

Yeshwantrao Chavan College of Engineering

Course Outcomes of all Courses of First Year

| Course Code and Course Outcome | Statement of Course Outcome | Programme Outcome |
|--------------------------------|---|-------------------|
| | Students will be able to | |
| GE-2101-CO-1 | Apply the knowledge of differentiation to develop the Mathematical equations and compute geometrical measures | PO-1,PO-2 |
| GE-2101-CO-2 | Determine the expansion and derivatives of functions of Multiple variables and use it to find extreme values of functions. | PO-1,PO-2 |
| GE-2101-CO-3 | Evaluate the integrals of single, multiple variables and use it to measure the dimensions of various geometrical figures. | PO-1,PO-2 |
| GE-2101-CO-4 | Discuss Calculus of Scalar and vector point function and use appropriate theorems to evaluate integrals of functions of single, multiple variables. | PO-1,PO-2 |

Course Name: Engineering Mathematics-I (Course Code: GE2101)

Course Name: Engineering Mathematics-II (Course Code: GE2102)

| Course Code and Course Outcome | Statement of Course Outcome | Programme Outcome |
|--------------------------------|---|-------------------|
| | Students will be able to | |
| GE-2102 CO-1 | Use appropriate Methods to solve first order and higher order differential equations and apply it to find solutions of engineering problems | PO-1,PO-2 |
| GE-2102 CO-2 | Analyse the functions of complex numbers and variables, prove Mathematical equations and evaluate the complex integrals | PO-1,PO-2 |

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|-----------------|--|----------------|
| GE-2102 CO-3 | Use Matrix method to solve linear equations, evaluate eigen values - eigen vectors and its applications. | PO-1,PO-2 |
| GE-2102 CO-4 | Measure the statistical parameters and derive the equations of best fit curves | PO-1,PO-2,PO-3 |

Course Name: Communication Skill (Course Code: GE2107)

| Course Code and Course Outcome | Statement of Course Outcome | Programme Outcome |
|---------------------------------------|---|--------------------------|
| | Students will be able to | |
| GE-2107 CO-1 | Explain the basics of communication process as well as identify the barriers in communication. | PO-10 |
| GE-2107 CO-2 | Classify and describe the different Speech Sounds of English Language. | PO-10 |
| GE-2107 CO-3 | Apply different strategies and techniques of presentations, interviews and group communication. | PO-10 |
| GE-2107 CO-4 | Prepare and draft reports, memos and emails with appropriate content and context. | PO-9, PO-10 |

Course Name: Social Science (Course Code: GE2108)

| Course Code and Course Outcome | Statement of Course Outcome | Programme Outcome |
|---------------------------------------|--|--------------------------|
| | Students will be able to | |
| GE-2108 CO-1 | Explain the basic concepts of Social Sciences. | PO-6,PO-12 |
| GE-2108 CO-2 | Describe the development of various Civilizations and their Culture. | PO-6 |

| | | |
|-----------------|---|-------------|
| GE-2108 CO-3 | Analyse the Impact of Industrialization on society and discuss the Fundamental Concepts of Society. | PO-6 |
| GE-2108 CO-4 | Explain Industrial Organization and Management. | PO-6, PO-11 |

**Course Name: Engineering Physics (Course Code: GE2105)
Engineering Physics Lab (Course Code: GE2106)**

| Course Code and Course Outcome | Statement of Course Outcome | Programme Outcome |
|--------------------------------|--|-------------------|
| | Students will be able to | |
| GE-2105 & GE-2106 CO1 | Examine the intensity variation of light due to interference, diffraction and its applications. | PO-1, PO-2 |
| GE-2105 CO2 | Explain fundamentals of quantum mechanics and its application to problems dealing with quantum particle. | PO-1, PO-2 |
| GE-2105 & GE-2106 CO3 | Develop ability to classify and analyze the characteristics of semiconductor materials in terms of crystal structures, charge carriers and energy bands for device applications. | PO-1, PO-2 |
| GE-2105 & GE-2106 CO4 | Analyze the motion of charged particle in electric and magnetic fields and its applications to electron optic devices. | PO-1, PO-2 |
| GE-2105 & GE-2106 CO5 | Illustrate working principle of lasers, ultrasonic waves and its properties for useful applications in the field of industry. | PO-1, PO-2 |

Course Name: Engineering Physics Lab (Course Code: GE2106)
List of Experiments Available

| S.No. | Name of Experiment | CO-PO |
|--------------|---|-----------------|
| 1 | To study variation of Hall voltage with current and magnetic field; and to determine Hall coefficient, concentration and polarity of charge carriers. | CO3 PO1, PO2 |
| 2 | To measure the amplitude and frequency of sinusoidal voltage obtained from the secondary of a step down transformer using CRO. | CO4 PO1, PO2 |
| 3 | To study the static characteristics of semiconductor diode; (Germanium and Silicon diode) in forward and reverse bias mode | CO3 PO1, PO2 |
| 4 | To determine the forbidden energy gap of a semiconductor by studying the temperature variation of its receptivity using four probe method. | CO3 PO1, PO2 |
| 5 | To measure the phase shift introduced by a phase shift network using dual beam CRO. | CO4 PO1,PO2 |
| 6 | Determination of the velocity of ultrasonic waves in a non-electrolytic liquid by ultrasonic interferometer. | CO5 PO1,PO2 |
| 7 | To determine the radius of curvature of Plano-convex lens by using Newton's Rings apparatus. | CO1 PO1,PO2 |
| 8 | To determine the thickness of thin paper using Air Wedge arrangement. | CO1 PO1,PO2 |
| 9 | To determine the wavelength of sodium light using Plane Transmission Grating. | CO1 PO1,PO2 |

Course Name: Engineering Chemistry (Course Code: GE-2103)

Engineering Chemistry Lab (Course Code: GE-2104)

| Course Code and Course Outcome | Statement of Course Outcome | Programme Outcome |
|---------------------------------------|--|--------------------------|
| | Students will be able to | |
| GE-2103 & GE-2104 CO-1 | Assess qualitative and quantitative aspects of water as a conventional material for industrial and domestic applications. | PO-1,PO-2,PO-4 PO-7 |
| GE-2103 & GE-2104 CO-2 | Apply the knowledge of basic electrochemistry to understand battery technology, corrosion process and preventive techniques. | PO-1 |
| GE-2103 & GE-2104 CO-3 | Know the basics and assess analytical aspects of industrial materials like fuels and lubricants for efficient utilization. | PO-1,PO-2,PO-4 PO-7 |
| GE-2103 & GE-2104 CO-4 | Recognise the significance of cement and advanced engineering materials in technological applications | PO-1, PO-7 |
| GE-2103 & GE-2104 CO-5 | Analyze and generate analytical and instrumental techniques | PO-1,PO-2,PO-4 PO-7 |

Engineering Chemistry Lab(Course Code: GE-2104)
List of Experiments

| S.No. | Name of Experiment | CO-PO |
|-------|--|-----------------------------|
| 1. | Estimation of hardness | CO-1, CO-5,PO1, PO2 PO4,PO7 |
| 2. | Estimation of alkalinity | CO-1 CO-5,PO1, PO2 PO4,PO7 |
| 3. | Estimation of copper | CO-5,PO1 PO2, PO4,PO7 |
| 4. | Estimation of iron | CO-5,PO1,PO2, PO4,PO7 |
| 5. | Determination of viscosity | CO-3, PO1 PO2 ,PO4,PO7 |
| 6. | Analysis of coal | CO-3, PO1, PO2 ,PO4,PO7 |
| 7. | Determination of Flash point by Pensky- Marten's apparatus | CO-3, PO1, PO2 ,PO4,PO7 |
| 8. | Determination of ion exchange capacity of resin | CO-1, PO1, PO2, PO4,PO7 |
| 9. | Determination of pH | CO-1,PO1, PO2, PO4,PO7 |
| 10. | Preparation of urea formaldehyde resin | CO-5,PO1 , PO2, PO4,PO7 |
| 11. | Workshop on analytical techniques | CO-1 PO1 ., PO2, PO4.PO7 |
| 12. | Mini project | CO-4, PO1 PO7 |
| 13. | Initial and final setting time of cement | CO-5, PO1 PO2 PO4, PO7 |

**Course Name: Engineering Mechanics (Course Code: CV-2101) &
Engineering Mechanics LAB (Course Code: CV-2102)**

| Course Code and Course Outcome | Statement of Course Outcome | Programme Outcome |
|---------------------------------------|--|-------------------|
| | Students will be able to | |
| CV-2101 CO-1 | Describe the fundamental concepts of statics and dynamics. | PO1, PO-2, PO-11 |
| CV-2101 CO-2 | Apply the basic concepts of applied mechanics for solution of problems on planar force system. | PO1, PO-2, PO-11 |
| CV-2101 CO-3 | Determine the properties of surface like centroid, moment of inertia, etc. for planar surfaces and mass moment of inertia for rigid body | PO1, PO-2, PO-11 |
| CV-2101 CO-4 | Analyze pin jointed truss frame structure and beam structure analytically and graphically. | PO1, PO-2, PO-11 |
| CV-2101 CO-5 | Evaluate the dynamic variables of kinetics of particles and simple lifting machine | PO1, PO-2, PO-11 |

Name of Course: Engineering Mechanics Lab. (CV 2102)**List of Experiments**

| S.No. | Name of Experiment | CO-PO |
|--------------|--|--------------------------|
| 1 | To determine support reactions of a Simply Supported Beam experimentally and analytically. | CO1 PO1,PO2,PO11 |
| 2 | To determine the forces in the members of a Jib Crane Apparatus experimentally and graphically. | CO1, PO1,PO2, |
| 3 | To determine the coefficient of friction between two surfaces of different material on Plane Friction Apparatus. | CO1, CO-2 PO1,PO2, |
| 4 | To determine the coefficient of friction of Coil Friction Apparatus | CO1, PO1,PO2 |
| 5 | To determine the mass moment of inertia of a fly wheel using Fly Wheel Apparatus | CO1,CO-3 PO1,PO2 |
| 6 | To determine efficiency and law of machine of Differential Axle & Wheel machine. | CO1,CO-5 PO1,PO2 |
| 7 | To determine efficiency and Law of machine of Single Purchase Crab machine. | CO1,CO-5 PO1,PO2 |
| 8 | To determine efficiency and Law of machine of Double Purchase Crab machine. | CO1,CO-5 PO1,PO2 |
| 9 | To find support reactions of a simply supported beam using graphical method and hand calculation. | CO1 PO1,PO2,PO11 |
| 10 | To find the forces in the member of truss using graphical method and hand calculation | CO1,CO-4 PO1,PO2,PO11 |

Course Name: Basic Electronics (Course Code: EE 2101)

| Course Code and Course Outcome | Statement of Course Outcome | Programme Outcome |
|--------------------------------|--|-------------------|
| | The students will be able to: | |
| EE 2101 CO-1 | Characterize Number systems, semiconductors, diodes, transistors and operational amplifiers. | PO-1, PO2, PO-3 |
| EE 2101 CO-2 | Design simple analog circuits | PO-1, PO2, PO-3 |
| EE 2101 CO-3 | Design simple combinational and sequential logic circuits | PO-1, PO2, PO-3 |
| EE 2101 CO-4 | Identify functions of digital multimeter, Bridges and transducers in the measurement of physical variables | PO-1, PO2, |

Course Name: Introduction to Computer Programming (Course Code: IT2101), Introduction to Computer Programming Lab (Course Code: IT2102)

| Course Code and Course Outcome | Statement of Course outcomes | Programme Outcome |
|--------------------------------|---|-------------------|
| | Students are able to | |
| IT2101 CO1 | Know about computer system, basics of algorithm & flowchart, and demonstrate straight line program using basic 'C' programming language constructs. | PO-1 |
| IT2101 CO2 | Implement basic Linux commands and simple programs using different constructs in C. | PO-1 |
| IT2101 CO3 | Design & Develop programs using different loop control structures, user defined functions, and Pointers. | PO-1, PO-2 |
| IT2101 CO4 | Analyze and apply concepts of different dimensional Arrays as a data structure & development of programs using the same. | PO-2, PO-3 |

| | | |
|---------------|---|----------------|
| IT2101 CO5 | Design and develop programs using basics of Strings, Structures, union and Files in 'C' language. | PO-1 PO-2,PO-3 |
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Course Name: Electrical Engineering (Theory) & Lab (Course Code: EL 2101& EL 2102)

| Course Outcomes | Statement of Course Outcome | Programme Outcome |
|--|---|--------------------------|
| | Students are able to | |
| EL 2101& EL-2102 CO-1 | Reproduce fundamentals of dc circuits, single phase, and three phase ac circuits. | PO-1 |
| EL 2101& EL-2102 CO-2 | Analyse dc circuits, single phase and three phase ac circuits for basic electrical quantities such as current, voltage, power etc. | PO-1, PO-2 |
| EL 2101& EL-2102 EL 2101& EL-2102 CO-3 | Explain construction, working, testing, and applications of various electrical machines. | PO-3 |
| EL 2101& EL-2102 CO-4 | Analyse performance of various electrical machines. | PO-1, PO-2 |
| EL 2101& EL-2102 CO-5 | Perform laboratory experiments and demonstrate competency in collecting, interpreting, analysing data, communicate and present effectively through laboratory journals. | PO-1, PO-2, PO-9, PO-10 |

Course Name: Engineering Graphics (Course Code: ME2101) & Engineering Graphics LAB (Course Code: ME 2102)

| Course Code and Course Outcome | Statement of Course Outcome | Programme Outcome |
|---------------------------------------|------------------------------------|--------------------------|
| | Students will be able to | |

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| ME2101 CO1 | Transform orthographic projections into isometric projections and vice versa. | PO-1, PO-2 |
| ME2101 CO2 | Evaluate Projections of various One Dimensional, Two dimensional, Three dimensional objects. | PO-1, PO-2 |
| ME2101 CO3 | Built the development of lateral surfaces of various solids and their cut section. | PO-1, PO-2 |
| ME2101 CO4 | Predict the intersections and intersections of various solid objects. | PO-1, PO-2 |
| ME2101 CO5 | Justify the use of software tools used for Two dimensional drawings. | PO-1, PO-2 |

Course Name: Engineering Graphics Lab. (Course Code: ME 2102)

List of Experiments Available

| S.No. | Name of Experiment | CO-PO |
|--------------|--|--------------------|
| 1 | Introduction of AutoCAD Basic Commands | CO5 PO1,PO2 |
| 2 | Orthographic Projection | CO1,CO5 PO1,PO2 |
| 3 | Isometric Projection | CO1,CO5 PO1,PO2 |
| 4 | Projection of Straight Line | CO2,CO5 PO1,PO2 |
| 5 | Projection of Planar Surface | CO2,CO5 PO1,PO2 |

| | | |
|----|---|--------------------|
| 6 | Projection of Solid | CO2,CO5 PO1,PO2 |
| 7 | Section and Development of Solid | CO3,CO5 PO1,PO2 |
| 8 | Intersection of Surfaces | CO4,CO5 PO1,PO2 |
| 9 | Drawing Sheet 1: Convention for various lines, Dimensioning and Orthographic Projection | CO1,CO2 PO1,PO2 |
| 10 | Drawing Sheet 2: Projection of line, planar surface or solid. (Any one) | CO2 PO1,PO2 |

Course Name: Workshop Practice (Course Code: ME 2103)

| Course Code and Course Outcome | Statement of Course Outcome | Programme Outcome |
|--------------------------------|--|-------------------|
| | Students will be able to | |
| ME 2103 CO1 | Discuss about various manufacturing process like smithy, carpentry, Assembling, welding etc. and different machines. | PO-6, PO-9, PO-12 |
| ME 2103 CO2 | Operate the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc. | PO-6, PO-9, PO-12 |
| ME 2103 CO3 | Distinguish different measuring devices according to the work. | PO-6, PO-9, PO-12 |
| ME 2103 CO4 | Develop various shapes through different manufacturing methods | PO-6, PO-9, PO-12 |

Course Name: Workshop Practice (Course Code: ME 2103)-List of Experiments

| S.NO | Name of Experiments-WS | CO-PO |
|-------------|---|-------------------------|
| 1 | Study of Tools and Operations of different Welding techniques | CO-1- PO6 , PO9 PO12 |
| 2 | Study of Tools and Operations of Arc Welding | CO-1- PO6 , PO9 PO12 |
| 3 | Details of Arc Welding Operations | CO-1- PO6 , PO9 PO12 |
| 4 | Details of Gas Welding Tools | CO-1- PO6 , PO9 PO12 |
| 5 | Details of Gas Welding Operations | CO-1- PO6 , PO9 PO12 |
| 6 | Types of joints | CO-1- PO6 , PO9 PO12 |
| 7 | Study of Use and handling of common hand tools | CO-1- PO6 , PO9 PO12 |