



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTMA101		APPLIED MATHEMATICS - I	3	1	0	4	60	20	20	0	0

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 students with the Fundamentals 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 basics of the differential calculus.
2. Know the fundamental principles of the integral calculus and apply them.
3. Apply the techniques in the numerical analysis.
4. Know the numerical solution of the system of linear algebraic equations.
5. Understand and apply the basics of the vector calculus.

Syllabus:

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 normals. 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

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.

**Chairperson
Board of Studies**

Registrar



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

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 Siedal; 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

Text Books:

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

Reference Books:

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

**Chairperson
Board of Studies**

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTPH 101		APPLIED PHYSICS	3	1	2	5	60	20	20	30	20

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:

The Students (A) To develop the comprehensive understanding of laws of physics. (B) To develop ability to apply laws of physics for various engineering applications. (C) To develop the experimental skills, ability to analyze the data obtained experimentally to reach substantiated conclusions.

Course Outcomes:

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

1. Student will be able to comprehend laws of physics.
2. Student will be able to apply laws of physics for various engineering applications.
3. Student will be able to determine physical parameter experimentally and will be able to analyze the data obtained experimentally to draw substantiate conclusions.

Syllabus:

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 dependent and time independent Schrodinger wave equation.

UNIT II

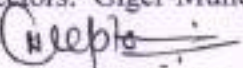
SOLID STATE PHYSICS

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.

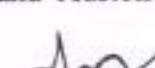
UNIT III

NUCLEAR PHYSICS

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


Chairperson
Board of Studies

Shri Vaishnav Vidyapeeth Vishwavidyalaya


Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

UNIT IV

LASER & FIBRE OPTICS

Stimulated and Spontaneous Emission, Einstein's A&B Coefficients, Population Inversion, Pumping, Techniques of Pumping, Twothree and four level lasers, Optical Resonator, Properties and Applications of Laser, Ruby, Nd:YAG, He-Ne, CO₂ lasers.

Introduction to Optical fibre, Types of Optical fibre, Acceptance angle and cone, Numerical Aperture, V-Number, Fractional refractive index change Δ , Ray theory of propagation through optical fibre, Pulse dispersion and its types, Attenuation, losses and 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 and diffraction grating, Rayleigh criterion, resolving power of grating.

Concept of polarized light, Brewster's laws, Double refraction, Nicol prism, quarter and half wave plate, circularly & elliptically polarized light.

Text Books:

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. M.N. Avdhanulu & P.G. Kshirsagar, "Engg Physics" S.Chand & Co. Edition 2010.
5. Fundamentals of Physics by Halliday, Wiley, India

Reference Books:

1. Concepts of Modern Physics by Beiser, TMH, New Delhi.
2. Solid State Physics by Kittel, Wiley, India.
3. Atomic and Nuclear physics by Brijlal and Subraminiyan.
4. Christopher C. Davis, "LASERS and Electro Optics" Cambridge Univ. Press, 1996.
5. J. Wilson & J.F.B. Hawkes, "Optoelectronics an Introduction" Prentice-Hall II Edition.
6. A.K. Ghatak & Tyagarajan, "LASER theory and applications" 1984.
7. Optics By Ghatak, TMH.

List of Practicals:

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 'E_g' 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 " λ " of LASER light source using Diffraction Grating.
7. Determination of Planck's constant by using photocell.
8. Determination of Energy band gap (E_g) 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.

Chairperson
Board of Studies

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTEE 102		FUNDAMENTALS OF ELECTRICAL ENGINEERING	3	0	2	4	60	20	20	30	20

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:

(A) To impart the basic knowledge about the Electric and Magnetic circuits, (B) To explain the working principle, construction, applications of DC machines, AC machines.

Course Outcomes:

After the successful completion of this course 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

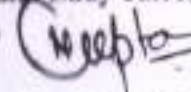
Electrical circuit analysis- Definition of electric circuit, network, linear circuit, non-linear circuit, bilateral circuit, unilateral circuit, Kirchhoff's law, Voltage and current sources, dependent and independent sources, source conversion, DC circuits analysis using mesh & nodal method, Thevenin's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

UNIT II

AC 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

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, Faraday's law, self and mutual inductance. Energy stored in a magnetic field, Hysteretic and Eddy current losses. Electro-mechanical energy conversion.


Chairperson
Board of Studies

Shri Vaishnav Vidyapeeth Vishwavidyalaya


Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

UNIT IV

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

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.

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

List of Practicals:

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.

Chairperson
Board of Studies

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTCE 103	DCS	APPLIED MECHANICS	2	1	2	4	60	20	20	30	20

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:

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

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

Syllabus:

UNIT I

Static & Dynamic Forces: Introduction to Engineering Mechanics, Classification of Engineering Mechanics, Statics, Dynamics, Kinematics, Kinetics etc. Fundamental Laws of Mechanics. Introduction to Dynamics, Basic Concepts and Terms Used in Dynamics, Motion, Types of Motion.

Force, Pressure and Stress, Free Body Diagram, Bow's Notation, Characteristics and Effects of a Force, System of Forces, Resolution of a Force, Composition of Forces, Resultant / Equilibrant Force.

UNIT II

Law of Parallelogram of Forces, Law of Triangle of Forces, Polygon Law of Forces, Lami's Theorem, Equilibrium of a Body Under Two / Three/More Than Three Forces. Law of Superposition of Forces.

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

**Chairperson
Board of Studies**

Registrar



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

UNIT III

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

UNIT IV

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

UNIT V

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

Reference Books:

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

List of Practicals:

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

**Chairperson
Board of Studies**

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTME 102		FUNDAMENTALS OF MECHANICAL ENGINEERING	3	0	2	4	60	20	20	30	20

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

Course Outcomes:

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

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

Note: - Steam table is permit during examination.

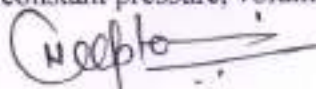
Syllabus:

UNIT I

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

UNIT II

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



**Chairperson
Board of Studies**

Shri Vaishnav Vidyapeeth Vishwavidyalaya



Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

UNIT III

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

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

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

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

UNIT IV

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

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

UNIT V

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

Reference Books:

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

List of Practicals:

1. To perform tensile test, plot the stress-strain diagram and evaluate the tensile properties of a given metallic specimen.
2. To calculate Mechanical Advantage, Velocity ratio and efficiency of various temperature and pressure measuring devices and plot graphs.
3. To study Two-Stroke and Four-Stroke Diesel Engines.
4. To study Two-Stroke and Four-Stroke Petrol Engines.
5. To study Cochran and Babcock and Wilcox boilers.
6. To study Lancashire and Locomotive boilers.
7. To study working and function of mountings and accessories in boilers.
8. To study the Refrigeration System.
9. To study the functioning of Window Room Air Conditioner.
10. To Study Lathe & Drilling Machines and various operation.
11. To perform Arc and Gas Welding operation on metal.

**Chairperson
Board of Studies**

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTCS 101		COMPUTER PROGRAMMING - I	0	0	2	1	0	0	0	30	20

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 subject, 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 : What is a 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-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

Chairperson
Board of Studies

Registrar



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

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.

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.

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.

Reference Books:

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

List of Practicals:

1. Study of procedural programming paradigm and object-oriented programming paradigm.
2. To demonstrate use of data types.
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++
15. Write a program for nested function call.

Chairperson
Board of Studies

Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

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++

**Chairperson
Board of Studies**

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
HUCS 101		COMMUNICATION SKILLS	1	0	2	2	60	20	20	0	20

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. Develop the second language learners' ability to enhance and demonstrate LSRW Skills.
2. Enable students to acquire English Language Skills to further their studies at advanced levels.

Course Outcomes:

1. Enhance confidence in their ability to read, comprehend, organize, and retain written information.
2. Write grammatically correct sentences for various forms of written communication to express oneself.

Syllabus:

UNIT I

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

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.

Chairperson
Board of Studies

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Bachelor of Technology (Railway Engineering)

SEMESTER I (w.e.f. Batch 2018-19)

Suggested Readings

1. Ashraf Rizvi.(2005). *Effective Technical Communication*. New Delhi:Tata Mc Graw Hill
2. Adair, John (2003). *Effective Communication*. London: Pan Macmillan Ltd.
3. A.J. Thomson and A.V. Martinet(1991).*A Practical English Grammar*(4th ed). Newyork: Ox- ford IBH Pub.
4. Kratz, Abby Robinson (1995). *Effective Listening Skills*. Toronto: ON: Irwin Professional Publishing.
5. Prasad, H. M.(2001) *How to Prepare for Group Discussion and Interview*. New Delhi: Tata McGraw-Hill.
6. Pease, Allan. (1998).*Body Language*. Delhi: Sudha Publications

List of Practicals:

1. Self Introduction
2. Reading Skills and Listening Skills
3. Oral Presentation
4. Linguistics and Phonetics
5. JAM (Just a Minute)
6. Group Discussion

Chairperson
Board of Studies

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore