   | 104010.6 | Able to describe basic principles of communication systems.  |
| <b>101011<br/>Engineering<br/>Mechanics</b>         | 101011.1 | Able to determine resultant of various force systems.  |
|   | 101011.2 | Able to determine centroid, moment of inertia and solve problems related to friction.  |
|   | 101011.3 | Able to determine reactions of beams, calculate forces in cables using principles of equilibrium.  |
|   | 101011.4 | Able to solve trusses, frames for finding member forces and apply principles of equilibrium to forces in space.  |
|   | 101011.5 | Able to calculate position, velocity and acceleration of particle using principles of kinematics.  |
|   | 101011.6 | Able to calculate position, velocity and acceleration of particle using principles of kinetics and Work, Power, Energy.  |
| <b>102012<br/>Engineering<br/>Graphics</b>          | 102012.1 | Able to draw the fundamental engineering objects using basic rules and able to construct the simple geometries.  |
|   | 102012.2 | Able to construct the various engineering curves using the drawing instruments.  |
|   | 102012.3 | Able to 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. |
|   | 102012.4 | Able to Apply the visualization skill to draw a simple isometric projection from given orthographic views precisely using drawing equipment                          |
|   | 102012.5 | Able to draw the development of lateral surfaces for cut section of geometrical solids.  |
|   | 102012.6 | Able to draw fully-dimensioned 2D, 3D drawings using computer aided drafting tools.  |

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| <b>110013</b><br><br><b>Project Based Learning</b> | 110013.1 | Project based learning will increase their capacity and learning through shared cognition.   |
|  | 110013.2 | Able to draw on lessons from several disciplines and apply them in practical way.  |
|  | 110013.3 | Able to 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.                                      |
| <b>101014</b><br><br><b>Audit Course 2</b>         | 101014.1 | Able to understand environmental pollution and the science behind those problems and potential solutions.  |
|  | 101014.2 | Able to have knowledge of various acts and laws and will be able to identify the industries that are violating these rules.  |
|  | 101014.3 | Able to assess the impact of ever increasing human population on the biosphere: social, economic issues and role of humans in conservation of natural resources.   |
|  | 101014.4 | Able to learn skills required to research and analyze environmental issues scientifically and learn how to use those skills in applied situations such as careers that may involve environmental problems and/or issues. |