



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Diploma in Mechanical Engineering

SEMESTER I

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
DTMA101N		APPLIED MATHEMATICS-I	60	20	20	0	0	3	0	0	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;

* **Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs):

To introduce the students with the fundamentals of the Engineering Mathematics.

Course Outcomes (COs):

After the successful completion of this course students will be able to

1. Apply the techniques of algebra.
2. Understand the quadratic equations.
3. know the fundamental concepts of Binomial theorem.
4. Study the trigonometric properties used in the engineering.

Syllabus

Unit - I

Algebra: Logarithm, Definition of natural and common Logarithm; Laws of Logarithm; Simple Problems based on laws of logarithm.

Unit - II

Complex Numbers: Definition of Complex numbers, Cartesian and polar. Exponential forms of complex numbers; Modulus, amplitude & conjugate of a complex number; Algebra of Complex numbers (Equality, Addition, Subtraction, Multiplication);

Unit - III

Cube root of unity & Quadratic Equations: Cube root of unity and properties of cube root of unity. Definition of Quadratic Equations, Analyzing the nature of roots using discriminant, Relation between roots & coefficients, simple problems.

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DTMA101N		APPLIED MATHEMATICS-I	60	20	20	0	0	3	0	0	3

Unit – IV

Binomial Theorem: Definition of factorial notation, definition of permutation and combination with formula, Binomial theorem for positive index (statement only), General term and middle term. Binomial theorem for negative index (statement only).

Unit – V

Trigonometry: Relation between degree and radian, trigonometric ratios, sign of trigonometric ratios or function, simple problems based on trigonometric functions.

Reference Books:

1. B.K. Paul, *Diploma Engineering Mathematics (Vol-1)*, U.N. Dhār & Sons
2. G.P. Samanta, *a Text Book of Diploma Engineering Mathematics, Volume-1*, Learning Press.
3. Dr. S. Bose & S. Saha, *A Complete Text Book of Mathematics*, Lakshmi Prakasan
4. H.S. Hall & S.R. Knight, *Higher Algebra* Book Palace, New Delhi
5. S.L. Loney, *Trigonometry* S. Chand & Co.
6. H.K. Dass *Engineering Mathematics* S. Chand & Co.
7. B.K. Pal, K. Das, *Engineering Mathematics, Volume-1*, U.N. Dhar & Sons
8. B.C. Das & B.N. Mukherjee, *Differential Calculus* U.N. Dhar & Sons

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Physics Syllabus for Diploma Program

Effective From Session 2025-26

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	TA	END SEM	TA				
DTPH101	DC	Applied Physics	60	20	20	30	20	3	0	2	04

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
Q/A – Quiz/Assignment/Attendance, MST- Mid Sem Test.

Course Objectives: -

Objectives:–

Students should be able to

1. Understand different systems of units and convert units from one system to another as well as estimate and minimize the errors in measurements.
2. Understand and apply the concepts of Elasticity, Fluid mechanics and Surface Tension.
3. Understand and apply the concepts of Reflection, Refraction, Interference, Diffraction and Polarization of light
4. Understand and apply the basic concepts of Electricity and Magnetism
5. Understand the properties of laser to apply them for various engineering applications including optical fiber communication.
6. Visualize and realize the concepts of Physics studied in theory and apply them in simple experiments.

Course Outcomes: -

Students will be able to

1. Differentiate various systems of units and convert units from one system to another as well as estimate and minimize the errors in measurements.
2. Understand the concepts of Elasticity, Fluid mechanics and Surface Tension and apply them for simple applications.
3. Understand the concepts of the concepts of Reflection, Refraction, Interference, Diffraction and Polarization of light and to apply them for simple applications.
4. Understand the concepts of Electricity and Magnetism and apply them for simple applications.
5. Understand the properties of laser and apply them for various engineering applications including optical fiber communication.
6. Visualize and realize the concepts of Physics studied in theory and apply them in simple experiments.

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Syllabus

UNIT I: Units and Measurements

Requirements of standard units, various unit systems (CGS, FPS, MKS, SI), conversions, fundamental and derived physical quantities and their units and dimensions. Errors in measurement, significant figures and precision, Accuracy and precision of instruments.

UNIT II: Properties of matter

Elasticity: Deformation, Restoring force, Stress, Strain relationship, Hooke's law, Young's modulus, bulk, modulus, shear modulus of rigidity (qualitative idea only), Poisson's ratio.

Fluid Mechanics: Newton's law of viscosity, coefficient of viscosity, streamline and turbulent flow, factors affecting viscosity. Cohesive and adhesive forces, surface tension, factors affecting surface tension.

Unit: III Optics

Wave Theory of Light: Huygen's theory, wavefronts, laws of reflection and refraction, total internal reflection, dispersion.

Interference and Diffraction: Principle of superposition, constructive and destructive interference, Introduction to diffraction, Fresnel and Fraunhofer diffraction.

Polarization: Polarized and unpolarized light, Plane of polarization, Plane of Vibration, Optic Axis Plane, circularly and elliptically Polarized light.

Unit: IV Electricity and Magnetism

Coulomb's Law, Electric Field, Intensity of Electric field and Electric Potential, Ohm's law, Resistivity, Conductivity, Series and Parallel combination of resistors. Magnetic field, Magnetic flux, Magnetic flux density. Concept electromagnetic Induction, Faraday's law, Lorentz Force, Oersted's experiment.

Unit: V Laser and Fibre Optics

Laser: Stimulated and Spontaneous Emission, Population Inversion, Pumping, Optical Resonator, Properties and Applications of Laser, Ruby Laser.

Optical fibre: Introduction to Optical fibre, Ray theory of propagation through optical fibre, Acceptance angle and cone, Types of Optical fibre, Numerical Aperture, applications of optical fibre.

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List of Laboratory experiments

1. Determination of Least count and zero error of Vernier caliper and observations with Spectrometer.
2. Determination of Least count and Zero error of Micrometer Screw Gauge.
3. Use of Micrometer Screw Gauge and observations with traveling microscope.
4. Determination of resistivity of a given wire.
5. Determination of volume of a given vessel by spherometer.
6. To find unknown resistance by PO Box.
7. To verify Hooke's law.
8. To verify Snell's law.
9. Determination of refractive index of material of glass slab.
10. To verify Ohm's law.

Textbook and Reference Books:

Learning Resources:-

Text Book: -

1. Engineering Physics by Gaur R. K. and Gupta S. L., Dhanpat Rai Publications, New Delhi, Eighth Edition 2010, Physics Textbook of 11th & 12th std. (NCERT)

References: -

1. Fundamentals of Physics Extended, By Halliday D., Resnik R. and Walker, Wiley, India, New Delhi, Eighth Edition, 2008.
2. Physics for scientists and Engineers by Serway R. A. and Jewett, Jr. J. W., Thomson Learning (Indian reprint), New Delhi, Sixth Edition, 2007.

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(w.e.f. A.Y. 2024)

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COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTEE101		Basic Electrical Engineering	60	20	20	30	20	2	0	2	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activities; P - Practical
 *Teacher Assessment

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;
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Course Educational Objectives (CEOs):

1. To impart the basic knowledge about the Electric and Magnetic circuits.
2. To explain the working principle, construction, applications of DC machines, AC machines.

Course Outcomes (COs):

After the successful completion of this course students will be able to

1. Understand and analyse basic circuit concepts.
2. Apply knowledge of mathematics to analyse and solve electrical circuit problems.
3. Understand the AC fundamentals.
4. Illustrate basic knowledge about the Electric and Magnetic circuits.
5. Distinguish the working Principles of various Electrical Machines.

Syllabus

UNIT I

Basic Terminology and their concepts: Current, EMF, resistance and resistivity, conductors & insulators, semiconductors. Electrical power, Electrical energy, and their units (SI). **8 Hrs.**

UNIT II

D.C. Circuits: Ohm's law, Resistance in series, parallel and series - parallel combinations, Kirchhoff's voltage law and Kirchhoff's current law. **8 Hrs.**

UNIT III

Electromagnetism: Concept of magnetic flux, flux density, magnetic field intensity, permeability and their units. Magnetic circuits, concept of reluctance and mmf. Analogy between electric and magnetic circuits. Lenz's Law, Fleming's left-hand rule & Fleming's right-hand rule. Self and mutual inductance. **9 Hrs.**

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UNIT IV

A.C Circuits:- Instantaneous value, maximum (peak) value, cycle, frequency, alternating current and voltage. Difference between AC and DC. Average and RMS value of alternating voltage and current. Concept of phase, phase difference, Apparent power, reactive power and active power, power factor. **9 Hrs.**

UNIT V

Basic Concepts of Electrical Machines: Introduction of Transformer, DC Machine, Induction motor and Synchronous machines. **9 Hrs.**

Textbooks:

1. Basic Electrical Engineering, V.N Mittle & Arvind Mittal, TMH, Second Edition.
2. Basic Electrical engineering, D.P Kothari & I.J Nagrath, TMH, Second Edition.

References:

1. B. L. Theraja, "Electrical Technology", Vol.1, S. Chand Publication, New Delhi
2. E. Hughes, 'Electrical and Electronics Technology', Pearson, 2010.
3. L. S. Bobrow, 'Fundamentals of Electrical Engineering', Oxford University Press.

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTEE101		Basic Electrical Engineering	60	20	20	30	20	2	0	2	3

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List of Experiments:

1. Verification of KCL and KVL for DC circuits.
2. Measurement of current, power and power factor of incandescent lamp, fluorescent lamp, and LED lamp.
3. Measurement of resistance and inductance of a choke coil using 3 voltmeter method.
4. Two way and three-way control of lamp and formation of truth table.
5. Measurement of earth resistance.
6. Study of effect of open and short circuit in simple circuits.
7. Demonstration of fuse and MCB separately by creating a fault.
8. Demonstration of cut-out sections of electrical machines (DC machines, Induction machines and synchronous machines).
9. Understanding AC and DC supply. Use of tester and test lamp to ascertain the healthy status of mains.

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Diploma in Mechanical Engineering
SEMESTER II (2025-2028)

COURSE CODE	CATEGO RY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTME101	BEC	ENGINEERING DRAWING	60	20	20	30	20	2	0	2	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

Students will be able to understand the fundamental principles of engineering drawing, including geometric constructions, projection techniques, and dimensioning standards, ensuring clarity and precision in technical communication.

Course Outcomes (COs):

After completion of this course the student are expected to be able to demonstrate following knowledge skills and attitudes.

1. Students will create accurate engineering drawings with title blocks, line types, and dimensioning methods.
2. Students will construct complex geometric shapes, including regular polygons and conic sections, using manual techniques.
3. Students will prepare orthographic and isometric projections, accurately translating 3D objects into 2D representations.
4. Students will effectively project points and lines in different quadrants, determining their true lengths and angles accurately.

Syllabus

Unit - I

Introduction: Introduction to Engineering Drawing and its importance, Types of Engineering Drawings, Drawing Instruments & Accessories, Drawing Sheet Sizes, Sheet Layout & Title Block, Types of lines and their applications, Conventional representation of Materials, Lettering, Dimensioning: Dimensioning terminology, Types, Methods & Rules for dimensioning.

Unit - II

Geometrical Construction: Divide a line and Circle, Angle bisect, Triangles, Construction of Regular Polygons.

Scales: Introduction, Scale Representation, Units of measurements, Representative Fraction, Construction of Plain Scale.

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COURSE CODE	CATEGO RY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTME101	BEC	ENGINEERING DRAWING	60	20	20	30	20	2	0	2	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Unit - III

Conic Section Curve: Application Conic Section Curves, Construction of Ellipse, Parabola, and Hyperbola. Tangent & Normal to Ellipse, Parabola, and Hyperbola.

Special Curve; Cycloid, Epicycloid, Hypocycloid and Involute Construction and applications.

Unit - IV

Orthographic Projections: Introduction, Multiview projection, Orthographic Projection terminology, First angle and third angle projection, Reference planes, Multi view drawings preparation.

Projection of Points & Lines: Introduction, Projection of points, projection of lines, Determination of true length & Inclination of line.

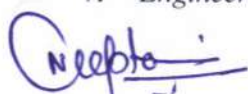
Unit – V

Isometric Projections: Principle of Isometric Projection, Construction of Isometric Scale, Isometric Projection & Isometric view, Dimensioning on Isometric Projection, four centre method to Draw Ellipse, Isometric Views of Right Solids, Non-Isometric Solids, Truncated Solids and Composite Solids.

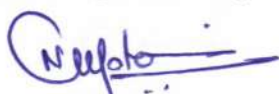
Introduction to Computer Aided Drafting: Introduction, CAD Application, CAD Software's and Hardware's. Introduction to AutoCAD; Drawing Space, Draw Commands, Modify Commands, Inquiry Commands, Dimension and Sheet Layout.

Text and Reference Books:

1. "Engineering Drawing" by Basant Agarwal & C.M. Agarwal, McGraw Hill Education, 2019.
2. "Engineering Drawing" by N.D. Bhatt, Charotar Publishing House, 2023 (Revised 54th Edition).
3. "Engineering Drawing" by P.S. Gill, S.K. Kataria & Sons, 2017.
4. "Engineering Graphics" by P.I. Varghese, McGraw Hill Education, 2020.
5. "Engineering Drawing and Graphics" by K. Venugopal, New Age International Publishers, 2020.
6. "Engineering Drawing - Hindi" by Yogendra Varshney, Deepak Prakashan.
7. "Engineering Drawing - Hindi" by P. N. Vijayavergiya, Deepak Prakashan.



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DTME101	BEC	ENGINEERING DRAWING	60	20	20	30	20	2	0	2	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

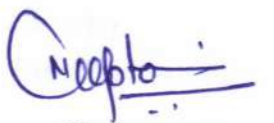
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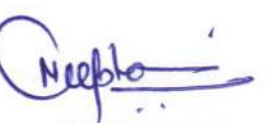
8. "Engineering Drawing - Hindi" by Prakash Asthana, Deepak Prakashan.

9. "Engineering Drawing - Hindi" by Aniket Modi, Deepak Prakashan.

List of Experiments

1. Prepare a title block and layout a drawing sheet according to standard sizes.
2. Practice drawing various types of lines (thick, thin, dashed, dotted) and understand their uses.
3. Perform dimensioning on simple geometrical shapes, demonstrating the correct terminology, methods, and rules.
4. Divide a line segment and a circle into specified parts using appropriate tools.
5. Construct regular polygons (triangles, squares, pentagons, etc.) using compass and straightedge.
6. Construct a plain scale with representative fractions, including measurements in different units.
7. Construct ellipses, parabolas, and hyperbolas using different methods and Draw tangents and normal.
8. Construct cycloids, epicycloids, hypocycloids, and involutes, demonstrating their applications in engineering.
9. Prepare orthographic projections of given 3D objects in first and third-angle projections.
10. Create multi-view drawings from given 3D sketches or objects.
11. Project points in different quadrants and determine true lengths and angles.
12. Practice the projection of lines at various angles and determine their true lengths and inclinations.
13. Draw isometric views of right solids and non-isometric solids from given orthographic views.
14. Create isometric views of truncated solids and composite solids.
15. Introduction of AutoCAD & Create basic drawings.


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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTME103	SEC	Workshop Practices	0	0	0	30	20	0	0	2	1

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Course Educational Objectives(CEOs):

The subject aims to provide the student with:

1. To become familiar with workshop technology, industrial safety protocols, and gain an understanding of material properties.
2. To gain practical knowledge and hands-on experience in carpentry, fitting, welding, and sheet metal work through various shop exercises.

Course Outcomes(COs):

Students will:

1. Students will understand the importance of workshops, the technology involved, and the necessary industrial safety measures and precautions.
2. Students will be able to effectively use carpentry tools and analyze different wood joints and their properties.
3. Students will be proficient in using fitting tools to create various shapes and designs.
4. Students will recognize and understand different welding techniques and their applications.
5. Students will be capable of designing various shapes using sheet metal and related tools.

Syllabus

UNIT I

8 Hrs.

Introduction to Workshop: Introduction, need of workshop and types of workshops, Industrial safety- Introduction, objective of industrial safety, causes of accidents, common sources of accidents, preventive measures, and common safety methods.

UNIT II

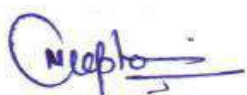
9 Hrs.

Carpentry Shop: Introduction, use of carpentry tools such as saws, chisels, and hammers, marking and measuring tools; cutting tools and striking tool types of wood, carpentry hardware, and basic carpentry operations like sawing and chiseling, types of timbers, defects in timbers, and common wood joints (cross-lap, corner-lap, dovetail and bridle joints).

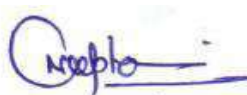
UNIT III

8 Hrs.

Fitting Shop: Introduction, different fitting tools, including work holding, marking, measuring, cutting, and finishing tools, preparation of simple jobs and joints, fitting operations such as filing and drilling, and emphasizing safety precautions in fitting tasks.



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SEMESTER I (2025-2028)

COURSE CODE	CAT-EGO-RY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTME103	SEC	Workshop Practices	0	0	0	30	20	0	0	2	1

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT IV

8 Hrs.

Welding Shop: Introduction, gas welding, arc welding, soldering, brazing, and gas cutting, welding tools and consumables, metal joining operations, and metal joints. safety precautions during metal joining and cutting operations.

UNIT V

9 Hrs.

Machine Shop: Introduction, types of machine tools (e.g., lathes, milling machines, drills, grinders), machine tool components and their functions, measuring tools such as calipers, micrometers, and height gauges

LIST OF EXPERIMENTS-

1. To study various industrial safety precautions & preventive measures.
2. To study the various timber properties, its defects and its prevention.
3. To make various joints (L-joint, T-joint, Cross joint, etc.) using carpentry tools.
4. To perform various fitting shop operations using fitting tools.
5. To study various welding methods and its safety precaution.
6. To make various welding joints (Butt joints, Lap, joints, corner joints, etc).
7. To study sheet metal properties and safety precautions.
8. To make various shapes using sheet metal tools and terminologies.

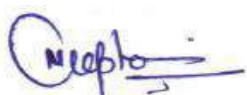
Text Books:

List of Textbooks-

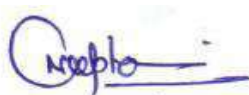
1. Manufacturing Technology by P. N. Rao
2. Workshop Technology by B.S. Raghuvanshi

List of Reference Books-

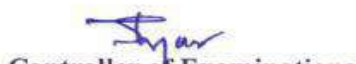
1. Production Technology by R.K. Jain
2. Principles of Manufacturing Material & Process - Campeau


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			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
DTME102	BEC	Basic Mechanical Engineering	60	20	20	30	20	2	0	2	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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Course Educational Objectives (CEOs):

To introduce the (A) main and sub domains of mechanical engineering (B) To introduce the space latest and future trends, jobs, and research opportunities in the field of mechanical engineering.

Course Outcomes (COs):

1. Students must be able to identify engineering trends and about mechanical engineering.
2. Students must be able to understand the basic concepts of thermodynamics, reciprocating machines, manufacturing process.
3. Students must be able to understand the basic concepts of measurements and how to apply in industry.

Syllabus

Unit-1

6 Hrs.

Overview of Engineering:

Introduction of engineering, classification of engineering disciplines, overview of mechanical engineering, domain and scope for mechanical engineers, jobs in engineering and future.

Unit-II

8 Hrs.

Thermodynamics:

Introduction and definition of thermodynamics, thermodynamics properties, laws of thermodynamics, classification and working of boilers, introduction of refrigeration, coefficient of performance.

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Unit-III

8 Hrs.

Reciprocating Machines:

Steam engine, Introduction of IC engine, terminology of IC engine, two and four stroke of petrol and diesel engine, applications of IC engines.

Unit-IV

8 Hrs.

Measurement:

Introduction of various measuring instruments and devices, force, torque, velocity, acceleration, temperature, pressure, vernier caliper, micrometer, dial gauges, slip gauges, sine bar and combination set.

UNIT-V

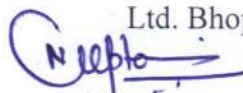
8 Hrs.

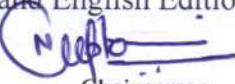
Manufacturing Process:

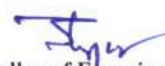
Introduction, definition and classification of basic manufacturing processes, properties of materials, introduction of casting, rolling, welding, soldering, extrusion.

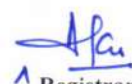
Text Books:

1. Gupta D K, Gupta B, & Baredar P (2020) A Textbook of Basic Mechanical Engineering, Dhanpat Rai & Co. (English Edition)
2. Rajpur R.K. (2022) A Textbook of Basic Mechanical Engineering, University Science Press (An imprint of Laxmi Publications Pvt. Ltd.) (English Edition)
3. Pandey S.S., Jain K.K. (2024), Basic Mechanical Engineering, Deepak Prakashan Pvt. Ltd. Bhopal (Hindi and English Edition)


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- Thakur R.K, (2024), Basic Mechanical Engineering, University Book House Pvt. Ltd. Jaipur (Hindi Edition)

Reference Books:

- Smith E.H. (1994) Mechanical Engineer's Reference Book. Society of Automotive Engineers, U.S.
- Kreith F & Goswami D (2004), The CRC Handbook of Mechanical Engineering, CRC Press.

List of Experiments

- To the study of two-stroke and four stroke diesel engines.
- To the study of two-stroke and four stroke petrol engines.
- To study the of Cochran boiler.
- To the study of Babcock and Wilcox boiler.
- To the study of Locomotive boiler.
- To the study of Lancashire boiler.
- To the study of mountings and accessories in boilers.
- To the study of measuring instruments.
- To conduct experiments on linear and angular measurements.

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