B.Tech in Automotive Electronics Engineering

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
BTMA101	ODS	APPLIED MATHEMATICS-I	60	20	20	0	0	3	1	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs):

To introduce the students with the (A) Fundamentals of the Differential, Integral, Vector Calculus and Numerical Analysis.

Course Outcomes (COs):

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

1. 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, montone 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.

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

B.Tech in Automotive Electronics Engineering

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.

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.

References

1. *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*
6. *R. G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 5th Ed, Wiley, 1999.*
7. *J. Stewart, Calculus: Early Transcendentals, 5th Ed, Thomas Learning (Brooks/ Cole), Indian Reprint, 2003.*
8. *J. Stoer and R. Bulirsch, Introduction to Numerical Analysis, 2nd Edition, Texts in Applied Mathematics, Vol. 12, Springer Verlag, 2002.*
9. *J. D. Hoffman, Numerical Methods for Engineers and Scientists, McGraw-Hill, 2001.*
10. *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.*
11. *S. C. Chapra, Applied Numerical Methods with MATLAB for Engineers and Scientists, McGraw-Hill 2008.*

Chairperson
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Indore

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

B.Tech in Automotive Electronics Engineering

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
BTPH101	ODS	APPLIED PHYSICS	60	20	20	30	20	3	1	2	5

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs):

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

Course Outcomes (COs):

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

The students will be able to

1. 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.

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

B.Tech in Automotive Electronics Engineering

Unit – III

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

Unit – IV

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

Introduction to Optical fiber, Types of Optical fiber, Acceptance angle and cone, Numerical Aperture, V- Number, Fractional refractive index change Δ, Ray theory of propagation through optical fiber, Pulse dispersion and its types, Attenuation, losses and applications of optical fiber.

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.

References

1. *Fundamentals of Physics by Halliday, Wiley, India.*
2. *Concepts of Modern Physics by Beiser, TMH, New Delhi.*
3. *Solid State Physics by Kittel, Wiley, India.*
4. *Atomic and Nuclear physics by Brijlal and Subraminiyan.*
5. *Christopher C. Davis, "LASERSs and Electro Optics" Cambridge Univ. Press, 1996.*
6. *J. Wilson& J.F.B. Hawkes, "Optroelectronics an Introduction" Prentice-Hall II Edition.*
7. *A.K. Ghatak & Tyagarajan, "LASER theory and applications" 1984.*
8. *Optics by Ghatak, TMH.*
9. *Engineering Physics by Dr. S. L. Gupta and Sanjeev Gupta, Dhanpat Rai Publication, New Delhi.*
10. *Engineering Physics by Navneet Gupta, Dhanpat Rai Publication, New Delhi.*
11. *Engineering Physics by H. J. Sawant, Technical Publications, Pune, Maharastra.*
12. *M.N. Avdhanulu & P.G. Kshirsagar, "Engg Physics" S. Chand&Co. Edition 2010.*

List of Experiments

1. Measurement of radius of curvature "R" of convex lens by Newton's ring experiment.
2. Measurement of Numerical aperture of fibre 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.

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Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

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

B.Tech in Automotive Electronics Engineering

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
BTEE102	ODS	FUNDAMENTALS OF ELECTRICAL 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 20 marks.

Course Educational Objectives (CEOs):

(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 (COs):

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

1. Understand and Analyse basic circuit concepts.
2. Apply knowledge of mathematics to analyse 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

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Board of Studies
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Indore

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

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.

References

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. Toro, Pearson Education, Second Edition.*

Listof 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.

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

B.Tech in Automotive Electronics Engineering

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
BTAX101	DS	ENGINEERING 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 20 marks.

Course Educational Objectives (CEOs):

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

Course Outcomes (COs):

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

The students will be able to

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

Syllabus

Unit - I

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

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

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

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

B.Tech in Automotive Electronics Engineering

Unit - II

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

Unit - III

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

Unit - IV

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

Unit - V

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

References

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

List of experiments.

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

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

B.Tech in Automotive Electronics Engineering

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
BTME102	DCS	FUNDAMENTALS OF MECHANICAL 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 20 marks.

Course Educational Objectives (CEOs):

To introduction with (A) Engineering Materials, (B) thermodynamics, heat engines, refrigeration & air conditioning, (C) Production.

Course Outcomes (COs):

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 property, need and defects.
2. Student 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. Student 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, etc.

Syllabus

Unit - I

Introduction to Engineering Materials: Introduction, classification materials, need of engineering materials, important properties of materials. Atomic structure, crystal geometry & structure, crystal imperfection, deformation of materials, phase transformation and mechanical properties.

Unit - II

Introduction to Thermodynamics: Definition of thermodynamics, thermodynamic systems, Macroscopic and Microscopic views, thermodynamic equilibrium, properties of system, point &

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Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

path function, Temperature & pressure terminology and its measurement, laws of thermodynamics.

Unit - III

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

IC Engines: Introduction, terminology of IC engine, cycles used in IC engine, two and four stroke engines, latest technologies used in engines of vehicle.

Boilers: Introduction, steam, types of steam, properties of steam, boilers, types of boilers, terminology related to steam and boilers, boiler mountings & accessories.

Unit - IV

Introduction to Refrigeration & Air Conditioning: Introduction, need of refrigeration, fundamentals of refrigeration, refrigeration systems, refrigerants.

Introduction, need of air conditioning, air conditioning systems, equipment's, components and control.

Unit-V

Introduction to Manufacturing: Material properties, Definition and classification of basic manufacturing process, introduction to casting, Rolling, Extrusion, welding, Brazing, Soldering.

References

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

List of Experiments

1. To perform tensile test, plot the stress-strain diagram and evaluate the tensile properties of a given metallic specimen.
2. To calculate Mechanical Advantage, Velocity Ratio and Efficiency of various temperature and pressure measuring devices and plot graphs.
3. To study Four-Stroke Diesel Engines.
4. To study Four-Stroke Petrol Engines.
5. To study the fire tube boiler, water tube boiler.
6. To study the working and function of mountings and accessories in boilers.
7. To study the Refrigeration System.
8. To study the functioning of Window Room Air Conditioner.

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

B.Tech in Automotive Electronics Engineering

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
HUCS101	ODS	COMMUNICATION SKILLS	60	20	20	0	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 20 marks.

Course Educational Objectives (CEOs):

To develop, enhance and demonstrate (A) LSRW Skills, (B) oral presentation skills(C)To prepare students to become more confident and active participants in all aspects of their undergraduate programs.

Course Outcomes (COs):

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

1. The students will be able to enhance confidence in their ability to read, comprehend, organize, and retain written information.
2. The students will be able to improve upon their language skills, oral communication skills, group discussion, personal development and confidence level.
3. The students will be able to bridge the language gap vital to their success.
4. The students will be able to communicate effectively.

Syllabus

Unit - I

Listening Skills: Listening: Process, Types of Listening: Active, Passive, Pseudo, Evaluative, Difference between listening and hearing. Listening Comprehension exercises.

Unit - II

Speaking Skills: Extempore, Debates, Oral Presentation, Just a Minute.

Unit - III

Linguistics and Phonetics: Consonants and vowel symbols, CV structure, Place and Manner of articulation.

Unit– IV

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Developing Reading Skills: Reading Comprehension, Process, Active & Passive Reading, Reading Speed Strategies, Benefits of effective reading, reading comprehension of Technical material and SQ3R reading technique.

Unit - V

Vocabulary Building: Synonyms, antonyms, idioms and proverbs.

References

1. *Sharma. (). Business Correspondence and Report Writing.; TMH.*
2. *R.K. Bansal and IB Harrison. Spoken English. Orient*
3. *Joan's and Alexander. New International Business English. Longman.; OUP.*
4. *Ashraf Rizvi. (2005). Effective Technical Communication. New Delhi: Tata Mc Graw Hill*

Chairperson
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Indore

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

B.Tech in Automotive Electronics Engineering

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
BTCS101	ODS	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 20 marks.

Course Educational Objectives (CEOs):

To understand the concepts of (A)programming languages (object oriented programming and its implementation). (B)program design, program coding, debugging, testing for development. (C)To describe the concepts of loops, arrays.(D)To understand the concepts of memory, pointers, functions, variables.(E)To understand the concepts of class, constructor, destructor.

Course Outcomes (COs):

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

1. Student will able to explain and implement the object oriented programming concepts.
2. Student will design, develop & test program for development.
3. Student will able to apply loop concept in program and design an array program.
4. Student will able to apply & implement the concept of class, constructor & destructor.

Syllabus

Unit -I

Introduction, History Types of languages Structured Language Object oriented programming OOPS terminology and features, Algorithms Definition, needs and characteristics Flow Charts Rules, Advantages and implementation Concepts of loping and counting.

Unit - II

Program Development Program Identification Analysis Program Design Coding Debugging Testing Documentation Maintenance Characteristics of a Good Program Data Types: Primary data types Tokens Variables and literals Keywords and operators C++ Data Types Operators and Expressions Types of operators Precedence of operators.

Unit - III

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Registrar
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Indore

Decision Making, Branching and Looping Branching if, if- else, if-else-if statement switch Statement Conditional operator got statement Looping while, do- while, for statements Nesting of loops, jumping in loops. Arrays: One dimensional array Two dimensional arrays, Multidimensional arrays

Unit -IV

Pointers, Introduction Dynamic and Static allocation of memory Pointer Variable Pointer and arrays of pointers Dynamic memory allocation operators this pointer, User defined functions, Functions, arguments and return values Recursion of functions Variables in functions Automatic, External, Static and register variables

Unit -V

Structures and Unions, Definition of class and object OOPs properties Member variable and member functions Friend Functions Class member access- private, public and protected Array of class objects Structured union, nested class, Constructors and Destructors, Polymorphism, Inheritance and file handling.

References

1. *Fundamentals of Computers: E Balagurusamy, TMH*
2. *Basic Computer Engineering: Silakari and Shukla, Wiley India*
3. *Fundamentals of Computers: V Rajaraman, PHI*
4. *Information Technology Principles and Application: Ajoy Kumar Ray & Tinku Acharya PHI.*

List of Experiments

1. Introduction to different generations of languages (Structured Language Object oriented programming), OOPS terminology and features.
2. Study of procedural programming paradigm and object-oriented programming paradigm.
3. To demonstrate use of data types, simple operators (expressions).
4. To demonstrate decision making statements (switch case) decision making statements (if and if-else, nested structures).
5. To demonstrate use of simple loops and nested loops.
6. To demonstrate menu driven programs and use of standard library functions.
7. To demonstrate writing C programs in modular way (use of user defined functions
8. To demonstrate recursive functions.
9. To demonstrate use of 1D array and multidimensional array (2-d arrays).
10. To demonstrate use of pointers and concept of strings (strings and pointers).
11. . Write a program to illustrate functions.
12. [Classes and Objects] Write a program that uses a class where the member functions are defined inside a class.
13. [Classes and Objects] Write a program to demonstrate the use of static data members.
14. [Constructors and Destructors] Write a program to demonstrate the use of zero argument and parameterized constructors.

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15. [Constructors and Destructors] Write a program to demonstrate the use of dynamic constructor.
16. [Constructors and Destructors] Write a program to demonstrate the use of explicit constructor.
17. [Operator Overloading] Write a program to demonstrate the overloading of increment and decrement operators.
18. [Operator Overloading] Write a program to demonstrate the overloading of binary arithmetic operators.
19. [Typecasting] Write a program to demonstrate the typecasting of basic type to class type.
20. [Typecasting] Write a program to demonstrate the typecasting of class type to basic type.
21. [Inheritance] Write a program to demonstrate the multilevel inheritance.
22. [Inheritance] Write a program to demonstrate the multiple inheritances.
23. [Inheritance] Write a program to demonstrate the virtual derivation of a class.
24. [Polymorphism] Write a program to demonstrate the runtime polymorphism.
25. [Exception Handling] Write a program to demonstrate the exception handling.
26. [File Handling] Write a program to demonstrate the reading and writing of objects.

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