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

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BTMA101		Applied Mathematics I	60	20	20	-	-	3	1	-	4

Course Objective

To introduce the students with the Fundamentals and Applications of the Differential, Integral, Vector Calculus and Numerical Analysis

Course Outcomes

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

1. *Understand and apply the concepts of the differential and integral calculus.*
2. *Apply and simplify the techniques/problems in the numerical analysis.*
3. *Discuss the numerical solution of the system of linear algebraic equations.*
4. *Understand, analyse and apply the basics of the vector calculus.*

Course Content:

UNIT – I
Differential Calculus
Limits of functions, continuous functions, uniform continuity, monotone and inverse functions. Differentiable functions, Rolle's theorem, mean value theorems and Taylor's theorem, power series. Functions of several variables, partial derivatives, chain rule, Tangent planes and normal. Maxima, minima, saddle points, Lagrange multipliers, exact differentials

UNIT – II
Integral Calculus
Riemann integration, fundamental theorem of integral calculus, improper integrals. Application to length, area, volume, surface area of revolution. Multiple integrals with application to volume, surface area, Change of variables.

UNIT – III
Numerical Analysis

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

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BTMA101		**Applied Mathematics I**	60	20	20	-	-	3	1	-	4

Number Representation and Errors: Numerical Errors; Floating Point Representation; Finite Single and Double Precision Differences; Machine Epsilon; Significant Digits. **Numerical Methods for Solving Nonlinear Equations:** Method of Bisection, Secant Method, False Position, Newton-Raphson's Method, Multidimensional Newton's Method, Fixed Point Method and their convergence.

UNIT – IV
Numerical Analysis
Numerical Methods for Solving System of Linear Equations: Norms; Condition Numbers, Forward Gaussian Elimination and Backward Substitution; Gauss-Jordan Elimination; FGE with Partial Pivoting and Row Scaling; LU Decomposition; Iterative Methods: Jacobi, Gauss Seidel; Power method and QR method for Eigen Value and Eigen vector.

UNIT – V
Vector Calculus
Gradient and directional derivative. Divergence and Curl of Vector point function, line and surface integrals. Green's, Gauss' and Stokes' theorems and their applications.

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).
- B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, Delhi

References:

- R. G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 5th Ed, Wiley, 1999.
- J. Stewart, Calculus: Early Transcendentals, 5th Ed, Thomas Learning (Brooks/ Cole), Indian Reprint, 2003.
- 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.

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Shri VaishnavVidyapeethVishwavidyalaya, Indore
Shri Vaishnav Institute of Science
Name of Program: B.Tech. (All streams)
(2021-2025)

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*				
BTCH101	BEC	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 Educational Objectives (CEOs):
The subject aims to provide the student with:
1. To bring adaptability to new developments in Engineering Chemistry to acquire the skills required to become a perfect engineer.
2. To include the importance of water analysis and treatment in industrial usage, significance of corrosion control to protect the structures, structure, and applications of electrochemical cells.
3. To acquire required knowledge about engineering materials like cement, refractories, and lubricants and to understand the instrumentation techniques used in industries.
4. To acquaint the students with practical knowledge of the basic concepts of chemistry.

Course Outcomes (COs):
1. Students will gain the basic knowledge of chemical procedures related to polymerization, redox reactions and corrosion and its control.
2. They learn the use of fundamental principles to make predictions about the general properties of materials like lubricants, cement and refractories and the instrumentation techniques used in industries.
3. They can understand the basic properties of water and its treatment to overcome the boiler related problems in industries and power plants.
4. They can predict potential applications of chemistry and practical utility to become good engineers and entrepreneurs.

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 - compounding of plastics - moulding methods - injection, extrusion, compression.

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Shri Vaishnav Institute of Science
Name of Program: B.Tech. (All streams)
(2021-2025)

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*				
BTCH101	BEC	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.

Unit-II

(A) ELECTROCHEMISTRY

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

(B) 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 coatings: surface preparation for metallic coatings - electro plating (copper plating) and electroless plating (Nickel plating) - chemical conversion coatings - anodizing, phosphating & chromate coating.

Unit-III

BASIC INSTRUMENTAL TECHNIQUES

Basic principles, instrumentation, and applications of UV - visible spectroscopy, Infrared spectroscopy, and flame photometry. General introduction of Chromatography.

Unit-IV

WATER ANALYSIS AND 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.

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Name of Program: B.Tech. (All streams)
(2021-2025)

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*				
BTCH101	**BEC**	**Applied Chemistry**	60	20	20	30	20	3	1	2	5

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

(A) 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.

(B) ENGINEERING MATERIALS

Cement and Refractories.

References

1. Engg. Chemistry- Rath cengage learning.
2. Chemistry for Environmental Engineering – Sawyer, McCarty and Parkin McGraw Hill, International.
3. Basic Lubrication theory – Alistair Cameron
4. Engineering chemistry- Dr. Jyoti Mitna
5. Engineering chemistry- Dr. Sunita Ratan
6. Applied Chemistry – S.M. Khopkar
7. Polymer Science- V.R. Gowawriker
8. Introduction of polymer science – G.S. Mishra.

List of Experiments

Exp. 01. To estimate the strength of the given unknown solution of Mohr's salt (Ferrous ammonium sulphate ($FeSO_4(NH_4)_2SO_4.6H_2O$) using $KMnO_4$ solution as an intermediate.

Exp.02 Estimation of hardness by EDTA method.

Exp.03. Conductometric titration - determination of strength of an acid.

Exp.04. Estimation of iron by potentiometry.

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCH101	BEC	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.

Exp.05. Determination of molecular weight of polymer by viscosity average method.

Exp.06. Determination of Na / K in water sample by Flame photometry (Demonstration).

Exp.07. Determination of total alkalinity and acidity of a water sample.

Exp.08 Estimation of calcium ions present in tap water. (TDS).

Exp.09 To determine the viscosity of a given liquid (30% sugar solution) at room temperature

- using Ostwald's viscometer.

Exp.10 Testing of Flash point of lubricating oil by Pensky Martins apparatus.

Exp.11 To determine the viscosity index by Red wood Viscometer 1 & 2.

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Choice Based Credit System (CBCS) Scheme in light of NEP-2020

B. Tech/B.Tech+MBA in Mechanical Engineering

(2021-2025)

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*				
BTME101	BEC	ENGINEERING DRAWING	60	20	20	30	20	2	0	4	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):
To familiarize with concepts of (A) scale, conic sections and engineering curves (B) projections of points and line in all quadrants; (C)construction of geometrical figures& solids, with its orientation on horizontal and vertical planes, and its projection; section of solid, (D)development of solid and isometric projection view.

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 draw scale, conic sections and engineering curves.
2. Student would be able to draw projection of point and line; identify the use of these concepts in practical life.
3. Students would be able to understand plain & 3D model at various orientations and draw their projection.
4. Student would be able to draw the projections of with and without sectioning of solid models and surface development.
5. Students would be able to understand the difference between orthographic view and isometric projections.

Syllabus:

UNIT I **(8 Hrs)**

Scales, Conic Section & Engineering Curves Scales: Representative Factor, types of scales, principle and construction of different scales

Conic Section: Construction of ellipse, parabola and hyperbola by different methods; Normal and Tangent

Engineering Curves: Cycloid, Epicycloids, Hyper cycloid, Involutes, Archimedean and Logarithmic spirals

UNIT II **(9 Hrs)**

Projection of Points & Line Projection: Introduction to projection, Types of projection, terminology, first angle and third angle

Projection of Points: Introduction of point, conventional representation

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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*				
BTME101	BEC	ENGINEERING DRAWING	60	20	20	30	20	2	0	4	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.

Projection of Lines: Introduction of straight line, orientation of straight line, true inclination and true length, concepts of end projectors, plan and traces and auxiliary planes.

UNIT III **(9 Hrs)**

Projections of Planes: Introduction of planes, types of planes, orientation of planes, projection of planes in different positions, traces of planes

Projection of Solids: Introduction of solids, classification of solids, recommended naming of corners of solids, orientation of solids

UNIT IV **(8 Hrs)**

Section of Solids: Introduction of section of solids, terminology, types of section planes, section of prisms, section of pyramid and section of composite solids

Development of Surfaces: Introduction of development of surfaces, classification of surfaces, methods of development, development of prisms, pyramids, cylinder and cone, anti-development

UNIT V **(7 Hrs)**

Isometric Projections: Introduction of isometric projection, terminology, isometric projections and isometric views, isometric views of planes, right solids, truncated solids and composite solids.

Text and Reference Books:

1. "Engineering Graphics" by P.I. Varghese, McGraw Hill Edu., 2012.
2. "Engineering Drawing and graphics" by K. Venugopal, New Age (I) Pub., 2004.
3. "Engineering Drawing" by N.D. Bhatt, Charotar Publishing House, 2014.
4. "Engineering Drawing" by Basant Agarwal & C.M. Agarwal, McGraw Hill Edu., 2013.
5. "Engineering Drawing" by P.S. Gill, S.K. Kataria & Sons, 2013.

List of Experiments:

1. Drawing various types of scales using representative fraction.
2. Drawing various conics section.
3. Projection of points in all quadrants.
4. Projection of straight lines in all quadrants in various orientations.

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B. Tech/B.Tech+MBA in Mechanical Engineering

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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*				
BTME101	BEC	**ENGINEERING DRAWING**	60	20	20	30	20	2	0	4	**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.

5. Projection of geometrical planes with various orientations.
6. Projection of solid models with various orientations.
7. Projection of section of solids by using various types of cutting planes.
8. Drawing development of surface using various methods of prisms, pyramids, cone, cylinder, etc.
9. Drawing anti- development of surfaces.
10. Drawing isometric projections using various methods and isometric views.

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Choice Based Credit System (CBCS) in the Light of NEP-2020
B.Tech.
(2021-2025)

COURSE CODE	CATE-GORY	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*				
BTEE106		Fundamentals of Electrical and Electronics Engineering	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):

1. To impart the basic knowledge about the Electric and Magnetic circuits.
2. To explain the working principle, construction, applications of Transformers, DC machines and AC machines.
3. To understand the concept of diode, and transistors.

Course Outcomes (COs):

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

1. Apply knowledge of mathematics to analyze and solve electrical circuit problems.
2. Illustrate basic knowledge about the Electric and Magnetic circuits.
3. Distinguish the working Principles of various Electrical Machines.
4. Understand the concept of diodes and transistors.

Syllabus

UNIT I **8 Hrs.**

DC Circuits: Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems.

AC Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), Three-phase balanced circuits, voltage and current relations in star and delta connections.

UNIT II **9 Hrs.**

Magnetic Circuits: Basic definitions, self-inductance and mutual inductance, energy in linear magnetic systems, coils connected in series, AC excitation in magnetic circuits, magnetic field produced by current carrying conductor, Force on a current carrying conductor. Induced voltage, laws of electromagnetic Induction, direction of induced E.M.F.

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COURSE CODE	CATE-GORY	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*				
BTEE106		Fundamentals of Electrical and Electronics Engineering	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.

Single phase transformer: General construction, working principle, e.m.f. equation, equivalent circuits, phasor diagram, voltage regulation, losses and efficiency, open circuit, and short circuit test

UNIT III **8 Hrs.**

Electrical Machines: Construction, Classification & Working Principle of DC machine, induction machine and synchronous machine. Working principle of 3-Phase induction motor, Concept of slip in 3- Phase induction motor, Explanation of Torque-slip characteristics of 3-Phase induction motor. Types of losses occurring in electrical machines. Applications of DC machine, induction machine and synchronous machine.

UNIT IV **8 Hrs.**

PN Junction diode: Principle of operation, V-I characteristics, Junction breakdown, Avalanche breakdown, various types of diodes: Zener diode, Schottky diode, PIN diode, varactor diode, Zener diode as voltage regulator

Rectifier: Half wave rectifier and Full wave rectifier.

UNIT V **9 Hrs.**

Bipolar Junction Transistors: PNP and NPN transistors, Principle of operation, Ebers-Moll model, early effect, CB, CC, CE configuration and its input and output characteristics, transistor as an amplifier.

Textbooks:

1. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
2. D.P Kothari, I.J Nagrath, "Basic Electrical and Electronics Engineering" , McGraw Hill Education (India) Private Limited, Second Edition 2020.
3. Boylestad and Nashelsky, "Electronic Devices and Circuit Theory", Pearson Education,11th Edition, 2013.

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COURSE CODE	CATE-GORY	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*				
BTEE106		Fundamentals of Electrical and Electronics Engineering	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.

References:

1. V.N Mittal & Arvind Mittal, " Basic Electrical Engineering", TMH, Second Edition.
2. R.K Rajput, "Basic Electrical and Electronics Engineering" , University Science Press, Second Edition 2012.
3. J.B Gupta, " Electronic Devices and Circuit", S.K. Kataria & Sons, ,2013.

List of Experiments:

1. Verification of KCL and KVL.
2. Separation of resistance and inductance of choke coil.
3. Study of Transformer and its name plate rating.
4. Determination of Turns ratio and polarity of Single-Phase Transformer.
5. Determination of circuit parameters of a single-phase transformer by O.C. and S.C. tests.
6. Measurement of power in a three-phase circuit by two wattmeter methods.
7. Measurement of various line & phase quantities for a 3-phase circuit.
8. Study of No-load characteristics of D.C shunt Generators.
9. To determine and analyse the V-I characteristics of PN Junction diode and Zener Diode.
10. To determine input and output characteristics of transistor amplifiers in CE, CC and CB configurations.

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Choice Based Credit System (CBCS) in Light of NEP-2020
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(2021-2025)

COURSE CODE	CATE-GORY	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*				
BTCE 101	BCE	Fundamentals of Civil Engineering	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 students (A) will be able to identify various Civil Engineering aspects (B) with emphasis on Civil Engineering materials, various surveys, and major structures in Civil Engineering (C) efficiently & effective (D).

Course Outcomes (COs):
The student will be able to understand.

1. Understand identify various building materials.
2. Perform various surveys required to carry Civil Engineering work.
3. Identify various aspects of remote sensing.
4. Get knowledge about various aspects of road and dam.

Syllabus

UNIT I **08 Hrs.**
Building Material: Introduction, types, properties and uses of stones, bricks, cement, lime, mortar, concrete, and timber; Nominal proportion of concrete, preparation of concrete, compaction, and curing.

UNIT II **08 Hrs.**
Construction Element: Elements of building construction, types, and suitability; Introduction to foundations and footings, brick masonry walls, floors, roofs, doors, windows, lintels, staircases.

UNIT III **09 Hrs.**
Surveying: Introduction to surveying instruments, - Auto level, Theodolites and Plane table; Measurement of distances by traversing; Measurement of elevations by rise & fall and height of instrument method; Reciprocal levelling.

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(2021-2025)

COURSE CODE	CATE-GORY	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*				
BTCE 101	BCE	Fundamentals of Civil Engineering	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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UNIT IV **08 Hrs.**

Contour and Contouring: Introduction to contours; Methods of contouring; Measurement of areas, volumes; Application of measurements in quantity computation

UNIT V **09 Hrs.**

Advance Surveying Methods- Introduction to Electronic distance measurement (EDM); Introduction of remote sensing and its applications.
Earthquake Engineering General concepts of earthquake and earthquake resistant structures.

Textbooks:

1. Ramamrutam & R. Narayanan; Basic Civil Engineering, Dhanpat Rai Publishing Company Private Limited-New Delhi.
2. S.C. Rangwala; Building Construction, Charotar Publishing House Pvt. Ltd.
3. B.C. Punmia; Surveying – Volume – I, Laxmi Publications.

Reference Books:

1. S.K. Duggal; Building Materials, New Age Publishers
2. Gopi; Global Positioning System Principles and application, McGraw Hill Education.
3. General Concepts of Earthquake Engineering, NICEE Publication.

List of Practical's:

1. Determination of fineness of cement by dry sieving.
2. Determination of consistency of standard cement paste
3. Determination of setting time of standard cement paste
4. Determination of compressive strength of cement.
5. Determination of water absorption and compressive strength of brick.
6. Sieve analysis of coarse and fine aggregates.
7. Measurement of distance by ranging and chaining.
8. Traverse surveying with prismatic compass
9. Levelling using Auto level.

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			THEORY			PRACTICAL		L	T	P	CREDITS
			ENDSEM University Exam	Two Term Exam	Teachers Assessment*	ENDSEM University Exam	Teachers Assessment*				
BTCS101	BEC	COMPUTER PROGRAMMING-I	0	0	0	30	20	0	0	2	1

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

1. To introduce the fundamental concepts of computer programming.
2. To design programs in C involving different data types, decision structures, loops and functions, arrays and pointers.
3. To equip students with techniques for developing structured computer programs.
4. To equip students with sound skills in C/C++ programming language.

Course Outcomes:

Upon completion of the course, students will be able to:

1. Understand the basic terminologies used in computer programming.
2. Be proficient in using the basic constructs of C/C++, to develop a computer program.
3. Understand the use of functions, pointers, arrays and files in programming.
4. Understand the fundamentals of object-oriented programming and be able to apply it in computer program development.

Syllabus

Unit - I

Introduction to Programming Languages: Introduction to Programming Language; Types of Programming Languages – Machine-level, Assembly-level and High-level Languages, Scripting Languages, Natural Languages, Advantages and Limitations of programming language, High-

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COURSE CODE	CATEGORY	COURSE NAME	TEACHING&EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			ENDSEM University Exam	Two Term Exam	Teachers Assessment*	ENDSEM University Exam	Teachers Assessment*				
BTCS101	BEC	COMPUTER PROGRAMMING-I	0	0	0	30	20	0	0	2	1

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level Programming Language Tools – Compiler, Linker, Interpreter, Intermediate Language Compiler and Interpreter, Editor, MATLAB, GUI, Overview of some popular High level Languages – FORTRAN, COBOL, BASIC, Pascal, C, C++, JAVA, LISP, Characteristics of a Good Programming Language.

Unit - II

Design of Program: Introduction to Algorithms, Complexities and Flowchart, Introduction to Programming, Categories of Programming Languages, Program Design, programming language processing, Algorithm / pseudo code, program development steps, selecting a Language out of many Available Languages for Coding an Application, Subprograms and subroutines.

Unit - III

Basics of C language : Introduction to C language, Basic Programming concepts, Program structure in C ,header files, C preprocessor, Variables and Constants, Data types, User Defined Data Types – Structure and Union, Conditional statements, control statements, Functions, Arrays, Structures, pointers, strings, File Systems, c preprocessor and macro expansion.

Structure of C program, Expressions, type conversion, selection making decisions, initialization and updating, loops in C, Standard Library functions, Control Structures, Loop Structures, Functions, Scope Rule of Functions, Calling Convention, Advanced Features of Functions.

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			THEORY			PRACTICAL		L	T	P	CREDITS
			ENDSEM University Exam	Two Term Exam	Teachers Assessment*	ENDSEM University Exam	Teachers Assessment*				
BTCS101	BEC	COMPUTER PROGRAMMING-I	0	0	0	30	20	0	0	2	1

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Unit - IV

C Programming : Arrays - Pointers and arrays, two-dimensional arrays, arrays of pointer, String Manipulation functions, Structures & Unions, Processing and use of structures, arrays of structure.

Pointers - Operations on Pointers, Pointers and Multidimensional Arrays, Array of pointers, pointers to pointers, bitwise operators, and dynamic memory managements functions.

Files - File creation, File processing, Opening and closing a file, text files and binary files, streams, error handling.

Unit - V

C++ Programming: Introduction to C++, Tokens, expressions and control structures, Functions in C++, Basic principles of Object Oriented Programming.

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			THEORY			PRACTICAL		L	T	P	CREDITS
			ENDSEM University Exam	TwoTerm Exam	Teachers Assessment*	ENDSEM University Exam	Teachers Assessment*				
BTCS101	BEC	COMPUTER PROGRAMMING-I	0	0	0	30	20	0	0	2	1

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

1. Fundamentals of Computers: E Balagurusamy, TMH
2. Fundamentals of Computers: V Rajaraman, PHI
3. Yashavant P. Kanetkar. "Let Us C", BPB Publications, 2011.
4. Robert Lafore, "Object Oriented Programming in C++", SAMS Publication.

References:

1. Byron S Gottfried, "Programming with C", Schaum's Outlines, Second Edition, Tata McGraw-Hill, 2006
2. Herbert Schildt, "The Complete Reference", 4th Edition, MGH Publication.
3. Dromey R.G., "How to Solve it by Computer", Pearson Education, Fourth Reprint, 2007

Practical's List:

1. Study of procedural programming paradigm and object-oriented programming paradigm.
2. To demonstrate use of data types.

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			ENDSEM University Exam	TwoTerm Exam	Teachers Assessment*	ENDSEM University Exam	Teachers Assessment*				
BTCS101	BEC	COMPUTER PROGRAMMING-I	0	0	0	30	20	0	0	2	1

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3. Write a program on operators (Arithmetic Operator, Relational Operators and Conditional Operators etc.).

4. Write a program using decision making statements (switch case, if and if-else, nested structures).

5. Write a program using simple loops and nested loops.(For, While, Do-While Loop)

6. Write a program to user defined functions using C.

7. Write a program for recursive functions.

8. Write a program for array and multidimensional array (2-d arrays).

9. Write a program of pointers and strings (strings and pointers).

10. Write a program of dynamic memory allocation using calloc(), malloc() and realloc().

11. Write a program on structure and union.

12. Write a program in C++ using (i) if-then-else (ii) loops

13. Write a program illustrate Function in C++

14. Write a program for Operator overloading in C++.

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			ENDSEM University Exam	Two Term Exam	Teachers Assessment*	ENDSEM University Exam	Teachers Assessment*				
BTCS101	BEC	COMPUTER PROGRAMMING-I	0	0	0	30	20	0	0	2	1

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15. Write a program for nested function call.
16. Write a program of call by value using C++
17. Write a program of call by reference using C++
18. Write a program for Inline Function.
19. Write a program for Friend Function.
20. Write a program of dynamic memory management using new and delete.
21. Write a program on file handling using C++ .

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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*				
BTME103	BEC	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.

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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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTME103	BEC	**WORKSHOP PRACTICES**	0	0	0	30	20	0	0	2	**1**

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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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, 19th 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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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTME103	BEC	**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.

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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