



< Mechanical Engineering Department >  
K.K. Wagh Institute of Engineering Education and Research  
Hirabai Haridas Vidyanaigari, Amrut Dham, Panchavati, Nashik-422003

**Course Outcomes:**

**FY 2023 Pattern**

**Subject1: 2300101A: Linear Algebra**

	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Interpret the concepts of Jacobians, rank, quadratic form, canonical form, transformations, Eigen values, Eigen vectors and probability.	2-Understanding
<b>CO2</b>	Solve problems on linear algebra, partial derivatives and probability.	3- Apply
<b>CO3</b>	Apply concepts of linear algebra, differential calculus and probability to engineering problems.	3- Apply
<b>CO4</b>	Use computational tools for solving mathematical problems.	3- Apply
<b>CO5</b>	Analyze the nature of quadratic forms, extreme values of the function, error and approximations.	4 -Analyze

**Subject2: 2300102A: Differential Calculus**

	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Explain types of differential equations, finite differences and multiple integrals.	2- Understanding
<b>CO2</b>	Solve problems on differential equations and multiple integrals.	3- Apply
<b>CO3</b>	Apply concept of numerical methods, differential and multivariate calculus to engineering problems.	3- Apply
<b>CO4</b>	Use computational tools for solving mathematical problems.	3- Apply
<b>CO5</b>	Analyze the solution of differential equations, numerical differentiation & integration and multiple integrals.	4- Analyze

**Subject3: 2300103A: Applied Physics**

	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Describe basics of electromagnetics, advanced materials, wave optics, wave mechanics and environmental energy	1-Knowledge
<b>CO2</b>	Classify advanced materials, refracting crystals and solar cell	2-Understand
<b>CO3</b>	Explain properties of superconductors, nano-materials and matter waves	2-Understand
<b>CO4</b>	Calculate characteristics of electromagnetic circuits and optical devices, conductivity, efficiency of solar and wind power unit.	3-Apply
<b>CO5</b>	Use concepts of electromagnetic effect, semiconductors, wave optics and wave equations in real life problems	3-Apply

**Subject4: 2300103B: Applied Physics**

	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Describe basics of mechanics, advanced materials, wave optics and environmental energy	1-Knowledge
<b>CO2</b>	Classify motions in kinematics, advanced materials, refracting crystals and solar cell	2-Understand
<b>CO3</b>	Explain properties of superconductors and nano-materials	2-Understand



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CO4	Calculate parameters in kinematics, conductivity, efficiency of solar and wind power unit	3-Apply
CO5	Use knowledge of Laws of kinematics, semiconductors and wave optics in real life problems	3-Apply

**Subject5: 2300104A: Applied Chemistry**

	Course Outcomes	Bloom's Level
CO1	Describe different techniques used for chemical entities present in fluids, fuel, polymer, alloys.	1-Knowledge
CO2	Select appropriate technology involved in determination of purity and properties of material.	2- Understand
CO3	Illustrate causes and preventive measures of ill effect of hard water and corrosion	3-Apply
CO4	Analyse the fluids, fuels and selection of appropriate purification methods.	3-Apply
CO5	Compare composition of fuels, purity of water and mitigation for corrosion control	4-Analyze

**Subject6: 2300105A: Fundamentals of Electrical Engineering**

	Course Outcomes	Bloom's Level
CO1	Define terminologies and laws related to AC-DC circuits, machines and batteries.	1-Remember
CO2	Demonstrate the need for safety precautions and procedures, components and instruments in the laboratory.	2-Understand
CO3	Elaborate construction, working and performance characteristics of electrical machines and protective devices.	2-Understand
CO4	Solve problems on AC-DC circuits, work, power and energy using relevant laws and theorems.	3-Apply
CO5	Select appropriate machines, protective devices for a given applications.	3-Apply
CO6	Calculate and analyze transformer efficiency, regulation and LT, HT electricity bill.	4-Analyze

**Subject7: 2300106A: Basic Electrical Engineering**

	Course Outcomes	Bloom's Level
CO1	Define terminologies and laws related to AC-DC circuits, machines and batteries and solve numerical	1-Remember
CO2	Demonstrate the need for safety precautions and procedures, components and instruments in the laboratory.	2-Understand
CO3	Elaborate construction, working and performance characteristics of electrical machines and protective devices.	2-Understand
CO4	Select appropriate machines, protective devices for a given applications.	3-Apply
CO5	Calculate and analyze transformer efficiency, regulation and LT, HT electricity bill.	4-Analyze



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**Subject8: 2300107A: Fundamentals of Electronics Engineering**

	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Describe the working of semiconductor diodes, transistors and OpAmp.	2- Understand
<b>CO2</b>	Explain the basics of number systems, logic gates, Boolean algebra, electronic communication system, AM, FM, cellular concepts and GSM system.	2- Understand
<b>CO3</b>	Apply the knowledge of semiconductor diodes, transistors and OpAmp in realization of basic analog circuits.	3-Apply
<b>CO4</b>	Apply the knowledge of number systems, logic gates and Boolean algebra in realization of basic digital circuits.	3-Apply
<b>CO5</b>	Analyze the basic analog and digital application circuits.	4-Analyze

**Subject9: 2300108A: Programming in C**

	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Illustrate algorithm, flowchart for a given problem	2- Understand
<b>CO2</b>	Apply fundamentals of 'C' programming to solve a given problem	3-Apply
<b>CO3</b>	Build a solution for a given problem using conditional and iterative algorithmic constructs	3-Apply
<b>CO4</b>	Use arrays and functions in developing programs	3-Apply
<b>CO5</b>	Develop program using structure	3-Apply

**Subject10: 2300109A: Programming in C++**

	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Illustrate Object Oriented Programming concepts to solve various computing problems using C++	2-Understand
<b>CO2</b>	Apply the concept of Inheritance for reusability of a class	3-Apply
<b>CO3</b>	Apply Polymorphism to build a solution	3-Apply
<b>CO4</b>	Use template and exception handling in a given problem	3-Apply
<b>CO5</b>	Use files for developing a program	3-Apply

**Subject11: 2300110A: Engineering Drawing**

<b>COs</b>	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Explain the need of engineering drawing and its standards.	2-Understand
<b>CO2</b>	Interpret engineering drawing by visualization.	2-Understand
<b>CO3</b>	Draw projections of 2D and 3D objects.	3-Apply
<b>CO4</b>	Apply manual and computerized graphical tools to solve practical problems.	3-Apply



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**Subject12: 2300111A: Workshop Practice**

	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Select appropriate machine and cutting tools for a given application	1- Remember
<b>CO2</b>	Describe the process and programming methods for CNC machines and 3D printing	2-Understand
<b>CO3</b>	Apply the basic knowledge of Shop Floor Safety, Machine tools and Manufacturing processes.	3-Apply
<b>CO4</b>	Fabricate the simple mechanical parts	3-Apply

**Subject13: 2300112A: Communication Skills**

	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Develop effective communication skills including Listening, Reading, Writing and Speaking	<b>3-Apply</b>
<b>CO2</b>	Practice professional etiquette and present oneself confidently.	<b>3-Apply</b>
<b>CO3</b>	Function effectively in heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.	<b>3-Apply</b>
<b>CO4</b>	Evaluate oneself by performing SWOC Analysis to introspect about individual's goals and aspirations.	<b>4-Evaluate</b>
<b>CO5</b>	Constructively participate in group discussion, meetings and prepare and deliver Presentations.	<b>4-Evaluate</b>

**Subject14: 2300113A: Engineering Mechanics**

	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Select appropriate method to solve problems on rigid bodies.	1 - Remember
<b>CO2</b>	Extend the concepts of engineering mathematics and trigonometry for analyzing structures.	2 - Understanding
<b>CO3</b>	Construct the free body diagram and correlate active and reactive forces.	3 - Applying
<b>CO4</b>	Determine centroid and moment of inertia of plane lamina.	3 - Applying
<b>CO5</b>	Apply the concept of work, power, energy and impulse-momentum to solve engineering problems.	3 - Applying

**Subject15: 2300114A: Fundamentals of Mechanical Engineering**

	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Explain the basic concepts of IC engine, thermodynamics and smart manufacturing.	2- Understand
<b>CO2</b>	Identify various components of electric and hybrid vehicles.	2- Understand
<b>CO3</b>	Apply the knowledge of laws of thermodynamics and heat transfer to heat engine, heat pump and refrigerator.	3- Apply
<b>CO4</b>	Calculate material parameters for a given application	3- Apply
<b>CO5</b>	Select a suitable power transmission element for a required application.	3- Apply



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**Subject 16: 2300115B: Engineering Explorations**

	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Apply principles from several disciplines.	<b>3-Apply</b>
<b>CO2</b>	Demonstrate long-term retention of knowledge and skills acquired.	<b>3-Apply</b>
<b>CO3</b>	Function effectively as a team to accomplish a desired goal.	<b>3-Apply</b>
<b>CO4</b>	Explore an Engineering Product and prepare its Mind map	<b>4-Analysis</b>
<b>CO5</b>	Enhance their learning ability to solve practical problems.	<b>5-Synthesis</b>