



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

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			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 Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## Shri Vaishnav Institute of Science

### Department of Physics

#### Choice Based Credit System (CBCS)


#### B. Tech. (Common for All branches)

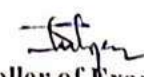
Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment *	End Sem University Exam	Teachers Assessment *				
BTPH101	DC	Applied Physics	60	20	20	30	20	3	1	2	5

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

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

  
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**Department of Physics**  
**Choice Based Credit System (CBCS)**

**BTPH101: Applied Physics**

**UNIT I: Quantum Physics**

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

**UNIT II: Solid State Physics**

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

**UNIT III: Nuclear Physics**


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

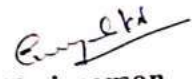
**UNIT VI: Laser & Fiber Optics**


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

**UNIT V: Wave Optics**

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

  
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**BTPH101: Applied Physics**

**REFERENCES**

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

  
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**BTPH101: Applied Physics**

**List of experiments**

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

  
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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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**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, 11<sup>th</sup> Edition, 2013.

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

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

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

**Course Educational Objectives (CEOs):**

The objective of the course is to develop basic knowledge of (A) engineering materials (B) thermodynamics, I.C. engines & boilers (C) principle of statics and friction forces (D) centroid & moments of inertia (E) shear force and bending moment

**Course Outcomes:**

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

1. Student would be able to understand the need of engineering materials and its properties.
2. Student would be able to understand the basic of thermodynamics and its principles.
3. Student would be able to understand working principle of IC engines and boilers.
4. Students will be able to demonstrate various types of forces and their analysis.
5. Students will be able to demonstrate centre of gravity and moment of inertia of different geometrical shaped figures.
6. Students will be able to determine the concepts of stress, shear force and bending moment in beams.

**Syllabus:**

**UNIT I**

**(8 Hrs)**

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

**UNIT II**

**(9 Hrs)**

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

**IC Engines & Boilers:** Working principle of IC Engine, Terminology of IC engine, Carnot, Otto, and Diesel cycles P-V & T-S diagrams and its efficiency, working of two strokes & four

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## Shri Vaishnav Institute of Technology and Science

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

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

(2021-2025)

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

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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.

stroke Petrol & Diesel engines. Classification and working of boilers, mountings and accessories of boilers, Efficiency and performance analysis of boilers

#### UNIT III

(9 Hrs)

**Basic Concepts and Principles of Statics:** Introduction, Laws of Mechanics, Force, Moment and couple, Principle of Transmissibility, Varignon's theorem, Resultant of force systems, Concurrent and non-concurrent coplanar forces. Free body diagram, Types of supports and their reactions, requirements of stable equilibrium, Equations of equilibrium of coplanar systems.

**Frictional forces:** Frictional Force, Laws of Coulomb Friction, Types of Friction, Sliding Friction, Rolling Friction, Belt Friction, Ladder Friction.

#### UNIT IV

(10 Hrs)

**Centroid & Moments of Inertia:** Centroid, Centre of Gravity, Determination of Centroid of Simple Figures, Centroid of composite Sections, Centre of Gravity of structural Sections.

**Moments of Inertia:** Basic concept of Inertia, Principle of Moment of Inertia, Theorems of Moment of Inertia, Moment of Inertia of simple sections and composite section. Radius of Gyration, Polar Moment of Inertia of Standard Sections

#### UNIT V

(9 Hrs)

**Analysis of Framed Structure:** Introduction, Types of frames, Truss, Types of truss, Analysis of frame using Methods of Joints, Methods of Sections, Graphical Method.

**Shear Force and Bending Moment:** Definition of bending moment and shear force, Sign conventions, Shear force and bending moment diagrams for statically determinate beams subjected to points load, uniformly distributed loads, uniformly varying loads, couple and their combinations.

#### Text and Reference Books:

1. "Basic Mechanical Engineering" by Dr. V. M. Domkundwar and S. S. Bhavikatti, Nirali Prakashan, 2018.
2. "Mechanical Engineering" by R.K. Rajput, S. Chand & Co. Delhi, 2019.

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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.

3. "An Introduction to Mechanical Engineering" by Jonathan Wickert and Kemper Lewis, CENGAGE Learning, 2012.
4. "Engineering Mechanics" by Shames and Rao, Pearson Edu(I), 2005.
5. "Engineering Mechanics (Statics & Dynamics)" by R.C. Hibler, Pearson Edu(I), 2015.
6. "A Text book of Applied Mechanics" by R.K. Rajput, Laxmi Pub. 2016.
7. "A Textbook of Engineering Mechanics" by R K Bansal, Laxmi Pub. 2005.

**List of Experiments:**

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

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**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.

**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								
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			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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HUMANITIES

Semester I / Semester II

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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.

  
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**(2021-2025)**

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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;  
**\*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 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:**

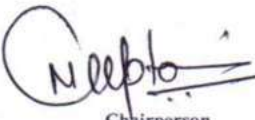
1. Understand the basic terminologies used in computer programming.
2. Be proficient in using the basic constructs of C/C++, to develop a computer program.
3. Understand the use of functions, pointers, arrays and files in programming.
4. Understand the fundamentals of object-oriented programming and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

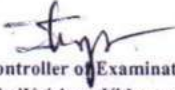
**Syllabus**

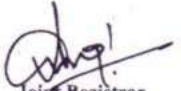
**Unit - I**

**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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			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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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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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.

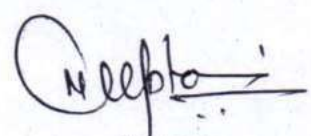
Pointers - Operations on Pointers, Pointers and Multidimensional Arrays, Array of pointers, pointers to pointers, bitwise operators, and dynamic memory managements functions.

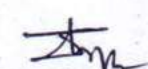
Files - File creation, File processing, Opening and closing a file, text files and binary files, streams, error handling.


#### 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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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.

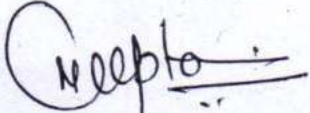
**References:**

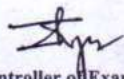
1. Byron S Gottfried, "Programming with C", Schaum's Outlines, Second Edition, Tata McGraw-Hill, 2006
2. Herbert Schildt, "The Complete Reference", 4th Edition, MGH Publication.
3. Dromey R.G., "How to Solve it by Computer", Pearson Education, Fourth Reprint, 2007


**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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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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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	CATEG ORY	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*				
BTME104	SEC	INTRODUCTION TO CAD AND SOLID MODELLING	0	0	0	0	50	0	0	4	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.

**Course Educational Objectives (CEOs):**

To paraphrases with (A) CAD, commands and CAD related applications and its need. (B) 2-D and 3-D modeling terms, draw and editing commands and utility commands.

**Course Outcomes:**

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. Student would be able to understand CAD, its application and limitations.
2. Students would be able to use 2-D drawing, editing commands and its applications.
3. Student would be able to use solid modelling commands and to understand various modelling methods.
4. Students would be able to solve assembly related problems.
5. Students would be able to draw various 2-D, solid models and analyze various machine assemblies.

**Syllabus:**

**UNIT I**

**(6 Hrs)**

**Introduction to CAD:** Introduction, history of 2D and solid modelling, menus, toolbars, pointing device, command prompt, function keys.

**UNIT II**

**(12 Hrs)**

**2-D Drawing& Editing Commands:** Introduction, line commands, coordinate systems, orthogonal lines, circle and arc commands, etc

**Editing Commands:** Introduction, erase and selection commands, move commands, copy commands, extend command, trim command, mirror command, etc

**Layers & Linotypes:** Introduction, layers status, line weights, object properties.

**UNIT III**

**(12 Hrs)**

**Solid modelling Types of Modelling:** Solid modelling, surface modelling and wire frame modelling

**Draw Commands:** Introduction, polygon, cuboids, donut, ellipse, multiline, conic sections, etc

**Editing Commands:** Introduction, extrudes, revolve, sweep, etc

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BTME104	SEC	INTRODUCTION TO CAD AND SOLID MODELLING	0	0	0	0	50	0	0	4	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.

**UNIT IV**

**(10 Hrs)**

**Assembly Drafting:** Introduction, constraints, exploded views, interference check, layout, standard and section views, dimensioning, detailing and plotting.

**UNIT V**

**(10 Hrs)**

**Part Design:** Introduction, 2-d model (triangle, rectangle, circle, etc), solid models (nut, bolts, small machine parts), machine assemblies.

**Text and Reference Books:**

1. "Introduction to AutoCAD 2017" by Palm and Yarwood, Routledge Pub. 2016.
2. "An Introduction to Computer Aided Design (CAD)" by A. Mustun
3. "Mastering AutoCAD 2016 and AutoCAD LT 2016" by G. Omura and Benton, Sybex, 2015.
4. "AutoCAD 3D Training Manual" by K.S. Kurland, 2004.
5. "CAD/CAM: Principles and Application" by P.N. Rao, McGraw Hill, 2010.
6. "Computer Aided Manufacturing" by P.N. Rao, N.K. Tewari and T.K. Kundra, McGraw Hill, 2017.
7. "CAD/CAM: Theory and Practices" by Zeid and Sivasubramanian, McGraw Hill, 2009.
8. "Mastering CAD/CAM" by Zeid, McGraw Hill, 2006.

**List of Experiments:**

1. To study various software for Computer Aided drafting.
2. To study various drawing commands for 2-D drawing in AutoCAD.
3. To study various editing commands from 2-D drawing in AutoCAD.
4. To draw various 2-D drawing using AutoCAD.
5. To study various solid modelling commands in AutoCAD.
6. To draw various solid models using AutoCAD.
7. To study various utility commands in AutoCAD.
8. To study various assemblies and drafting used in machine components.

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