DEVI AHILYA VISHWAVIDYALAYA, INDORE

FACULTY OF ENGINEERING

SCHEME OF EXAMINATION

I B.Tech Programme (As Per AICTE Guideline and NEP 2020)

(Computer Science and Business Systems)

INSTITUTE OF ENGINEERING & TECHNOLOGY

(www.ietdavv.edu.in)

DEVI AHILYA VISHWAVIDYALAYA, INDORE

INSTITUTE OF ENGINEERING & TECHNOLOGY

SCHEME OF EXAMINATION FOR I B.Tech PROGRAMME

(As per AICTE guideline and NEP 2020)

Semester-II

S. No	Subject code	Subject Name	Type	CI-LI-(TW+SL) (Hours/Semester)	Credits* (Total Hrs/30)
1.	2RBBS1	Linear Algebra	BS	30-10-00-80	4
2.	2RBBS2	Statistical Methods	BS	20-10-00-60	3
3.	2RBES3	Data Structures & Algorithms + Lab	ES	20-10-20-70	4
4.	2RBES4	Principles of Electronics + Lab	ES	20-10-20-70	4
5.	2RBBS5	Fundamentals of Economics	BS	20-10-00-60	3
6.	2RBBS6	Business Communication and Value Science-II	BS	20-10-00-60	3
7.	2RBHS7	Environmental Sciences	HS	10-00-00-20	1
TOTAL CREDITS					**22**

This is as per the new National Credit Framework, which accounts for 30 hrs. of learning as equivalent to 1 credit.* **Legend:

a) BS-Basic Science, ES-Engineering Science, HS-Humanities and Social Science including Management, PC-Programme Core, IK- Indian Knowledge System
b) CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem based learning etc. to deliver theoretical concepts)
c) LI: Laboratory Instruction (Includes experiments/practical performances /problem based experiences in laboratory, workshop, field or other locations using different instructional/Implementation strategies)
d) TW: Term work (includes assignments, seminars, micro projects, industrial visits, any other student activities etc.)
e) SL: Self Learning, MOOCs, spoken tutorials, online educational resources etc. (If provided in curriculum structure.)

<table>
<tr><td colspan="3">Devi Ahilya Vishwavidhyalaya, Indore, India
Institute of Engineering and Technology</td><td colspan="4">I Year B.Tech. (Computer Science and Business Systems) II Sem</td></tr>
<tr><td>Course Code & Name</td><td colspan="6">Instructions Hours per Semester and Credits</td></tr>
<tr><td rowspan="3">2RBBS1:
Linear Algebra</td><td colspan="2">Classroom Instruction (CI)</td><td>Lab Instruction (LI)</td><td>Term Work (TW) and Self Learning (SL)</td><td>Total no. of Hours Per Semester</td><td>Total Credits (Total Hours/30)</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>TW+SL</td><td rowspan="2">120</td><td rowspan="2">4</td></tr>
<tr><td>30</td><td>10</td><td>00</td><td>80</td></tr>
</table>

Course Learning Objectives:

- Understand the concepts of matrices and determinants, gain knowledge of methods of matrix rank to solve system of linear equations.
- Understand the concepts of vector spaces, linear span, basis of a vector space, linear transformations, orthogonal vectors and their applications.

Prerequisites: Nil

COURSE CONTENTS

Unit I

Introduction to Matrices and Determinants; Solution of linear equations; Cramer's rule; Inverse of a Matrix.

CO Mapped: CO1

Unit II

Vectors and linear combinations; Rank of a matrix; Gaussian elimination; LU Decomposition; Solving System of Linear Equations using the tools of Matrices.

CO Mapped: CO2

Unit III

Vector space; Dimension; Basis; Orthogonality; Projections; Gram-Schmidt orthogonalization and QR decomposition.

CO Mapped: CO3

Unit IV

Eigenvalues and Eigenvectors; Positive definite matrices; Linear transformation; Hermitian and unitary matrices.

CO Mapped: CO4

Unit V

Singular value decomposition and Principal component analysis (Non-credit and optional); Introduction to their applications in Image Processing and Machine Learning (one or two classes).

CO Mapped: CO5

Course Outcomes (CO):

CO. No.	CO
CO1	Ability to apply matrix operations and determinants to solve system of linear equations effectively.
CO2	Ability in finding the rank of matrices as well as LU decomposition to solve linear equations.
CO3	Capability in analysing vector spaces, determining linear independence and the basis of a vector space.
CO4	Capability to apply linear transformations, and orthogonalizations techniques to solve problems in vector spaces.
CO5	Ability to understand and apply singular value decomposition and principal component analysis in image processing and machine learning.

Books Recommended:

[1] Linear Algebra and its Applications, (5^{th} Edition, 2023) David C. Lay, Pearson India Education Services.
[2] Advanced Engineering Mathematics, (7^{th} Edition, 2012), Peter V. O'Neil, Cengage Learning.
[3] Advanced Engineering Mathematics, (2^{nd} Edition, 1998), Michael. D. Greenberg, Pearson.
[4] Introduction to Linear Algebra, (5^{th} Edition, 2016), Gilbert Strang, Wellesley-Cambridge Press.
[5] Digital Image Processing, (4^{th} Edition, 2018), R. C. Gomzalez, R E Woods, Pearson.
[6] Machine Learning in Python, (2015) Michael Bowles, John Wiley & Sons, Inc.

CO-PO-PSO Relationship:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
2RBBS1.CO1	3	3	2	2	3							3	2	1
2RBBS1.CO2	3	3	2	2	3							2	3	1
2RBBS1.CO3	3	3	2	2	3							3	2	1
2RBBS1.CO4	3	3	2	2	3							2	3	1
2RBBS1.CO5	3	3	3	3	3							3	2	1

- *CO (Rows) mention Nil / Very Small / Insignificant Contribution to the PO (Column)
- 1: Relevant and Small Significant 2: Medium or Moderate and 3: Strong

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<tr><td>Course Code & Name</td><td colspan="6">Instructions Hours per Semester and Credits</td></tr>
<tr><td rowspan="3">2RBBS2:
Statistical Methods</td><td colspan="2">Classroom Instruction (CI)</td><td>Lab Instruction (LI)</td><td>Term Work (TW) and Self Learning (SL)</td><td>Total no. of Hours Per Semester</td><td>Total Credits (Total Hours/30)</td></tr>
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<tr><td>20</td><td>10</td><td>00</td><td>60</td></tr>
</table>

Learning Objectives:

- Understand various sampling techniques and their applications to finite and infinite populations. Gain knowledge of linear statistical models, correlation and regression analysis.
- Learn about estimation techniques, and criteria for good estimates. Attain ability in hypothesis testing and the formulation of test procedures.
- Understand non-parametric inference methods and basics of identification, estimation and Forecasting.

Prerequisites: Nil

COURSE CONTENTS

Unit-I

Sampling Techniques: Random sampling. Sampling from finite and infinite populations. Estimates and standard error (sampling with replacement and sampling without replacement), Sampling distribution of sample mean, stratified random sampling.

CO Mapped: CO1

Unit-II

Linear Statistical Models: Scatter diagram. Linear regression and correlation. Least squares method. Rank correlation. Standard multiple regression models with emphasis on detection of collinearity, outliers, non-normality and autocorrelation, Validation of model assumptions. Multiple correlation, Analysis of variance (one way, two way with as well as without interaction).

CO Mapped: CO2

Unit-III

Estimation: Point estimation, criteria for good estimates (un-biasedness, consistency), Methods of estimation including maximum likelihood estimation.

Test of hypothesis: Concept & formulation, Type I and Type II errors, Neyman Pearson lemma, Procedures of testing.

CO Mapped: CO3

Unit-IV

Non-parametric Inference: Comparison with parametric inference, Use of order statistics. Sign test, Wilcoxon signed rank test, Mann-Whitney test, Run test, Kolmogorov-Smirnov test. Spearman's and Kendall's test.

CO Mapped: CO4

Unit-V

Basics of Time Series Analysis & Forecasting: Stationary, ARIMA Models: Identification, Estimation and Forecasting.

CO Mapped: CO5

Course Outcome (CO):

CO. No.	CO
CO1	Ability to select a suitable-sampling techniques and analyze samples from finite and infinite populations.
CO2	Ability to interpret and apply linear statistical models, correlation, and regression for data analysis and curve fitting.
CO3	Ability to estimate population parameters and understanding the properties of good estimates. Capability to formulate and conduct hypothesis tests.
CO4	Ability to apply non-parametric inference techniques.
CO5	Ability to perform time series analysis and forecasting using ARIMA models.

Books Recommended:

[1] Probability and Statistics for Engineers, I.R. Miller, J.E. Freund and R. Johnson, 9th Edition, Pearson Education Limited, 2018.
[2] Fundamental of Mathematical Statistics, S.C. Gupta and V.K. Kapoor, 12th edition, Sultan Chand and Sons, 2020.

[3] The Analysis of Time Series: An Introduction, Chris Chatfield, 6th edition, Chapman and Hall/CRC, 2003.
[4] Introduction to Linear Regression Analysis, D.C. Montgomery, E. A. Peck and G. Geoffrey Vining, 3rd edition, Wiley India Pvt Ltd., 2006.
[5] Introduction to the Theory of Statistics, A.M. Mood, F.A. Graybill and D.C. Boes, 3rd edition, McGraw Hill Education, 2017.
[6] Applied Regression Analysis, N. Draper and H. Smith, 3rd edition, Wiley-Interscience, 1998.
[7] Fundamentals of Statistics (Vol. I & Vol. II), A. Goon, M. Gupta and B. Dasgupta, Vol. 2, World Press Pvt. Ltd., Calcutta, 1933.

CO-PO Relationship:

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO 1	PSO 2	PSO 3
2RBBS2.CO1	3	3	3	3	3	2	-	-	-	-	-	3	2	1
2RBBS2.CO2	3	3	2	3	3	2	-	-	-	-	-	2	3	1
2RBBS2.CO3	3	3	3	3	3	2	-	-	-	-	-	3	2	1
2RBBS2.CO4	3	3	2	3	3	-	-	-	-	-	-	2	3	1
2RBBS2.CO5	3	3	3	3	3	-	-	-	-	-	-	3	2	1

Devi Ahilya Vishwavidhyalaya, Indore, India Institute of Engineering and Technology				**I Year B.Tech. (Computer Science and Business Systems) II Sem**		
Course Code & Name	**Instructions Hours per Semester and Credits**					
2RBBS3: Data Structures & Algorithms + Lab	**Classroom Instruction (CI)**		**Lab Instruction (LI)**	**Term Work (TW) and Self Learning (SL)**	**Total no. of Hours Per Semester**	**Total Credits (Total Hours/30)**
	L	**T**	**P**	**TW+SL**	**120**	**4**
	20	**10**	**20**	**70**		

Course Learning Objectives:

- Efficient Data Management**:** Understand how to organize and store data using structures like arrays, linked lists, stacks, queues, trees, and graphs to enable efficient data access and modification.
- Problem-Solving Skills**:** Develop the ability to design and implement algorithms that solve computational problems effectively, utilizing techniques such as sorting, searching, recursion, and dynamic programming.
- Performance Analysis: Learn to evaluate the efficiency of algorithms and data structures in terms of time and space complexity, using Big O notation to make informed decisions in software development.
- Application in Real-World Scenarios: Apply DSA concepts to practical situations, such as optimizing routes in navigation systems, managing data in databases, and enhancing the performance of applications.

Prerequisites: Knowledge of Computer Programming

UNIT 1

Basic Terminologies and Introduction to Algorithm & Data Organisation: Algorithm specification, Recursion, Performance analysis, Asymptotic Notation - The Big-O, Omega and Theta notation, Programming Style, Refinement of Coding - Time-Space Trade Off, Testing, Data Abstraction.

CO Mapped: CO1

UNIT 2

Linear Data Structure: Array, Stack, Queue, Linked-list and its types, Various Representations, Operations & Applications of Linear Data Structures.
CO Mapped: CO2

UNIT 3

Non-linear Data Structure: Trees (Binary Tree, Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVL Tree, Splay Tree) and Graphs (Directed, Undirected), Various Representations, Operations & Applications of Non-Linear Data Structures.
CO Mapped: CO3

UNIT 4

Searching and Sorting on Various Data Structures: Sequential Search, Binary Search, Comparison Trees, Breadth First Search, Depth First Search Insertion Sort, Selection Sort, Shell Sort, Divide and Conquer Sort, Merge Sort, Quick Sort, Heapsort, Introduction to Hashing.
CO Mapped: CO4

UNIT 5

File: Organisation (Sequential, Direct, Indexed Sequential, Hashed) and various types of accessing schemes.

Graph: Basic Terminologies and Representations, Graph search and traversal algorithms and complexity analysis.
CO Mapped: CO5

Course Outcome (CO):

CO. No.	CO
CO1	Understand basic algorithm design, performance analysis, and data organization principles.
CO2	Apply appropriate linear data structures (array, stack, queue, linked list) to solve computational problems.
CO3	Implement and utilize non-linear data structures like trees and graphs for efficient data management and retrieval.
CO4	Analyze and apply various searching and sorting algorithms with respect to their time and space complexities.
CO5	Demonstrate understanding of file organization techniques and apply appropriate data access methods in real-world scenarios. Design and develop efficient algorithms using suitable data structures and demonstrate their correctness through testing and complexity analysis.

List of Practical Assignments:

1. Towers of Hanoi using user defined stacks.
2. Reading, writing, and addition of polynomials.
3. Line editors with line count, word count showing on the screen.
4. Trees with all operations.
5. All graph algorithms.
6. Saving / retrieving non-linear data structure in/from a file.

BooksRecommended:

[1] Fundamentals of Data Structures, E. Horowitz, S. Sahni, S. A-Freed, Universities Press.
[2] Data Structures and Algorithms, A. V. Aho, J. E. Hopperoft, J. D. UIlman, Pearson.
[3] The Art of Computer Programming: Volume 1: Fundamental Algorithms, Donald E. Knuth.
[4] Introduction to Algorithms, Thomas, H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, The MIT press.
[5] Open Data Structures: An Introduction (Open Paths to Enriched Learning), (Thirty First Edition), Pat Morin, UBC press.

CO-PO-PSO Relationship:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
2RBBS3.CO1	3	2	2									3	2	1
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2RBBS3.CO3	3	3	3	2	2							3	3	3
2RBBS3.CO4	3	3	3	3	2							2	3	3
2RBBS3.CO5	3	3	3	3	3							2	2	3

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<tr><td rowspan="3">2RBES4
Principles of Electronics + Lab</td><td colspan="2">Classroom Instruction (CI)</td><td>Lab Instruction (LI)</td><td>Term Work (TW) and Self Learning (SL)</td><td>Total no. of Hours Per Semester</td><td>Total Credits (Total Hours/30)</td></tr>
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</table>

Course Learning Objectives:

- Electronic Components: Identifying and understanding the function of resistors, capacitors, inductors, diodes, transistors (BJTs and MOSFETs), and operational amplifiers (op-amps).
- Circuit Analysis: Applying circuit laws (Kirchhoff's Voltage and Current Laws), network theorems (superposition, Thevenin, Norton), and techniques like voltage and current dividers.
- Performance Analysis: Learn to evaluate the efficiency of algorithms and data structures in terms of time and space complexity, using Big O notation to make informed decisions in software development.
- Signal Processing: Understanding basic signal types (analog and digital), representing signals in time and frequency domains, and basic signal manipulation (filtering, amplification).

Prerequisites: To understand basic electronics, you need strong foundations in high school math (algebra, calculus basics) and physics (electricity, magnetism), focusing on concepts like voltage, current, resistance, Ohm's Law, Kirchhoff's Laws, and basic circuit analysis (series/parallel), plus an introduction to fundamental components like resistors, capacitors, diodes, and transistors. A grasp of binary numbers and logic gates is also key for digital electronics.

COURSE CONTENTS

Unit I

Semiconductors: Crystalline material: Mechanical properties, Energy band theory, Fermi levels; Conductors, Semiconductors & Insulators: electrical properties, band diagrams. Semiconductors: intrinsic & extrinsic, energy band diagram, P&N-type semiconductors, drift & diffusion carriers.

CO Mapped: CO1

Unit II

Diodes and Diode Circuits: Formation of P-N junction, energy band diagram, built-in-potential, forward and reverse biased P-N junction, formation of depletion zone, V-I characteristics, Zener breakdown, Avalanche breakdown and its reverse characteristics; Junction capacitance and Varactor diode. Simple diode circuits, load line, linear piecewise model; Rectifier circuits: half wave, full wave, PIV, DC voltage and current, ripple factor, efficiency, idea of regulation.

CO Mapped: CO2

Unit III

Bipolar Junction Transistors: Formation of PNP / NPN junctions, energy band diagram; transistor mechanism and principle of transistors, CE, CB, CC configuration, transistor characteristics: cut-off active and saturation mode, transistor action, injection efficiency, base transport factor and current amplification factors for CB and CE modes. Biasing and Bias stability: calculation of stability factor

CO Mapped: CO3

Unit IV

Feed Back Amplifier, Oscillators and Operational Amplifiers: Concept (Block diagram), properties, positive and negative feedback, loop gain, open loop gain, feedback factors; topologies of feedback amplifier; effect of feedback on gain, output impedance, input impedance, sensitivities (qualitative), bandwidth stability; effect of positive feedback: instability and oscillation, condition of oscillation, Barkhausen criteria. Introduction to integrated circuits, operational amplified and its terminal properties; Application of operational amplifier; inverting and non-inverting mode of operation, Adders, Subtractors, Constant-gain multiplier, Voltage follower, Comparator, Integrator, Differentiator.

CO Mapped: CO4

Unit V

Digital Electronics Fundamentals: Difference between analog and digital signals, Logic ICs, half and full adder/subtractor, multiplexers, demultiplexers, flip-flops, shift registers, counters.

CO Mapped: CO5

Course Outcomes (CO):

CO. No.	CO
CO1	Understanding the function of resistors, capacitors, inductors, diodes, transistors (BJTs and MOSFETs), and operational amplifiers (op-amps).
CO2	Familiarization with common electronic test equipment (multimeters, function generators, oscilloscopes) and the ability to use them for circuit testing and troubleshooting.
CO3	Using software tools to simulate and analyze electronic circuits before physical construction.

CO4	Developing the ability to diagnose faults in electronic circuits and apply appropriate solutions.
CO5	Designing and building a mini-project using electronic components and devices.

List of Practical:

1. Study the following devices:

(a) Analog & digital multimeters
(b) Function/ Signal generators
(c) Regulated d. c. power supplies (constant voltage and constant current operations)
(d) Study of analog CRO, measurement of time period, amplitude, frequency & phase angle using Lissajous figures.

2. Plot V-I characteristic of P-N junction diode & calculate cut-in voltage, reverse Saturation current and static & dynamic resistances.

3. Plot V-I characteristic of LED & calculate cut-in voltage, reverse Saturation current and static & dynamic resistances.

4. Plot V-I characteristic of zener diode and study of zener diode as voltage regulator.

5. Application of Diode as clipper

6. Application of Diode as clamper

7. Study half wave rectifier and effect of filters on wave. Also calculate theoretical & practical ripple factor.

8. Study full wave rectifier and effect of filters on wave. Also calculate theoretical & practical ripple factor.

9. Verification and interpretation of truth table for AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates.

10. Construction of half and full adder using XOR and NAND gates and verification of its operation.

11. To Study and Verify Half and Full Subtractor.

Books Recommended:

[1] Integrated Electronics Analog And Digital & System Author – Jacob Millman. Christos C. Halkias.
[2] Electronics Circuits And Systems Author: Owen Bishop.
[3] Electronics and Communications for Scientists and Engineers Author: Martin Plonus.
[4] Electronics and Communications for Scientists and Engineers Author: Martin Plonus.
[5] Intuitive Analog Circuit Design Author: Marc T. Thompson 5. Practical Design of Digital Circuits Author: Ian Kampel.

[6] R.A. Gayakwad, OP-amps and linear integrated circuits, Prentice Hall of India.
[7] Digital Logic Applications and Design- John M. Yarbrough, Thomson Publications, 2006.
[8] Digital Logic and State Machine Design – Comer, 3rd, Oxford, 2013.

CO-PO-PSO Relationship:

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2RBES4.CO1	3	2	2	-	-							1	3	2
2RBES4.CO2	3	2-	3	2	-							1	3	2
2RBES4.CO3	3	2	-	-	2							1	3	3
2RBES4.CO4	3	3	3	-	-							1	3	2
2RBES4.CO5	3	2	2	-	2							2	3	3

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<tr><td>Course Code & Name</td><td colspan="6">Instructions Hours per Semester and Credits</td></tr>
<tr><td rowspan="3">2RBBS5:
Fundamentals of Economics</td><td colspan="2">Classroom Instruction (CI)</td><td>Lab Instruction (LI)</td><td>Term Work (TW) and Self Learning (SL)</td><td>Total no. of Hours Per Semester</td><td>Total Credits (Total Hours/30)</td></tr>
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<tr><td>20</td><td>10</td><td>00</td><td>60</td></tr>
</table>

Course Learning Objectives:

- Understand the fundamental concepts and principles of microeconomics and macroeconomics**,** including demand, supply, production, market structures, national income, inflation, and business cycles.
- Apply economic theories to real-world issues such as price control policies, taxation, subsidies, unemployment, and government stabilization measures through monetary and fiscal policies.

Prerequisite(s): Nil

COURSE CONTENTS

Unit-I

Introduction to Economics: Definitions, Nature and Scope of Economics; Difference between Microeconomics and Macroeconomics; Production Possibility Frontier.

Principles of Demand: Demand Curves of Households - Elasticity of Demand; Consumer Behaviour - Axioms of Choice - Budget Constraints and Indifference Curves; Consumer's Equilibrium - Effects of a Price Change, Income and Substitution Effects -Derivation of a Demand Curve

CO Mapped: CO1

Unit-II

Principles of Supply: Supply Curves of Firms; Determinants of Supply, and Fluctuation of supply; Elasticity of Supply and its measurement.

Equilibrium and Comparative Statics: Price Determination**;** Shift of a Curve and Movement along the Curve; Welfare Analysis - Consumers' and Producers' Surplus - Price Ceilings and Price Floors; Applications - Tax and Subsidies - Intertemporal Consumption - Suppliers' Income Effect;

CO Mapped: CO2

Unit-III

Theory of Production: Production Function and Iso-quant, Factors of Production; Law of Variable Proportions; Law of returns to scale. Cost Curves: Total, Average and Marginal Costs - Long Run and Short Run Costs.

Market structure: Revenue and Profit Analysis under different Market Structures; Equilibrium of a Firm under Perfect Competition; Monopoly and Monopolistic Competition

CO Mapped: CO3

Unit-IV

National Income and its Components: GNP, NNP, GDP, NDP; Methods of Computing National Income -Production Method, Income Method, Expenditure Method.Simple Keynesian Model of Income Determination and the Keynesian Multiplier: Government Sector - Taxes and Subsidies; External Sector - Exports and Imports;

Money: Definitions; Demand for Money and Supply of Money.

CO Mapped: CO4

Unit-V

Inflation: Types of Inflation, Causes, Effects, Inflation and Unemployment.

Business Cycles and Stabilization: Meaning, Objectives, Tools of Monetary and Fiscal Policy.

CO Mapped: CO5

Course Outcomes (CO):

CO. No.	CO
CO1	To introduce students to the fundamental concepts, definitions, and scope of economics, distinguishing between microeconomics and macroeconomics. The

	course aims to develop an understanding of the Production Possibility Frontier and core principles of demand. It also focuses on analyzing consumer behavior using tools like demand curves, elasticity, axioms of choice, budget constraints, and indifference curves, leading to the derivation of the demand curve.
CO2	To explain the principles and determinants of supply, supply elasticity, and market equilibrium. The course covers price determination, shifts in demand and supply, welfare analysis through consumer and producer surplus, and the effects of taxes, subsidies, and price controls on market outcomes.
CO3	To study production theory, cost analysis, and firm behavior under various market structures, focusing on production functions, cost curves, and equilibrium in different competitive settings.
CO4	To familiarize students with national income aggregates and their calculation methods, analyze income determination through the Keynesian framework, and understand the functions, demand, and supply of money in an economy.
CO5	To understand inflation, its forms, impacts, and link with unemployment, along with the concept of business cycles. The course also focuses on policy measures through monetary and fiscal tools to maintain economic stability.

BooksRecommended:

[1] Microeconomics, Pindyck, Robert S., and Daniel L. Rubinfeld.

[2] Macroeconomics, Dornbusch, Fischer and Startz.

[3]Economics, Paul Anthony Samuelson, William D. Nordhaus.

[4] Intermediate Microeconomics: A Modern Approach, Hal R, Varian.

[5]Principles of Macroeconomics, N. Gregory Mankiw.

[6]Principles of Microeconomics, H. L. Ahuja.

[7]Managerial Economics, S Damodaran.

CO-PO-PSO Relationship:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
2RBBS6.CO1						2	3	-	2	2	3	1	1	3
2RBBS6.CO2						2	3	-	2	2	3	2	2	3
2RBBS6.CO3						2	3	-	1	2	3	1	1	3
2RBBS6.CO4						2	3	-	2	2	3	2	2	3
2RBBS6.CO5						3	3	-	1	2	3	1	1	3

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Course Code & Name	**Instructions Hours per Semester and Credits**					
2RBBS6: **Business Communication and Value Science-II**	**Classroom Instruction (CI)**		**Lab Instruction (LI)**	**Term Work (TW) and Self Learning (SL)**	**Total no. of Hours Per Semester**	**Total Credits (Total Hours/30)**
	L	**T**	**P**	**TW+SL**	**90**	**3**
	20	**10**	**00**	**60**		

Course Learning Objectives:

- To develop value-based communication skills for analyzing social issues, writing ethical reports, and fostering inclusive leadership.
- To equip learners with practical knowledge of NGO formation, ethical advertising, resume writing, and skit-based storytelling.
- To enhance professional competencies in group communication, interviews, meetings, and public relations for socially responsible engagement.

Prerequisite(s): Basics of Business Communication, types, models and barriers. Basic knowledge of value sciences and business ethics.

COURSE CONTENTS

Unit I:

Identification of Social Issues and Report Writing: Definition and characteristics of social issues, Analysis of key social issues: poverty, unemployment, education inequality, pollution, discrimination, mental health, Report writing: structure, format, and examples, Research on social causes: root cause analysis, global perspectives, proposing solutions, Elements of good vs. bad writing, Grammar, punctuation, and common writing errors, Use of words, tone, register, and the SATORI method of storytelling.

CO Mapped: CO1

Unit II:

Formation and Functioning of an NGO: Meaning, purpose, and scope of NGOs, Steps in forming an NGO: cause identification, research, legal registration, Vision, mission, value statement, tagline, and logo design, Policy creation, governance, and accountability, Fundraising, networking, and partnerships, Introduction to presentation skills: structure, content, delivery, and visuals. Introduction to speed reading: skimming, scanning, SQ3R.

CO Mapped: CO2

Unit III:

Diversity, Ethics, and Resume Writing: Diversity in society and organizations: cultural, gender, racial, cognitive, etc., Ethical concepts: consequentialism and utilitarianism, Ethical leadership in promoting diversity and inclusion, Group Discussion (GD) vs Debate: key skills and structure, Value-based resume writing.

CO Mapped: CO3

Unit IV:

Ethical Advertisement and Value-Based Communication: Why Advertisement Matters (Business & Value Sciences Perspectives), Elements of Ethical & Effective Advertisements, Steps in Ethical Advertisement Making, Skit Design and Dialogue Writing for Ethical Engagement, Collaborative Roles in Ad-Making Teams: Belbin's 8 Team Roles, Personality and Communication: Lindgren's Big S Traits.

CO Mapped: CO4

Unit V:

Group Communication and Professional Practices: Concept, types, and importance of group communication, Interviews: selection, appraisal, grievance, exit, Meetings: notice, agenda, resolution drafting, dynamics, Conferences: planning, execution, modern methods (video, teleconferencing), Public Relations: internal and external strategies.

CO Mapped: CO5

Course Outcomes (CO):

CO. No.	CO
CO1	Identify and report social issues using structured communication infused with ethical and empathetic reasoning.
CO2	Design and present an NGO framework with clarity, purpose, and values like integrity and sustainability.
CO3	Demonstrate inclusive, ethical communication through debates, discussions, and value-based resume writing.
CO4	Apply professional communication skills while upholding, respect, responsibility, and ethical interaction.
CO5	Engage in group communication formats with transparency, collaboration, and a sense of social accountability.

Books Recommended:

[1] Raman, Meenakshi & Sharma, Sangeeta. *Technical Communication: Principles and Practice* (3rd Edition), Oxford University Press, 2015

[2] Ahuja, Ram. ***Social** Problems **in India*** (3rd Edition), Rawat Publications, 2014

[3] Abraham, **Anita.** ***Starting and Managing NGOs*** (2nd Edition), Centre for Civil Society, 2011

[4] Bovee, **Courtland L. & Thill,** John V. ***Business Communication*** *Today* (14th Edition), Pearson Education, 2021

[5] Belch, George E. & Belch, Michael **A.** ***Advertising and Promotion: An Integrated*** *Marketing Communications Perspective* (12th Edition), McGraw-Hill Education, 2023

CO-PO-PSO Relationship:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
2RBBS6.CO1			1		1		1		2		1	1	1	3
2RBBS6.CO2					2	1	2	1	1	2	1	2	2	3
2RBBS6.CO3			1				2	1	2		1	1	1	3
2RBBS6.CO4							1		1		1	2	2	3
2RBBS6.CO5							1	2	2		1	1	1	3

- *CO (Rows) mention Nil / Very Small / Insignificant Contribution to the PO (Column)
- 1: Relevant and Small Significant 2: Medium or Moderate and 3: Strong

<table>
<tr><td colspan="4">Devi Ahilya Vishwavidhyalaya, Indore, India
Institute of Engineering and Technology</td><td colspan="3">I Year B.Tech. (Computer Science and Business Systems) II Sem</td></tr>
<tr><td>Course Code & Name</td><td colspan="6">Instructions Hours per Semester and Credits</td></tr>
<tr><td rowspan="3">2RBHS7:
Environmental Sciences</td><td colspan="2">Classroom Instruction (CI)</td><td>Lab Instruction (LI)</td><td>Term Work (TW) and Self Learning (SL)</td><td>Total no. of Hours Per Semester</td><td>Total Credits (Total Hours/30)</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>TW+SL</td><td rowspan="2">30</td><td rowspan="2">1</td></tr>
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Course Learning Objectives:

- Understand structure and working of Environment and its impact on human life.
- Understand the consequences of human actions on the web of life, global economy, and quality of human life.
- To gain knowledge of natural resources and its impact on economy and human health.
- Understand types, causes, and effects of Pollution and control measures.
- Adopt sustainability as a practice in life, society, and industry.

Prerequisite(s): Basic understanding of general science, environment, natural resources, pollution, and sustainability, along with awareness of human–environment interactions and social responsibility.

COURSE CONTENTS

Unit I:

The Environment and Ecosystem
Structure and components of Environment and their interactions, Structure and functions of Ecosystem, Biodiversity, Food chains and food web, Ecotourism.
CO Mapped: CO1

Unit II:

Natural Resources and their Conservation
Renewable and Non-renewable energy resources, Land, Minerals, Water and Food resources, Problems of Deforestation, impact on economy.
CO Mapped: CO2

Unit III:

Environmental Pollution and Control measures
Environmental pollution, types (Air, Water, Land, Noise), pollutants, sources, harmful effects, Control measures, Pollution case studies.
CO Mapped: CO3

Unit IV:

Global Environmental Issues and Disaster Management
Environment and Human health, Adverse impacts of development of environment, Global Warming, Ozone layer depletion, Eutrophication, water crisis, Climate change, Types and Management of Natural Disasters.
CO Mapped: CO4

Unit V:

Environmental Policies and Sustainable Development
Environmental treaties, Laws and Ethics, Environment Protection Act, Environment Impact Assessment, Environmental education and public awareness, Need and concept of Sustainable development, Smart cities.
CO Mapped: CO5

Course Outcomes (CO):

CO. No.	CO
CO1	Understand and analyse the structure and components of Environment and its impact on Human life
CO2	Relate role of Natural resources and their impact on economy and development
CO3	Understand the impact of environmental hazards on human health and economy
CO4	Learn and practice Environmental Laws and Ethics
CO5	Analyse factors affecting, causes of Environmental Pollution and to apply possible control measures for Sustainable development

Books Recommended:

[1] Environmental Studies: Basic Concepts, V.K. Ahluwalia, The Energy and Resources Institute, New Delhi, 2015.

[2] Environmental Studies, Benny Joseph, Tata McGraw Hill, 2017.

[3] Fundamental Concept in Environmental Studies, D.D. Mishra, S Chand Publications, 2008.

[4] Environmental Chemistry, A.K. De, 6th Edition, New Age International, New Delhi, 2006.

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CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
2RBHS7.CO1	3	1		1								1	3	3
2RBHS7.CO2	2	1	1			2	1					2	2	3
2RBHS7.CO3	3				1	1	2					1	3	3
2RBHS7.CO4	1				1		2	2	1	1	1	2	1	3

2RBHS7.CO5	2	1	1		1	2	2					1	2	3

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