



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Program Name: Bachelor of Technology

SUBJECT CODE	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
		THEORY			PRACTICAL		Th	T	P	CREDITS
		END SEM	MST	Q/A	END SEM	Q/A				
BTMA201N	Mathematics II	60	20	20	-	-	3	1	-	4

Course Objective

To introduce the students to the fundamentals of integral calculus, differential equations, and numerical methods.

Course Outcomes

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

1. know the fundamental principles of integral calculus;
2. apply the techniques of integral calculus to the problems of rectification, volume and surface of revolution of curves;
3. construct and solve the differential equations of higher order;
4. use the concept of finite differences and interpolation in evaluation of value of functions.

Course Content:

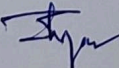
UNIT – I: Calculus of finite differences: Operators, forward difference operator, backward difference operator, E-operator, relation between them, difference of a polynomial, factorial polynomial, Inverse operator. forward difference table, Backward difference Table.

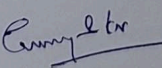
UNIT – II: Interpolation: Introduction to Interpolation; Interpolation with equally spaced interval, forward and backward interpolation formula, Interpolation with unequally spaced intervals, Newton divided difference interpolation, langrage's formula for interpolation and inverse interpolation.

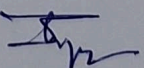
UNIT – III: Integral calculus: fundamental theorem of integral calculus, length of curves, volume, and surface area of revolution of curves.

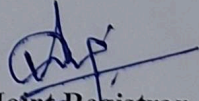
UNIT – IV: Evaluation of integrals using gamma function. Multiple integral: Double integral, area by double integral. Evaluation of triple integrals.

UNIT – V: Linear differential equations of n^{th} order: Linear differential equations of n^{th} order, method of variation of parameter and Cauchy's homogenous linear equations.


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		END SEM	MST	Q/A	END SEM	Q/A				
BTMA201N	Mathematics II	60	20	20	-	-	3	1	-	4

Texts:

- T. M. Apostol, Calculus, Volume I, 2nd Ed, Wiley, 1967.
- T. M. Apostol, Calculus, Volume II, 2nd Ed, Wiley, 1969.
- K. E. Atkinson, Numerical Analysis, John Wiley, Low Price Edition (2004).
- S. D. Conte and C. de Boor, Elementary Numerical Analysis - An Algorithmic Approach, McGraw-Hill, 2005.
- B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, Delhi
- Erwin Kreyszig, Advanced Engineering Mathematics, 10th Ed, John Wiley Publisher.

References:

- J. Stewart, Calculus: Early Transcendentals, 5th Ed, Thomas Learning (Brooks/ Cole), Indian Reprint, 2003.
- J. Stoer and R. Bulirsch, Introduction to Numerical Analysis, 2nd Edition, Texts in Applied Mathematics, Vol. 12, Springer Verlag, 2002.
- J. D. Hoffman, Numerical Methods for Engineers and Scientists, McGraw-Hill, 2001.
- M.K Jain, S.R.K Iyengar and R.K Jain, Numerical methods for scientific and engineering computation (Fourth Edition), New Age International (P) Limited, New Delhi, 2004.
- S. C. Chapra, Applied Numerical Methods with MATLAB for Engineers and Scientists, McGraw-Hill 2008.

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Shri Vaishnav Institute of Science

Department of Physics

Choice Based Credit System (CBCS)


B. Tech. (Common for All branches)

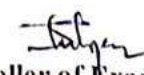
Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment *	End Sem University Exam	Teachers Assessment *				
BTPH101	DC	Applied Physics	60	20	20	30	20	3	1	2	5

Course Objectives	<ol style="list-style-type: none"> 1. To develop the comprehensive understanding of laws of physics. 2. To develop ability to apply laws of physics for various engineering applications. 3. To develop the experimental skills, ability to analyze the data obtained experimentally to reach substantiated conclusions.
Course Outcomes	<ol style="list-style-type: none"> 1. Student will be able to comprehend laws of physics. 2. Student will be able to apply laws of physics for various engineering applications. 3. Student will be able to determine physical parameter experimentally and will be able to analyze the data obtained experimentally to draw substantiate conclusions.

Abbreviation		Teacher Assessment (Theory) shall be based on following components: Quiz / Assignment/ Project / Participation in class (Given that no component shall be exceed 10 Marks).
Th	Theory	
T	Tutorial	
P	Practical	Teacher Assessment (Practical) shall be based on following components: Viva / File / Participation in Lab work (Given that no component shall be exceed 50% of Marks).


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Choice Based Credit System (CBCS)

BTPH101: Applied Physics

UNIT I: Quantum Physics

Introduction to Quantum hypothesis, Matter wave concept, Wave Group and Particle velocity and their relations, Uncertainty principle with elementary proof and applications to microscope and single slit, Compton Effect, Wave function and its physical significance, Development of time dependent and time independent Schrodinger wave equation, Applications of time independent Schrodinger wave equation.

UNIT II: Solid State Physics

Free electron model, Qualitative Analysis of Kronig Penney Model, Effective mass, Fermi level for Intrinsic and Extrinsic semiconductors, P-N junction diode, Zener diode, Tunnel diode, Photodiode, Solar-cells, Hall Effect, Introduction to Superconductivity, Meissner effect, Type I & II Superconductors.

UNIT III: Nuclear Physics


Nuclear Structure & Properties Nuclear models: Liquid drop with semi-empirical mass formula & shell model. Particle accelerators: Cyclotron, Synchrotron, Betatron. Counters and Detectors: Giger-Muller counters, Bainbridge Mass Spectrograph and Auston Mass Spectrograph.

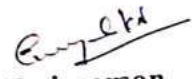
UNIT VI: Laser & Fiber Optics


Stimulated and Spontaneous Emission, Einstein's A&B Coefficients, Population Inversion, Pumping, Techniques of Pumping, Optical Resonator, Properties and Applications of Laser, Ruby, Nd:Y AG, He-Ne lasers. Introduction to Optical fibre, Acceptance angle and cone, Numerical Aperture, V-Number, Ray theory of propagation through optical fibre, Pulse dispersion, applications of optical fibre.

UNIT V: Wave Optics

Introduction to Interference, Fresnel's Bi-prism, Interference in Thin films, Newton's rings experiment, Michelson's interferometer and its application, Introduction to Diffraction and its Types, Diffraction at single slit, double slit, resolving power, Rayleigh criterion, Resolving power of grating, Concept of polarized light, Double refraction, quarter and halfwave plate, circularly & elliptically polarized light.


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Choice Based Credit System (CBCS)
BTPH101: Applied Physics

REFERENCES

1. "Engineering Physics", by Dr. S. L. Gupta and Sanjeev Gupta, Dhanpat Rai Publication, New Delhi.
2. "Engineering Physics", by Navneet Gupta, Dhanpat Rai Publication, New Delhi.
3. "Engineering Physics", by H. J Sawant, Technical Publications, Pune, Maharashtra.
4. "Engineering Physics". by MN. Avdhanulu & P. G. Kshirsagar, S. Chand & Co. Edition (2012).
5. "Fundamentals of Physics", by Halliday, Wiley, India.
6. "Concepts of Modern Physics", by Beiser, TMH, New Delhi.
7. "Atomic and Nuclear physics", by Brijlal and Subraminayan.
8. "LASERSs and Electro Optics". by Christopher C. Davis, Cambridge Univ. Press (1996).
9. "Optoelectronics an Introduction", by J Wilson & JF.B.Hawkes, "" Prentice-Hall II Edition.
10. "LASER theory and applications", by A. K. Ghatak & Tyaga raja n, TMH (1984).


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BTPH101: Applied Physics

List of experiments

1. Measurement of radius of curvature "R" of convex lens by Newton's ring experiment.
2. Measurement of Numerical aperture of fiber by LASER.
3. Determination of Energy band gap .Eg" of Ge using Four Probe method.
4. Measurement of Frequency of A.C. mains by electrically maintained vibrating rod.
5. Measurement of Resolving Power of Telescope.
6. Measurement of "A" of LASER light source using Diffraction Grating.
7. Determination of Planck's constant by using photocell.
8. Determination of Energy band gap (Eg) using PN Junction Diode.
9. To determine the mass of cane sugar dissolved in water using half shade polarimeter.
10. To study forward and reverse characteristics of Zener diode.
11. To study forward and reverse characteristics of P-N diode.
12. To study characteristics of Photo diode.
13. To study characteristics of LDR.
14. μ and ω of given prism using spectrometer.
15. Measuring height of a given object using Sextant.


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Choice Based Credit System (CBCS) Scheme in light of NEP-2020
B. Tech/B.Tech+MBA in Mechanical Engineering
(2023-2027) Revised Syllabus

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*				
BTME105	BEC	FUNDAMENTALS OF MECHANICAL ENGINEERING AND APPLIED MECHANICS	60	20	20	30	20	3	0	2	4

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):

The objective of the course is to develop basic knowledge of (A) engineering materials (B) thermodynamics, I.C. engines & boilers (C) Forces and Equilibrium (D) centroid & moments of inertia.

Course Outcomes:

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes:

1. Student would be able to understand the need of engineering materials and its properties.
2. Student would be able to understand the basics of thermodynamics and boilers.
3. Student would be able to understand working principle of IC engines.
4. Students will be able to demonstrate various types of forces and their analysis.
5. Students will be able to calculate the centre of gravity and moment of inertia of different geometrical shaped figures.

Syllabus:

UNIT I

(8 Hrs)

Introduction to Engineering Materials: Introduction, Classification of Engineering Materials, Mechanical properties like strength, hardness, toughness, ductility, brittleness, malleability etc. of materials, Tensile Test-Stress-strain diagram of ductile and brittle materials, Hooks law and modulus of elasticity, Hardness, and Impact testing of materials, BHN etc.

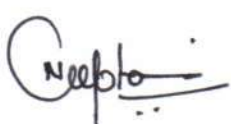
UNIT II

(9 Hrs)

Thermodynamics: Thermodynamic system, properties, state, process, Zeroth, First and second law of thermodynamics, thermodynamic processes at constant pressure, volume, enthalpy & entropy.

Steam & Boilers: Formation of steam, steam processes, classification and working of boilers, mountings and accessories of boilers, efficiency and performance analysis of boilers, height of chimney.


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UNIT III **(8 Hrs)**

IC Engines: Working principle of IC Engine, Terminology of IC engine, Carnot, Otto, and Diesel cycles P-V & T-S diagrams and its efficiency, working of two stroke & four stroke Petrol & Diesel engines.

Unit - IV **(10 Hrs)**

Forces and Equilibrium: Graphical and Analytical Treatment of Concurrent and non-concurrent, Co-planner forces, free Diagram, Force Diagram and Bow's notations, Types of supports and their reactions. Analysis of plane Trusses: Method of joints, Method of Sections. Frictional forces in equilibrium problems.

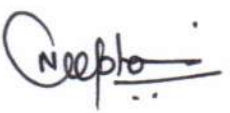
UNIT V **(10 Hrs)**

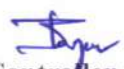
Centre of Gravity and moment of Inertia: Centroid and Centre of Gravity, Moment Inertia of Area and Mass, Radius of Gyration, Introduction to product of Inertia and Principle Axes. Support Reactions, Shear force and bending moment Diagram for Cantilever & simply supported beam with concentrated, distributed load and Couple.

Text and Reference Books:

1. "Basic Mechanical Engineering" by Dr. V. M. Domkundwar and S. S. Bhavikatti, Nirali Prakashan, 2018.
2. "Mechanical Engineering" by R.K. Rajput, S. Chand & Co. Delhi, 2019.
3. "An Introduction to Mechanical Engineering" by Jonathan Wickert and Kemper Lewis, CENGAGE Learning, 2012.
4. "Engineering Mechanics" by Shames and Rao, Pearson Edu(I), 2005.
5. "Engineering Mechanics (Statics & Dynamics)" by R.C. Hibler, Pearson Edu(I), 2015.
6. "A Text book of Applied Mechanics" by R.K. Rajput, Laxmi Pub. 2016.
7. "A Textbook of Engineering Mechanics" by R K Bansal, Laxmi Pub. 2005.


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(2023-2027) Revised Syllabus


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BTME105	BEC	FUNDAMENTALS OF MECHANICAL ENGINEERING AND APPLIED MECHANICS	60	20	20	30	20	3	0	2	4

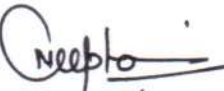
Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;


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List of Experiments:

1. To perform tensile test, plot the stress- strain diagram and evaluate the tensile property of a given specimen.
2. Study of different IC Engines.
3. Study of various types of Boilers.
4. Study of different types of Boilers Mountings and accessories.
5. Problems relating to centroid of composite areas.
6. Problems on moment of inertia, polar moment of inertia, radius of gyration, polar radius of gyration of composite areas.
7. Problems involving frictional forces.
8. Analysis of simple trusses by method of joints, method of sections & graphical method.
9. Problems on shear force and bending moment diagrams.


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BTME201	BEC	FUNDAMENTALS OF MECHANICAL MEASUREMENT	60	20	20	30	20	3	0	2	4

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Course Educational Objectives (CEOs):

1. Develop fundamental understanding of mechanical measurements
2. Impart knowledge of measurement concepts and their practice.
3. Develop knowledge of measurement errors and their causes.

Course Outcomes (COs):

After learning the course the students should be able to:

- (1). Students will describe basic concepts of mechanical measurement
- (2). Students will understand linear and angular measuring instrument for measurement of various components
- (3). Students will be able to measure force, torque and strain.
- (4). Students will be able to measure displacement, velocity, acceleration etc.
- (5). Students will be able to measure temperature, pressure and surface finish.

Syllabus

Unit - I

(10 Hrs)

Mechanical Measurement


Need of mechanical measurement, Basic Terminology and Definition: Hysteresis, Linearity, Resolution of measuring instruments, Threshold, Drift, Zero stability, loading effect and system response. Measurement methods, Generalized Measurement system, limit-gauging, various systems of limits, fits and tolerance, interchangeability, ISI and ISO system, basic principles and design of standards of measuring gauges; types of gauges and their design, accuracy and precision, calibration of instruments, principles of light interference, interferometer, measurement and calibration; Static performance characteristics, Errors and their classification.

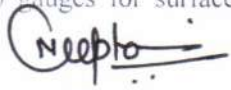
Unit – II


(9 Hrs)

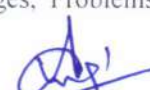
Linear and Angular Measurements:

Linear Measurement Instruments, Vernier calliper, Micrometer, Interval measurements: Slip gauges, checking of slip gauges for surface quality, Optical flat, Limit gauges, Problems on


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BTME201	BEC	FUNDAMENTALS OF MECHANICAL MEASUREMENT	60	20	20	30	20	3	0	2	4

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

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measurements with gauge. angular measuring instruments; sine bar, angle gauges; spirit level, autocollimators, clinometers; measurement of straightness, flatness and squareness.

Unit – III

(9 Hrs)

Measurement of Force, Torque and Strain:

Force measurement: load cells, cantilever beams, proving rings, differential transformers.

Measurement of torque: Torsion bar dynamometer, servo controlled dynamometer, absorption dynamometers, Power Measurements.

Measurement of strain: Mechanical strain gauges, electrical strain gauges, strain gauge: materials, gauge factors, theory of strain gauges and method of measurement, bridge arrangement, temperature compensation.

Unit – IV

(8 Hrs)

Displacement, Velocity/Speed, and Acceleration, Measurement:

Working principal of Resistive Potentiometer, Linear variable differential transducers, Electro Magnetic Transducers, Mechanical, Electrical and Photoelectric Tachometers, Piezoelectric Accelerometer, Seismic Accelerometer.

Unit - V

(9 Hrs)

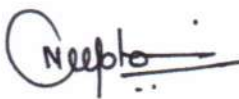
Temperature Measurement:

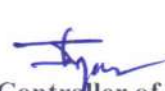
Temperature Measuring Devices: Thermocouples, Resistance Temperature Detectors, Thermistor, Liquid in glass Thermometers, Pressure Thermometers, Pyrometer, Bimetallic strip. Calibration of temperature measuring devices

Pressure Measurement: Relative pressure scales, pressure reference instruments, barometer, manometer, deadweight tester, pressure gauges and transducers etc.

Measurement of surface finish: Surface finish definitions, types of surface texture, surface roughness measurement methods, comparison, profile-meters, pneumatic and replica, measurement of run out and concentricity.


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Shri Vaishnav Institute of Technology and Science
Choice Based Credit System (CBCS) Scheme in light of NEP-2020
B. Tech/B.Tech+MBA in Mechanical Engineering
(2023-2027)

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*				
BTME201	BEC	FUNDAMENTALS OF MECHANICAL MEASUREMENT	60	20	20	30	20	3	0	2	4

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


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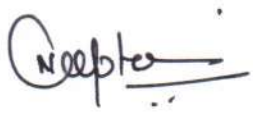
Text and Reference Books:


1. Engineering Metrology and Measurement, N V Raghavendra and Krishnamurthy, Oxford University Press, 2013.
2. Metrology and Measurement, Anand Bewoor & Vinay Kulkarni McGraw-Hill, 2009.
3. Instrumentation, Measurement and Analysis, B.C. Nakra, K.K. Chaudhry McGraw-Hill, 2017.
4. A course in Mechanical Measurements and Instrumentation, A K Sawhney, Dhanpat Rai Publications, 2005.
5. Mechanical Measurements and Instrumentations, Er. R K Rajput, Kataria Publication (KATSON), 2012.
6. Mechanical Measurement & Control by D.S. Kumar, Metropolitan Book Co. 2017.
7. Mechanical Measurement and Metrology by R K Jain, Khanna Publisher, 1994.

List of Experiments:

1. Basic understanding of measurements: concepts, application, advantage and future aspects
2. Linear measurement of various objects and check different characteristics of measurements.
3. Angular measurement of various objects and check different characteristics of measurements.
4. Temperature measurements and check different characteristics of measurements and also do calibration
5. Temperature measurements and calibration of thermocouple.
6. Performance on Stress, strain and force measurements and check different characteristics of measurements and also do calibration
7. Performance on Speed/Velocity, acceleration measurements.
8. Performance on surface measurements


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BTME202	DCC	MATERIALS SCIENCE AND ENGINEERING	60	20	20	0	0	3	0	0	3	

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

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Course Educational Objectives (CEOs):

- (A) To acquaint students with the knowledge of material science and engineering.
- (B) To impart a fundamental knowledge of materials geometry and structures.
- (C) To impart the knowledge alloy formation and phase transformation.
- (D) To impart the knowledge & understanding of heat treatment and testing of materials.

Course Outcomes (COs):

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

1. The students will be able to describe ferrous and non ferrous materials and its properties.
2. The students will be able to understand the material geometry and defects.
3. The students will be able to understand the alloy formation and phase transformation.
4. The students will be able to understand the heat treatment processes and their importance.
5. The students will be able to understand the material testing methods.

Syllabus

Unit-I

(10 Hrs)

Introduction: Scope & requirement of engineering materials, Classification, Properties of engineering materials, Ferrous materials & its alloys, Non-ferrous materials and its alloys, Effect of alloying elements on the mechanical properties of Steel & C.I., Material selection process.

Unit-II


(9 Hrs)

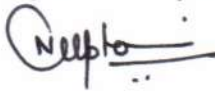
Crystal geometry and crystal defects: Space lattice, unit cell, different types of crystal structures, Bravais lattices, Atomic packing factor and density, crystal planes and directions, Defects in solids, Linear defects, Slip & plastic deformation, Planar defects, Volume defects, Volume defects.


Unit-III


(9 Hrs)

Theory of alloys and phase transformations: Basic terms, solid solutions, Phase rules, phase diagrams, time temperature cooling curves, equilibrium diagrams, eutectic system, eutectoid system, peritectic system, peritectoid system, rate of transformation, nucleation and growth,


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BTME202	DCC	MATERIALS SCIENCE AND ENGINEERING	60	20	20	0	0	3	0	0	3

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micro-constituents of iron-carbon system, Iron-Carbon Diagram, formation of austenite, TTT diagram.

Unit-IV

(8 Hrs)

Heat Treatment: Various applications of heat treatment, heat treatment process; Annealing, Normalizing, Hardening, Quenching, Tempering (Austempering, Martempering), and various case hardening processes, heat treatment furnaces, heat treatment defects.


Unit-V

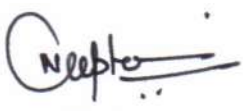
(9 Hrs)

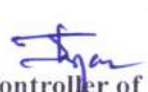
Material Testing: Various mechanical properties and their testing; tensile testing, Stress strain diagram, hardness testing, toughness testing, fatigue testing and creep testing etc. Overview of Destructive Testing and Non-Destructive testing (NDT), advantages and disadvantages of NDT


Text and Reference Books:

1. "Materials Science and Engineering", Callister W. D., John Wiley, 2008
2. "Engineering Metallurgy", Higgins R. A., Viva books Pvt. Ltd., 2004.
3. "Materials Science & Engg." Raghvan V., Prentice Hall of India, New Delhi. 2000.
4. "Material Science" G.K. Narula et al. McGraw Hill education (India) Pvt. Ltd, 2010.
5. "Science of Engineering Materials", Smith, Prentice-Hall, 2012.
6. "Introduction to Physical Metallurgy", Avner, S.H., Tata McGraw-Hill, 1997.
7. "Mechanical Metallurgy", Dieter, G.E., McGraw-Hill, 1988.
8. "Material Science and Metallurgy", U. C. Jindal, Pearson Edu., 2012.
9. "Material Science & Metallurgy for Engineers", Dr. V.D. Kodgire & S. V. Kodgire, Everest Publication, 2005.
10. "Mechanical Behavior & Testing of Materials", A. K. Bhargava, C.P. Sharma. P H I Learning Private Ltd., 2007.


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BTME103	BEC	WORKSHOP PRACTICES	0	0	0	30	20	0	0	2	1	

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Course Educational Objectives (CEOs):

To paraphrases with (A) workshop technology, industrial safety, and understand material properties. (B) Carpentry shop, fitting shop, (C) welding and casting.

Course Outcomes:

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes:

1. Student would be able to understand the need of workshop, technology related to it, and industrial safety and precautions.
2. Student would be able to use carpentry tools, analyses various wood joints and their properties.
3. Students would be able to use fitting tools to make various shapes and design.
4. Student would be able to recognize various welding techniques and their needs.
5. Students would be able to design various shapes by using casting technologies.

Syllabus:

UNIT I

(6 Hrs)

Introduction to Workshop Technology & Industrial Safety:

Workshop Technology: Introduction, need of workshop and types of workshop

Industrial Safety- Introduction, objective of industrial safety, causes of accidents, common sources of accidents, preventive measures, and common safety methods.


UNIT II

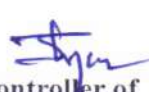
(6 Hrs)


Carpentry Shop:

Introduction, types of timbers, defects in timbers, timber prevention, characteristics of good timber, common tools used in carpentry shop (marking and measuring tools; cutting tools and striking tools), and common wood joints (cross-lap, corner-lap, dovetail and bridle joints).


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UNIT III **(6 Hrs)**

Fitting Shop:

Introduction, tools used in fitting shop (measuring tools, holding tools, cutting tools, striking tools and supporting tools) and operation performed in fitting work.

UNIT IV **(6 Hrs)**

Welding Shop:

Introduction, terminological elements of welding process, welding joints (lap joints and butt weld joint), welding positions, advantages and disadvantages of welding, classification of welding, gas welding processes and safety recommendation for gas welding.

UNIT V **(6 Hrs)**

Casting:

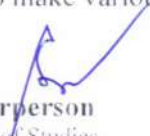
Pattern making and sand casting, Pattern materials, Types of pattern, Pattern allowances. Core prints. Moulding sand, ingredients, classification, sand additives, properties of moulding sand, sand preparation and testing. Green sand mould preparation. Cores and core making – Types of cores.

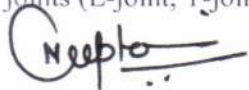
Text and Reference Books:


1. "Workshop Technology (Part-I)" by W.A.J. Chapman, CBS Pub, 2001.
2. "Production Technology (Vol-I)" by R.K. Jain, Khanna Publishers, 9th ed. 2019.
3. "Principles of Manufacturing Material & Process" by J.S. Campbell McGraw Hill, 1984.
4. "Welding: Principles & Practices" by Edward R. Bonhart, McGraw Hill Edu. India
5. "Welding and Welding Technology" by Richard L. Little, McGraw Hill, 2017.
6. "Principles of Foundry Technology" by P.L. Jain, McGraw Hill, 2017.
7. "Manufacturing Technology (Vol-I)" by P. N. Rao, McGraw Hill, 2017.
8. "Workshop Technology (Vol-I)" by B.S. Raghuvanshi, Dhanpat Rai & Co. 2015.

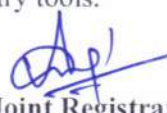
List of Experiments:

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.


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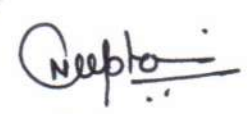
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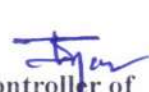
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4. To perform various fitting shop operations using fitting tools.
5. To study various welding methods and its safety precaution.
6. To make various welding joints (Butt joints, Lap, joints, corner joints, etc).
7. To study various types of patterns and pattern allowances.
8. To study properties of moulding sand and prepare a mould.
9. To study various types of cores and its application in casting.


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