Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Name of Program: Bachelor of Technology in Electronics & Communication

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCH101		Applied Chemistry	60	20	20	30	20	3	1	2	5

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 Objectives:-

1. To give basic knowledge of polymer science.
2. To understand and apply the knowledge of electro-chemistry and its laws.
3. To give basic knowledge of corrosion and control over it.
4. To understand the various sophisticated instrumental techniques.
5. To give basic knowledge of water, lubricants and different properties of water.

Course Outcomes:-

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

1. Theoretical understanding of various high polymers and their properties.
2. Became aware of the importance of electro-chemistry and its laws in the field of technology and dealing with its numerical approach.
3. Understanding metal corrosion and control over it.
4. Implementing instrumental techniques as powerful tool for qualitative and quantitative analysis of compounds.
5. Analyzing boiler feed water for industrial use and drinking water for domestic use.

Syllabus

Unit-I

Polymers and Reinforced Plastics:

Classification of polymers - types of polymerization reactions - mechanism of addition polymerization: free radical, ionic and Ziegler - Natta - effect of structure on the properties of polymers - strength, plastic deformation, elasticity and crystallinity -Preparation and properties of important resins: Polyethylene, PVC, PMMA, Polyester, Teflon, Bakelite and Epoxy resins.

Unit-II

Electrochemistry:

Arrhenius theory of electrolytic dissociation, Transport number, Kohlrausch's law, Solubility product, Redox reaction, Electrochemical and concentration cells.

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Corrosion and Its Control:
Corrosion: Basic concepts - mechanism of chemical, electrochemical corrosion - Pilling Bedworth rule – Types of Electrochemical corrosion - galvanic corrosion - differential aeration corrosion - pitting corrosion - stress corrosion – Measurement of corrosion (wt. loss method only) - factors influencing corrosion. Corrosion control: Cathodic protection - sacrificial anodic method – corrosion inhibitors, Protective coating.

Unit-III
Basic Instrumental Techniques:
Basic principles, instrumentation and applications of potentiometry, UV - visible spectroscopy, infrared spectroscopy, atomic absorption spectroscopy and flame photometry.

Unit-IV
Water Treatment
Water quality parameters: Physical, Chemical & Biological significance - Hardness of water - estimation of hardness (EDTA method) - Dissolved oxygen – determination (Winkler's method), Alkalinity - determination - disadvantages of using hard water in boilers: Scale, sludge formation - disadvantages - prevention - treatment: Internal conditioning - phosphate, carbon and carbonate conditioning methods - External: Zeolite, ion exchange,Lime Soda methods & Numericals- desalination - reverse osmosis and electrodialysis - domestic water treatment.

Lubricants:
Mechanism of lubrication, Classification of lubricants, Properties & testing of lubricating oil. Definition of viscosity of a liquid; Determination of Viscosity; Shear Viscosity; Intrinsic Viscosity; Molecular weight from Viscosity measurement & Numerical problems based on viscosity index.

Unit-V
Metal in Industry
Structure of coordination compounds corresponding to coordination number up to 6, Types of ligands, Isomerism [geometrical, optical, ionization, linkage and coordination], Theories of bonding in coordination compounds- crystal field theory, Valence bond theory, Chelation.

References:

1. Applied Chemistry – Theory and Practice, O.P. Viramani, A.K. Narula, New Age Pub.
2. Polymer Science – Ghosh, Tata McGraw Hill.
3. Chemistry for Environmental Engineering – Sawyer, McCarty and Parkin – McGraw Hill, International.
4. Basic Lubrication theory – Alistair Cameron
5. Engineering chemistry- Dr. Jyoti Mitna
6. Engineering chemistry- Dr. Sunita Ratan
7. Applied Chemistry – S.M. Khopkar
8. Polymer Science- V.R. Gowawriker
9. Introduction of polymer science- G.S. Mishra

List of experiments:

1. To estimate the strength of the given unknown solution of Mohr's salt (Ferrous ammonium sulphate (FeSO4(NH4)2SO4.6H2O) using KMnO4 solution as an intermediate.

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2. Estimation of hardness by EDTA method.
3. Conductometric titration - determination of strength of an acid
4. Estimation of iron by potentiometry.
5. Determination of molecular weight of polymer by viscosity average method
6. Determination of Na / K in water sample by Flame photometry (Demonstration)
7. Determination of total alkalinity and acidity of a water sample
8. Estimation of calcium ions present in tap water. (TDS)
9. To determine the viscosity of a given liquid (30% sugar solution) at room temperature using Ostwald's viscometer.
10. Testing of Flash point of lubricating oil by Pensky Martins apparatus.
11. To determine the viscosity index by Red wood Viscometer 1 & 2.

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Name of Program: Bachelor of Technology in Electronics & Communication

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTMA201		Applied Mathematics -II	60	20	20	0	0	3	1	0	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 Objective

To introduce the students with the Fundamentals of the Calculus of Matrices, Differential Equations and Numerical Analysis

Course Outcomes

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

1. Understand and apply the basics of the calculus of matrices.
2. Solve the fundamental problems of the ordinary differential equations.
3. Apply the advanced techniques to find the solution of the ordinary differential equations.
4. Know the techniques of the numerical analysis.
5. Find the numerical solution of the ODE and PDE.

Syllabus

UNIT – I
Calculus of Matrices
Systems of linear equations and their solutions. Matrices, determinants, rank and inverse. Linear transformations. Range space and rank, null space and nullity. Eigenvalues and eigenvectors. Similarity transformations. Diagonalization of Hermitian matrices. Bilinear and quadratic forms.

UNIT – II
Differential Equation
Ordinary Differential Equations: First order linear and nonlinear ordinary differential equations, exactness and integrating factors. Ordinary linear differential equations of n-th order, solutions of homogeneous and non-homogeneous equations. Operator method. Method of undetermined coefficients and variation of parameters.

UNIT – III
Differential Equation
Power series methods for solutions of ordinary differential equations. Legendre equation and Legendre polynomials, Bessel equation and Bessel functions of first and second kind.

UNIT – IV
Numerical Analysis
Interpolation and Curve Fitting: Introduction to Interpolation; Calculus of Finite Differences; Finite Difference and Divided Difference Tables; Newton-Gregory Polynomial Form; Lagrange Polynomial Interpolation; Theoretical Errors in Interpolation; Spline Interpolation; Approximation by Least Square Method. **Numerical Differentiation and Integration:** Discrete Approximation of

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Derivatives: Forward, Backward and Central Finite Difference Forms, Numerical Integration, Simple Newton-Cotes Rules: Trapezoidal and Simpson's (1/3) Rules; Weddle's Rule, Gaussian Quadrature Rules: Gauss-Legendre, Gauss-Laguerre, Gauss-Hermite, Gauss-Chebychev.

UNIT – V

Numerical Solution of ODE & PDE: Euler's Method for Numerical Solution of ODE; Modified Euler's Method; Runge-Kutta Method (RK2, RK4), Error estimate; Multistep Methods: Predictor-Corrector method, Adams-Moulton Method; Boundary Value Problems and Shooting Method; finite difference methods, numerical solutions of elliptic, parabolic, and hyperbolic partial differential equations.

Text Books:

1. G. Strang, Linear Algebra And Its Applications, 4th Edition, Brooks/Cole, 2006
2. S. L. Ross, Differential Equations, 3rd Edition, Wiley, 1984.
3. E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall, 1995.
4. W.E. Boyce and R.C. DiPrima, Elementary Differential Equations and Boundary Value Problems, 7th Edition, Wiley, 2001.
5. K. E. Atkinson, Numerical Analysis, John Wiley, Low Price Edition (2004).
6. S. D. Conte and C. de Boor, Elementary Numerical Analysis - An Algorithmic Approach, McGraw-Hill,2005.
7. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, Delhi

Reference Books:

1. E. Kreyszig, Advanced Engineering Mathematics, 9th Edition, Wiley, 2005.
2. R. G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 5th Ed, Wiley, 1999.
3. J. Stewart, Calculus: Early Transcendentals, 5th Ed, Thomas Learning (Brooks/ Cole), Indian Reprint, 2003.
4. J. Stoer and R. Bulirsch, Introduction to Numerical Analysis, 2nd Edition, Texts in Applied Mathematics, Vol. 12, Springer Verlag, 2002.
5. J. D. Hoffman, Numerical Methods for Engineers and Scientists, McGraw-Hill, 2001.
6. 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.
7. S. C. Chapra, Applied Numerical Methods with MATLAB for Engineers and Scientists, McGraw-Hill 2008.

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Name of Program: Bachelor of Technology in Electronics & Communication

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCE103	CE	Applied Mechanics	60	20	20	30	20	3	1	2	5

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 Students (A) Will Be Able to familiarize with different branches of mechanics (B) with emphasis on their analysis and application to practical engineering problems(C) efficiently & effectively (D)

Course Outcomes (COs):

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

The students will be able to

1. To apply knowledge of mathematics, science in engineering.
2. To identify, formulate, and solve engineering problems
3. Demonstrate various types of forces and their analysis.
4. Demonstrate shear force and bending moment on structural member i.e. beams
5. Demonstrate centre of gravity and moment of inertia determination of different geometrical shaped figures.

Syllabus

Unit-I

Static Forces: Introduction to Engineering Mechanics, Classification of Engineering Mechanics, Statistics, Dynamics, Kinematics, Kinetics etc. Fundamental Laws of Mechanics

Force, Pressure and Stress, Free Body Diagram , Bow's Notation, Characteristics and Effects of a Force, System of Forces, Resolution of a Force, Composition of Forces, Resultant / Equilibrant Force, Law of Parallelogram of Forces, Law of Triangle of Forces, Polygon Law of Forces, Lami's Theorem, Equilibrium of a Body Under Two / Three/More Than Three Forces. Law of Superposition of Forces.

Coplanar Concurrent Forces, Coplanar Non Concurrent Forces, Moment of a Force, Principle of Moments/ Varignon's Theorem, Parallel Forces, Resultant of Parallel Forces, Couple, Moment of a Couple, Resolution of Force into a Couple.

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Unit-II

Analysis of Framed Structure: Frame, Types of frame, Truss, Types of truss, Analysis of Truss, Various methods of Analyzing the truss, Numericals analysis of truss

Unit-III

CG and MI: Centroid, Centre of Gravity, Determination of Centroid of Simple Figures, Centroid of Composite Sections. Centre of Gravity of Solid Bodies. Area Moment of Inertia: Basic Concept of Inertia, Definition of Moment of Inertia, Theorems of Moment of Inertia, Radius of Gyration, Polar Moment of Inertia of Standard Sections, Moment of Inertia of Composite Section, Principal Moment of Inertia , Mass Moment of Inertia.

Unit-IV

Beams: Types of Beams: Simply Supported Beam, Overhanging Beam, Cantilever Beam. Types of Supports of a Beam or Frame: Roller, Hinged and Fixed Supports. Load on the Beam or Frame: Different Types of Loading. Support Reaction of a Beam, Shear force, Bending Moment, Pure bending.

Unit-V

Introduction to Dynamics: Overview of Dynamics, Basic Concepts and Terms Used in Dynamics, Motion, Types of Motion, Newton's Laws of Motion, Newton's Law of Gravitation.

References

1. Prasad I.B., Applied Mechanics, Khanna Publication.
2. Shesha Prakash and Mogaveer; Elements of Civil Engg & Engg. Mechanics; PHI
3. S.P,Timoshenko, Mechanics of stricture, East West press Pvt.Ltd.
4. R.C. Hibbler – Engineering Mechanics: Statics & Dynamics.
5. A. Boresi & Schmidt- Engineering Mechines- statics dynamics, Thomson` Books
6. R.K. Rajput, Engineering Mechanics S.Chand & Co

List of experiments:

1. To verify the law of Triangle of forces and Lami's theorem.
2. To verify the law of parallelogram of forces.
3. To verify law of polygon of forces
4. To find the support reactions of a given truss and verify analytically.
5. To determine support reaction and shear force at a given section of a simply Supported beam and verify in analytically using parallel beam apparatus.
6. To determine the moment of inertia of fly wheel by falling weight method.
7. To verify bending moment at a given section of a simply supported beam.
8. Study of Various Beams and their Loading conditions
9. Study of Newton's laws of motion
10. Study of Newton's law of Gravitation

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Name of Program: Bachelor of Technology in Electronics & Communication

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTEC101	EC	Introduction to Communication Engineering	60	20	20	30	20	3	1	2	5

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.

Syllabus

UNIT-I

Introduction of Communication Process: Communication System and its elements, Types of Communication media/channels and its characteristics, Types of Electronic Communication one-way, two-way, half duplex and full duplex, Electromagnetic Spectrum and its Bandwidth.
Classification of Signals & Systems, Fourier series analysis of signals, Time and Frequency Representation of signals, Spectrum & bandwidth of signals.

UNIT II

Transform & Modulation: Fourier Transform and its Properties, Transform of various elementary signals. Definition of Modulation and Demodulation, need of modulation, Classification of various Modulation scheme (Analog and Digital), Multiplexing & its types: TDM, FDM, CDM.

Unit III

Cellular System: Voice communication, Introduction to telephone instruments & signals, Basic telephone operation.
Basic of Cellular Systems, Operation of Cellular Systems, Analog & Digital Cellular Systems, Mobile technology evolution, Comparison of GSM & CDMA.

Unit IV

Introduction to Optical Communication: Optical fiber transmission and communication, History of optics, block diagram of Optical fiber communication system, principle of operation, types of optical fibers.

Unit V

Introduction to Satellite Communication: Basics of Radio waves, layers of atmosphere. Satellite communication, History of Satellites, Kepler's laws, Satellite orbits and geostationary satellites.

TEXT BOOKS

1. Wayne Tomasi: Advanced Electronic Communication Systems, 6th Edition, PHI.
2. B.P. Lathi: Modern Analog and Digital Communication System, 4th Edition, Wiley, 2010.
3. Taub Schilling and Saha: Principles of communication Systems, 4rd TMH, 2015.
4. Theodore S. Rappaport: Wireless Communications: Principles and Practice, 2nd Edition, Pearson, 2009.

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REFERENCE BOOKS

1. S Haykin: Communication Systems, 5th Edition, John Wiley and Sons Inc.
2. Robert L. Shrader: Electronic Communication, 6th Edition, Macmillan, 1991
3. Hwei P. Hsu: Schaum's Outline of Signals and Systems, 3rd Edition, McGraw-Hill, 2013.
4. Singh and Sapre: Communication Systems, 3rd Edition, TMH, 2017.

List of Experiments

1. Study of Function Generator.
2. Study of Various Signals on CRO and measurement of time period and frequency.
3. Synthesis of Signals using Fourier series.
4. Introduction to MATLAB/qtOctave.
5. Generation of Basic Signals using MATLAB/qtOctave.
6. Mathematical analysis of basic signal operations.
7. Analyze AM Signals using MATLAB/qtOctave.
8. Analyze Time Division Multiplexed signals.
9. Study of Optical Fibre Communication System.
10. Study analysis of serial communication.

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B. Tech. in Mechanical Engineering

(Revised Syllabus)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT *	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT *				
BTME102		FUNDAMENTALS OF MECHANICAL ENGINEERING	60	20	20	30	20	3	1	2	**5**

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 introduction with (A) Engineering Materials, (B) Thermodynamics, heat engines (C) Boiler and Steam (D) Refrigeration & Air conditioning, (E) Production.

Course Outcomes (COs):

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

1. Students would be able to understand the need of engineering materials, and its property, need and defects.
2. Students would be able to analyses basics of thermodynamics and able to understand various mechanical instruments.
3. Students would be able to understand I C engines, their working and operating conditions.
4. Students will be able to understand the basics of refrigeration & air conditioning.
5. Students would be able to recognize production methodology and their need.
6. Students would be able to demonstrate various case studies based on heat engines, basics of thermodynamics, productions.

Note: - Steam table is permit during examination.

Syllabus

Unit - I

Introduction to Engineering Materials: Introduction, classification materials, need of engineering materials, mechanical properties like strength, hardness, toughness, ductility, brittleness, malleability etc. of materials, Stress-strain diagram of ductile and brittle materials, Hooks law and Modulus of elasticity.

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Unit - II

Introduction to Thermodynamics: Definition of thermodynamics, thermodynamic systems, Macroscopic and Microscopic views, thermodynamic equilibrium, properties of system, point & path function, Zeroth, First and second law of thermodynamics, thermodynamic processes at constant pressure, volume, enthalpy & entropy.

Unit - III

Introduction to Heat Engines: Introduction, need of heat engines, types of heat engines.

IC Engines: Introduction, terminology of IC engine, Carnot, Otto and Diesel cycles P-V & T-S diagrams and its efficiency, two and four stroke engines, latest technologies used in engines of vehicle.

Boilers: Introduction, classification of boilers, working of Cochran, Lancashire, Locomotive and Babcock and Wilcox boilers, mountings & accessories.

Introduction of steam, steam formation, properties of steam, use of steam table.

Unit - IV

Introduction to Refrigeration: Introduction, need of refrigeration, reverse Carnot cycle, unit of refrigeration, coefficient of performance, Vapor compression cycle, P-h and T-S diagrams, deviations from theoretical cycle.

Air Conditioning: Introduction and need of air conditioning, air conditioning components and control.

Unit-V

Introduction to Manufacturing: Introduction of basic manufacturing process, introduction to casting, Rolling, Extrusion, Arc and Gas welding, Brazing, Soldering. Introduction to Lathe and Drilling machines and their various operations.

Reference Books:

1. *"Mechanical Engineering", by R. K. Rajput*
2. *"Basic Mechanical Engineering", by D. K. Gupta*
3. *"Basic Mechanical Engineering (MP",) by Domkundwar*
4. *"Mechanical Engineering", Handbook (CRC Press)*
5. *"Mechanical Engineering Reference Book", by E.H. Smith*
6. *"An Introduction to Mechanical Engineering", by Wickert/Lewis*
7. *"Engineering Fundamentals: An Introduction to Engineering:, by Moaveni*

List of Experiments

1. To perform tensile test, plot the stress-strain diagram and evaluate the tensile properties of a given metallic specimen.
2. To calculate Mechanical Advantage, Velocity ratio and efficiency of various temperature and pressure measuring devices and plot graphs.
3. To study Two-Stroke and Four-Stroke Diesel Engines.

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4. To study Two-Stroke and Four-Stroke Petrol Engines.
5. To study Cochran and Babcock and Wilcox boilers.
6. To study Lancashire and Locomotive boilers.
7. To study working and function of mountings and accessories in boilers.
8. To study the Refrigeration System.
9. To study the functioning of Window Room Air Conditioner.
10. To Study Lathe & Drilling Machines and various operation.
11. To perform Arc and Gas Welding operation on metal.

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Name of Program: Bachelor of Technology in Electronics & Communication

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTEC103		Electronics Workshop	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.

Course Objectives:-
This course will help the student to use and test different types of electronics components, different basic electrical and Electronics instruments used in electrical & electronics circuits and systems.

Course Outcomes:-
CO1 : To gain the Knowledge of Various electronics component.
CO2: Students will understand how to measures / characterize components through measuring instruments.
CO3: Students will test various electrical and electronics components, and measure circuit parameters.
CO4: Students will: Learn how to develop and employ circuit models for elementary electronic components

Syllabus

Unit-I
Cables and Switches: Differentiate various Cables, Connectors, Differentiate the various Switches& their usage. Connect and use cables, connectors and switches
Protective devices: Electrical Protective devices –fuses, relay and MCB

Unit-II
Electrical and Electronics Components: Resistors, capacitors, inductors and transformers. Integrated circuits and it Packaging Technique. Soldering technique, tools and PCB

Unit-III
Measuring Instruments: Overview of Voltmeter, Ammeter, Multimeter, CRO

Unit-IV

Electrical Drawing
WIRING DIAGRAM AND CONTROL CIRCUIT, point D. C. motor starter, point D.C. motor starter, DOL starter, Star delta starter, Auto Transformer Starter, Rotor resistance starter, Control of lamp from positions.

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List of experiments.

*Mentioned at least 10 Experiments.

1	Identify different types of cables & test it.
	Identify different types of connectors & Discover their application.
2	Identify different types of Switches and discover its usage.
	Identify different types of fuses & test it.
3	Identify different types of Relays and discover its usage.
4	Identify, find value using colour code chart and test different types
5	Identify, find value and test different types of capacitors.
6	Identify, find value and test different types of Inductors.
7	Connect Resister ,capacitor, inductor in series and parallel
8	Draw front panel control of analog and digital multimeter
9	Demonstrate external controls of CRO & function Generator.
10	Measure amplitude & frequencies of different sine waveform
11	Test resistor, capacitor, inductor, P-N junction Diode using CRO
12	Identify Various IC packages.
13	Identify various SMD components.

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B. Tech. in Mechanical Engineering

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
BTME103		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 20 marks.

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.

Corse Outcomes (COs):

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

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

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

Carpentry Shop Carpentry: 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

Fitting Shop Fitting: 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

Welding Shop Welding: 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

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.

Reference Books:

1. *"Production Technology", by R.K. Jain*
2. *"Principles of Manufacturing Material & Process", by Campbeu*
3. *"Welding: Principles & Practise", by Bonhart*
4. *"Welding and Welding Technology", by Little*
5. *"Principles of Foundry Technology", by Jain*
6. *"Manufacturing Technology", by P. N. Rao*
7. *"Workshop Technology", by B.S. Raghuvanshi*

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.

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