



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## Name of Program: Bachelor of Technology in Electronics & Communication

SUBJECT CODE	Cate-gory	SUBJECT 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*				
<b>BTEE102</b>		<b>Fundamentals of Electrical Engineering</b>	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 DC machines, AC machines.

### Course Outcomes(CO's):-

Students will be able to:

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

### Syllabus

#### UNIT I

**8 Hrs.**

**Electrical circuit analysis-** Definition of electric circuit, network, linear circuit, non-linear circuit, bilateral circuit, unilateral circuit. Kirchoff's law. Voltage and current sources, dependent and independent sources, source conversion, DC circuits analysis using mesh & nodal method, Thevenin's theorem, Norton's theorem, Superposition theorem, star-delta transformation.

#### UNIT II

**8 Hrs.**

**A C Fundamentals-** Production of alternating voltage, waveforms, average and RMS values, peak factor, form factor, phase and phase difference, phasor representation of alternating quantities, phasor diagram, behavior of AC series, parallel and series parallel circuits, power factor, power in AC circuit, 1-phase AC circuits under sinusoidal steady state, active, reactive and apparent power, physical meaning of reactive power, power factor, 3-phase balanced and Unbalanced supply, star and delta connections.

#### UNIT III

**9 Hrs.**

**Electromagnetism:** Biot-savart law, Ampere's circuital law, field calculation using Biot-savart and ampere's circuital law. Magnetic circuits, Analogous quantities in magnetic and electric circuits, Faradays's law, self and mutual inductance. Energy stored in a magnetic field, Hysteretic and Eddy current losses. Electro-mechanical energy conversion.



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## UNIT IV

9 Hrs.

**Transformers**-Review of laws of electromagnetism, mmf, flux, and their relation, analysis of magnetic circuits. Single-phase transformer, basic concepts and construction features, voltage, current and impedance transformation, equivalent circuits, phasor diagram, voltage regulation, losses and efficiency, OC and SC test.

## UNIT V

9 Hrs.

**Basic concepts of Rotating Electric machines**- Constructional details of DC machine, Basic concepts of winding (Lap and wave). Principle of operation, EMF equation, characteristics (open circuit, load). DC motors: Principle of operation, Speed-torque Characteristics (shunt and series machine), starting (by 3 point starter), speed control (armature voltage and field control). Induction machine and Synchronous machine, Working principle of 3-Phase Induction motor, Emf equation of 3-Phase induction motor, Concept of slip in 3- Phase induction motor, Explanation of Torque-slip characteristics of 3-Phase induction motor. Principle of operation of Synchronous Machine.

### Text Books:

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

### References

1. Electrical Engineering Fundamental, Vincent.D.Toro, Pearson Education, Second Edition.

### List of Experiments:

1. Verification of KCL and KVL Law's.
2. Separation of resistance and inductance of choke coil.
3. Study of Transformer, name plate rating.
4. Determination of Turns ratio and polarity of Single Phase Transformer.
5. Determination of equivalent 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 method.
7. Measurement of power in a three phase circuit by three wattmeter method
8. Measurement of various line & phase quantities for a 3-phase circuit.
9. Study of No load characteristics of D.C shunt Generators.
10. Study of comparative features of Synchronous Machine and Induction Machine.



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**B.Tech. in Electronics and Communication (2021-2025)**

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			THEORY			PRACTICAL		L	T	P	CREDITS
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<b>BTEC102</b>		<b>Fundamentals of Electronics Engineering</b>	60	20	20	30	20	3	0	2	4

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### Course Educational Objectives (CEOs):

The subject aims to provide the student with:

1. An understanding of basic Electronics Engg. abstractions on which analysis and design of electronic circuits and systems are based.
2. To familiarize the working and characteristics of diodes, transistors, MOSFETS and some measuring instruments.

### Course Outcomes (COs):

Students will:

1. Learn how to develop and employ circuit models for elementary electronic components, e.g., resistors, sources, inductors, capacitors, diodes and transistors.
2. Be able to utilize various methods of circuit analysis, including simplified methods such as series-parallel reductions, voltage and current dividers, etc.
3. Be able to understand the primitives of Boolean algebra, used to describe the processing of binary circuits.

### Syllabus

#### UNIT I

**8 Hrs.**

**Introduction:** Evolution and Impact of Electronics in industries and in society, Familiarization with Resistors, Capacitors, Inductors, Transformers and Electro-mechanical components, PN Junction diode: Structure, Principle of operation, various types of Diode, Solar cell.

#### UNIT II

**9 Hrs.**

**Rectifiers and Transistors:** Half wave and full wave rectifiers, capacitive filter, Zener voltage regulator. Bipolar Junction Transistors: Structure, Principle of operation, and its CB, CC, CE configuration.

#### UNIT III

**8 Hrs.**

**Basic Electrical Parameter Measuring Instruments:** Voltmeters & Ammeter, Wattmeter, Energy meter, Basics of CRO (analog & digital).

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#### UNIT IV

**8 Hrs.**

**Number System:** Introduction to binary, octal, decimal & hexadecimal systems, representation of negative numbers, 1's, 2's, 9's, 10's complement and their arithmetic. Introduction, Definitions, Principle of Duality, Basic Theorems, Applications of Boolean Algebra, Boolean Functions, Complement of Boolean Function. Logic Gates (Symbol, Truth Table, Logic Diagram): And, OR, NOT, NAND, NOR, XOR, XNOR. Universal Gates: NAND Gate and NOR Gate implementation.

#### UNIT V

**9 Hrs.**

**Signals:** Introduction, Representation of Discrete-time Signals: Graphical Representation, Functional Representation, Tabular Representation, and Sequence Representation. Elementary Signals: Unit Step Function, Unit Ramp Function, Unit Parabolic Function, Unit Impulse Function, Sinusoidal Signal, Real Exponential Signal, Complex Exponential Signal, Rectangular Pulse Function, Triangular Pulse Function and their energy and power calculation.

#### Text Books:

1. Boylested, R. L. and Nashelsky, L., "Electronic Devices and Circuit Theory", 11<sup>th</sup> edition, Pearson Education, 2013.
2. Bell, D. A., "Electronic Devices and Circuits", 5th edition, Oxford University Press, 2008.
3. M. Morris Mano and Michael D. Ciletti, "Digital Design", 5th edition, Pearson Education, 2013
4. A Anand Kumar, "Signals and Systems", 3rd edition, PHI, 2013.

#### References:

1. Sedra and Smith, "Microelectronic Circuits" ,Fourth Edition, Oxford University Press, 2010.
2. Ashok Ambardar, " Analog and Digital Signal Processing", Second Edition, Brooks/Cole Publishing Company.
3. A. Anand Kumar, "Fundamentals of Digital Circuits", Fourth Edition, PHI.
4. A.K Sawhney, "A Course on Electrical and Electronics Measurement and Measuring Instruments" Dhanpat Rai pub, 2015.

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**List of Experiments.**

1. Understanding the working of Laboratory Instruments (Oscilloscope, Function Generator, Digital Multimeter, DC Power Supply)
2. Interpreting the characteristics of Passive Circuit Elements (R, L, C)
3. Interpreting the Time & Frequency Response of RC and RL Circuits.
4. Analyzing V-I curve for P-N Junction Diodes.
5. Analyzing V-I curve for Zener Diode.
6. Analyzing and demonstrating Zener as a voltage regulator
7. Analyzing Half-Wave and Full-Wave (Center tapped and Bridge) Rectifiers
8. Interpreting the characteristics of Bipolar Junction Transistor (BJT)
9. Verification of Truth Table of various logic gates.
10. Understanding basic Combinatorial Circuits using logic gate Integrated circuits.

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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								
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			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

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**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, Involute, 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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BTME101	BEC	ENGINEERING DRAWING	60	20	20	30	20	2	0	4	4

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**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)**

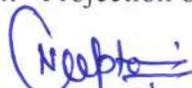
**Isometric Projections:** Introduction of isometric projection, terminology, isometric projections and isometric views, isometric views of planes, right solids, truncated solids and composite solids.

**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:**

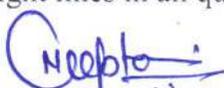
1. Drawing various types of scales using representative fraction.
2. Drawing various conics section.
3. Projection of points in all quadrants.
4. Projection of straight lines in all quadrants in various orientations.



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

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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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# Shri Vaishnav Vidyapeeth Vishwavidyalaya, 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.

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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 ( $\text{FeSO}_4(\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$ ) using  $\text{KMnO}_4$  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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## 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
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BTCH101	BEC	Applied Chemistry	60	20	20	30	20	3	1	2	5	

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### 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)

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

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### 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

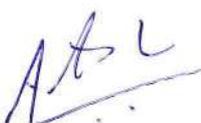
#### BASIC INSTRUMENTAL TECHNIQUES

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

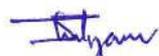
### Unit-IV

#### 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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# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## Shri Vaishnav Institute of Science

Name of Program: B.Tech. (All streams)

(2021-2025)

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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 ( $\text{FeSO}_4(\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$ ) using  $\text{KMnO}_4$  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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# Shri Vaishnav Vidyapeeth Vishwavidyalaya, 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.

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

SUBJECT CODE	Cate gory	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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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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COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			ENDESEM University Exam	Two Term Exam	Teachers Assessment*	ENDESEM 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;

\***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:**

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

**Course Outcomes:**

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

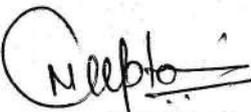
- Understand the basic terminologies used in computer programming.
- Be proficient in using the basic constructs of C/C++, to develop a computer program.
- Understand the use of functions, pointers, arrays and files in programming.
- Understand the fundamentals of object-oriented programming and be able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

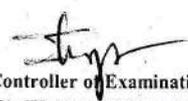
**Syllabus**

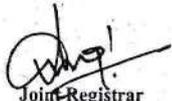
**Unit - I**

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

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

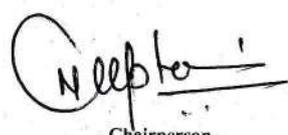
**Design of Program:** Introduction to Algorithms, Complexities and Flowchart, Introduction to Programming, Categories of Programming Languages, Program Design, programming language processing, Algorithm / pseudo code, program development steps, selecting a Language out of many Available Languages for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

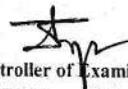
### Unit - III

**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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			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.

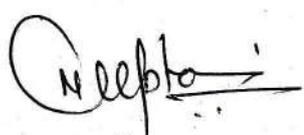
Pointers - Operations on Pointers, Pointers and Multidimensional Arrays, Array of pointers, pointers to pointers, bitwise operators, and dynamic memory managements functions.

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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Course code	Category	Course name	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			ENDESEM University Exam	Two Term Exam	Teachers Assessment*	ENDESEM 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;

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

**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.

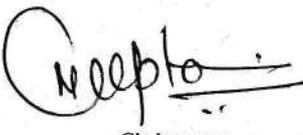
**References:**

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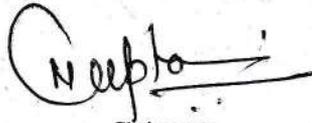
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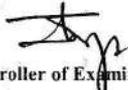
COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			ENDESEM University Exam	Two Term Exam	Teachers Assessment*	ENDESEM University Exam	Teachers Assessment*				
BTCS101	BEC	COMPUTER PROGRAMMING-I	0	0	0	30	20	0	0	2	1

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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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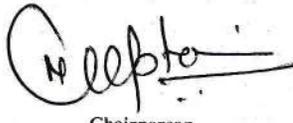
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COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			ENDESEM University Exam	Two Term Exam	Teachers Assessment*	ENDESEM University Exam	Teachers Assessment*				
BTCS101	BEC	COMPUTER PROGRAMMING-I	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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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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**HUMANITIES**

**Semester I / Semester II**

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*				
HUCS101	AECC	Communication Skills	60	20	20	-	20	1	0	2	2

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

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**Course educational Objectives (CEOs): The students will be**

- **CEO1** Provided an overview of Business Communication and an outline to effective Organizational Communication.
- **CEO2** Familiarized with the usage pattern of English language to help them to learn and identify language structures for correct English usage.
- **CEO3** Explained ways to put in use the basic mechanics of Grammar.
- **CEO4** Imparted the nuances of Business correspondence and different types of letter writing required in an official setup.
- **CEO5** Imparted the different types of Reports used in an organizational setup.

**Course Outcomes (Cos): The students will be able to**

- **CO1** Demonstrate strong conceptual knowledge of organizational communication and its different barriers and at the same time develop an understanding of verbal and non verbal communication in a business set up.
- **CO2** Demonstrate his/her ability to write error free sentences and speak in the required Communicative competence.
- **CO3** apply knowledge of spotting common errors and rectify them and develop coherence, cohesion and competence in oral and written discourse.
- **CO4** Draft effective business correspondence (letters) with brevity and clarity depending on the various prescribed formats.
- **CO5** Delineate effective business reports with brevity and clarity depending on the various prescribed Formats.

**COURSE CONTENTS:**

**UNIT I**

Communication: Nature, Meaning, Definition, Verbal and Non Verbal Communication Barriers to Communication.

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**HUMANITIES**

**Semester I / Semester II**

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*				
HUCS101	AECC	Communication Skills	60	20	20	-	20	1	0	2	2

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

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### UNIT II

Basic Language Skills: Grammar and usage- Parts of Speech, Tenses, S-V Agreement, Preposition, Article.

### UNIT III

Basic Language Skills: Types of Sentence, Direct - Indirect, Active - Passive voice, Phrases & Clauses.

### UNIT IV

Business Correspondence: Business Letter, Parts & Layouts of Business Resume and Job application, E-mail writing.

### UNIT V

Report Writing: Importance of Report, Types of Report, Structure of a Report.

### Practical:

- Self Introduction
- Reading Skills and Listening Skills
- Oral Presentation
- Linguistics and Phonetics
- JAM (Just a Minute)
- Group Discussion

### Suggested Readings

- Ashraf Rizvi.(2005). *Effective Technical Communication*. New Delhi:Tata Mc Graw Hill
- Adair, John (2003). *Effective Communication*. London: Pan Macmillan Ltd.

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**Shri Vaishnav Institute of Social Sciences, Humanities and Arts**  
**Choice Based Credit System (CBCS) in Light of NEP-2020**

**HUMANITIES**

**Semester I / Semester II**

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*				
HUCS101	AECC	Communication Skills	60	20	20	-	20	1	0	2	2

**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.

- A.J. Thomson and A.V. Martinet(1991).*A Practical English Grammar*( 4<sup>th</sup> ed). Newyork: Oxford IBH Pub.
- Kratz, Abby Robinson (1995). *Effective Listening Skills*. Toronto: ON: Irwin Professional Publishing.
- Prasad, H. M.(2001) *How to Prepare for Group Discussion and Interview*. New Delhi: Tata McGraw-Hill.
- Pease, Allan. (1998).*Body Language*. Delhi: Sudha Publications.

**Chairperson**

Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Chairperson**

Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Controller of Examination**

Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Joint Registrar**

Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore