DEVI AHILYA VISHWAVIDYALAYA, INDORE

FACULTY OF ENGINEERING

SCHEME OF EXAMINATION

II B.Tech. Programme in Computer Science and Business Systems
(As Per AICTE Guideline and NEP 2020)

INSTITUTE OF ENGINEERING & TECHNOLOGY
(www.iet.dauniv.ac.in)

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INSTITUTE OF ENGINEERING & TECHNOLOGY

SCHEMES OF EXAMINATION FOR II B. Tech. PROGRAMME

B.Tech. CSBS 4 YEAR UG DEGREE PROGRAMME (As per AICTE guideline and NEP 2020)
L -Lecture, T – Tutorial, P – Practical,
BS-Basic Science, ES-Engineering Science, HS-Humanities and Social Science including Management, PC-Professional Core

Semester-III

S.No	Subject code	Subject Name	Type	L-T-P	Credits
1.	3RBPC1	Formal language and Automata Theory	ES	3-0-0	3
2.	3RBPC2	Computer Organization and Architecture	ES	3-0-1	3+1(P)
3.	3RBPC3	Object Oriented Programming	PC	3-0-1	3+1(P)
4.	3RBPC4	Database Management Systems	PC	3-0-1	3+1(P)
5.	3RBBS1	Computational Statistics	BS	3-0-1	3+1(P)
6.	3RBIK1	Indian Constitution	HS	1-0-0	1
7.	3RBIN1	Internship I	PC	0-0-2	2
TOTAL CREDITS					**22**

Devi Ahilya University, Indore, India Institute of Engineering & Technology				II Year B.Tech. (Computer Science & Business Systems) (Full Time) Sem III			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
	L	**T**	**P**	**L**	**T**	**P**	**Total**
3RBPC1: Formal Language and Automata Theory	**3**	**0**	**0**	**3**	**0**	**0**	**3**
Duration of Theory Paper: 3 Hours							

Learning Objectives:

- To understand the fundamental, of automata Theory, formal language and computation models.
- To design and analyze finite automata, Regular expression and Grammar.
- To Construct and Context fee Grammars and Push down Automata.
- Understand the working and application of Turning Machine.
- Analyze decidability and undecided ability problem.
- Explore the basic of computational complexity (P, NP, NP-Complete, NP- hard).

Prerequisites: Discrete mathematics, data structure and programming language**.**

COURSE CONTENTS

Unit I

Introduction: Alphabet, language and grammar, production, chomsky hierarchy of language.

CO Mapped: CO1

Unit II

Regular language and finite automata -Regular expression and language Deterministic finite automata and equivalence with regular expression,Non-deteministic finite automata with DFA, regular grammar and equivalence with finite automata properties of regular language,kleens theorem pumping lemma for regular language,Myhill Nerode theorem and it's use, minimization of finite automata.

CO Mapped: CO2

Unit III

Context fee language and Push down Automata -Context free grammar (CFG) and language (CFL), chomsky and Greibachnormal forms, Non-deterministic.

Push down Automata (PDA) and equivalence with, CFG, parse trees ambiguity in CFG pumping lemma for context Free language, deterministic pushdown automata, closure properties of CFLs.

CO Mapped: CO3

Unit IV

Context sensitive language -(CSG) and language, linear bounded automata and equivalence with CSG.

CO Mapped: CO4

Unit V

Turning Machine -The basic model for turning machine Turing recognition (recursively enumerable) and Turing -decidable (recursive) language and their closure properties, variant of Turning Machine, Non-deterministic Turing machine and equivalence with deterministic TMs un-restricted grammar and equivalence with Turing machine TM, enumerator. Complexity of deterministic and non-deterministic Turing machine P and NP, NP complete cook's theorem, the NP-Complete problem.

CO Mapped: COP5

Course Outcomes (CO):

CO. No.	CO	PO
CO1	Formal language, grammar and Automata theory to describe computational problem.	PO-1
CO2	Design and analyze finite automata Regular expression and Context fee Grammar language.	PO-1, PO-2, PO-3
CO3	Construct and evaluate push down Automata and Turing machine solving computational problem.	PO-1, PO-2, PO-3, PO-5
CO4	Distinguish between decidable and undecided le problem pumping lemma.	PO-1, PO-2, PO-3, PO-4, PO-5
CO5	Demonstrate understanding of computational complexity by P, NP, NP complete and NP hard problem.	PO-1, PO-2, PO-4, PO-3, PO-5

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	PO-12
CO1	3	2	1	1	1	-	-	-	-	-	-	-
CO2	3	3	2	2	1	-	-	-	-	-	-	-
CO3	3	3	2	2	2	-	-	-	-	-	-	-
CO4	3	3	2	2	2	1	-	-	-	-	-	-
CO5	3	3	2	2	2	3	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

Books Recommendation:

- Book 1: formal language to Automata theory Peter 5th edition
- Book 2: Automata and computability John e.hopcrofft Rajeev Motwani Jeffery D.ullman.

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Subject Code & Name	**Instructions Hours per Week**			**Credits**			
	L	**T**	**P**	**L**	**T**	**P**	**Total**
3RBPC2: Computer Organization & Architecture	**3**	**0**	**1**	**3**	**0**	**1**	**4**
Duration of Theory Paper: 3 Hours							

Learning Objectives:

- Provide a framework for understanding the fundamentals of computing.
- To familiarize students with relationship between hardware and software to focus on the concepts that are the basis for current computers.
- Develop skills to understand how to design a computer.
- To be clear with memory management technique.
- Develop ability to understand how to enhance performance of a computer system.

Prerequisites: Knowledge of Digital Electronics and Computer Programming.

COURSE CONTENTS

Unit-I

Introduction: Difference Between Computer Organization and Computer Architecture, Computer Types, Flynn's Classification, Functional Units, Basic Operational Concepts: Bus Structures, Software; Performance: Processor Clock, Basic Performance Equation, Clock Rate, Compiler, Performance Measurement; Multiprocessors and Multi-computers, Historical Perspective: Generation of computer, Evolution of Performance; Arithmetic for Computers: Addition and Subtraction of Signed Numbers, Multiplication of Positive Numbers, Booth Algorithm, Floating Point Arithmetic: Addition and Multiplication.

CO Mapped: CO1

Unit-II

Memory System: Basic Concepts, Semiconductor RAM Memories, Read-Only Memories: ROM, PROM, EPROM, EEPROM, Flash Memory; Memory Speed, Size and Cost Considerations; Cache Memories: Mapping Functions, Replacement Algorithms, Performance Considerations, Hit Rate and Miss Penalty, Caches on the Processor Chip; Virtual Memories: Address Translation; Memory Management Requirements.

CO Mapped: CO2

Unit III

Processing Unit: Addressing Modes, Connections between the Processor and the Memory, Processor Activity, Instruction cycle, John Von Neumann Architecture, State Machine Concept, Processor as a State Machine, Data Path Architecture, Data Path Controller: Microprogrammed; Hardwired Design, Firmware Design, Microcontroller Design, Design of Flip-Flop to understand the Design of CPU.

CO Mapped: CO3

Unit IV

Input Output Organization: I/O Devices: Introduction, Typical Collection, Diversity; Dependability, Reliability, Availability, Disk Storage, Flash Storage, Connecting Processor Memory and I/O Devices, Connection Basics, Interfacing I/O Devices to the Processor Memory and Operating System: Giving Commands to I/O Devices, Communicating with the Processor, Interrupt Priority Levels, Transferring the Data between a Device and Memory, Direct Memory Access and the Memory System; I/O Performance Measures, Impact of I/O on System Performance.

CO Mapped: CO3 & CO4

Unit-V

Pipelining & Multiprocessors: Principles of Pipelining, Principles of Linear Pipelining, Clock Period, Speedup, Efficiency, Throughput, Classification of Pipeline Processor, General Pipelines and Reservation Tables, Collision Vector, State Diagram for a Pipeline, Pipeline Hazards, Shared Memory Multiprocessors, Clusters and Other Message-Passing Multiprocessors, Introduction to Graphics Processing Units, Introduction to Multiprocessor Network Topologies.

CO Mapped: CO4 & CO5

Course Outcomes (CO):

Upon completing the course, students will be able to:

CO. No.	CO	PO
CO1	Study of the basic structure and operation of a digital computer system.	PO-1, PO-2, PO-12
CO2	Understand the architecture and functionality of central processing unit.	PO-1, PO-2, PO-3
CO3	Exemplify in a better way the I/O and memory organization.	PO-1, PO-2, PO-3, PO-5
CO4	Apply acquired knowledge to improve performance of a computer.	PO-1, PO-2, PO-3 PO-12
CO5	In addition to development in technology, student will be able to innovate in the architecture of computers, such as the use of caches and pipelining	PO-1, PO-2, PO-4, PO-3, PO-5, PO-12

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	PO-12
CO1	3	2	-	-	-	-	-	-	-	-	-	1
CO2	3	3	2	-	-	-	-	-	-	-	-	-
CO3	3	2	2	-	2	-	-	-	-	-	-	-
CO4	3	3	3	-	-	-	-	-	-	-	-	2
CO5	3	3	3	1	3	-	-	-	-	-	-	2

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

Books Recommended:

- Computer System Architecture- M. Morris Mano- Pearson Education.
- Computer Organization, 5th Ed., C. Hamacher, Z. Vranesic, S. Zaky, McGraw Hill International Edition 2002.
- Computer Organization and Design, 5th Ed., David A. Patterson, John L. Hennessy, The hardware/software interface, Morgan Kaufmann Publisher, 2014.
- Patterson & Hennessy, Computer Organization and Design, Morgan Kaufmann Publisher, 2007.
- Computer Architecture and Parallel Processing, Kai Hwang, Faye A. Briggs, McGraw Hill Education, 2012.

List of Practicals:

- Circuits on breadboard or simulators.
- Implementation of Combinational Digital/Boolean Circuits: Adder, Subtractor, Multiplication Module, Division Module, Multiplexer, Demultiplexer, Encoder, Decoder.
- Implementation of Sequential Circuits: Counters, Linear Feedback Shift Registers (LFSR)
- C/C++ programming to understand the formats of char, int, float, double, long etc.
- Machine language programming on x86 or higher version kits or simulators:
    - Add/subtract/multiplication/division/GCD/LCM
    - Accessing some specific memory locations/ports
    - Counting odd and even integers from a series of memory locations
    - Printing values of selected registers
    - Handing interrupts

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Subject Code & Name	**Instructions Hours per Week**			**Credits**			
	L	**T**	**P**	**L**	**T**	**P**	**Total**
3RBPC3: Object Oriented Programming	**3**	**0**	**1**	**3**	**0**	**1**	**4**
Duration of Theory Paper: 3 Hours							

Learning Objectives:

- To introduce students to ideas and techniques from programming concept are widely used in Computer Science.
- To understand the concepts of Object Oriented Programming.
- To analyze the public, protected, and private modes of inheriting classes.
- To demonstrate the overloading of functions and operators to grant them a different meaning.

Prerequisites: Nil

COURSE CONTENTS

Unit-I

Overview of C: Procedural and non procedural programming, Operator and expressions, Scope and Lifetime, Constants, Pointers, Arrays and references, Control Flow, Functions and program structure, Namespaces, Error Handling, Input and output (C-way), Library Functions (string, math, stdlib), command line arguments, Pre processor directive.

Unit-II

Programming in C++: Libraries, Header files, Basic data types, Functions, Conditional statement and loops, structure and pointers, Control statements, Function Parameter passing ,virtual functions, Function overloading and overriding, Exception Handling .

Unit-III

The Fundamental of Object Oriented Programming: Necessary for OOP, Data Hiding, Data Abstraction, Encapsulation, Procedural Abstraction, Class and Object.

More Extensions to C in C++ to provide OOP facilities: Scope of class and Scope Resolution operator, Member Function of a class, private, protected and public Access specifier, this keyword, Constructor and Deconstructor, friend class, error handling(exception) .

Unit-IV

Essentials of Object Oriented Programming: Operator overloading, Inheritance-Single, Multiple, Class Hierarchy, Pointers to object, Assignment of an object to another object,

Polymorphism, through dynamic binding, virtual Functions, overloading, overriding and hiding, Error Handling.

Unit-V

Generic Programming: Template concept, class template, function template, template specialization.
Input and output: Streams, Files, library functions, formatted output.

Course Outcome (CO):

CO. No.	CO	PO
CO1	Understand the fundamental concepts of C programming including procedural and object oriented approaches, operators, expressions and control flow.	PO-1, PO-2, PO-3, PO-4, PO-5
CO2	Understand the concepts of C++ including the structure of program control statements, function parameter passing, Function overloading ,overriding and exception handling	PO-1, PO-2, PO-3, PO-4, PO-5
CO3	Apply object oriented programing principles such as data abstraction, encapsulation, inheritance, polymorphism, and dynamic binding to solve real- world problems.	PO-1, PO-2, PO-3, PO-4, PO-5
CO4	Demonstrate the use of constructors, deconstructors, scope resolution, access specifiers and error handling in designing efficient C++ programs.	PO-1, PO-2, PO-3, PO-4, PO-5
CO5	Implement generic programing using templates (class, function, specialization) and manage input/output operations with streams, files and formatted outputs.	PO-1, PO-2, PO-3, PO-4, PO-5

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	PO-12
CO1	3	3	2	2	3	-	-	-	-	-	-	-
CO2	3	3	2	2	3	-	-	-	-	-	-	-
CO3	3	3	2	2	3	-	-	-	-	-	-	-
CO4	3	3	2	2	3	-	-	-	-	-	-	-
CO5	3	3	2	2	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

Learning Outcomes:

Upon completing the course, students will be able to:

- Learn a basic structure of computer programming
- To understand the concept of OOP's.

Books Recommended:

- The C++ Programming language, Bjarne styroustrup, Addision Wesely.
- C++ and object oriented programming Paradigm Debasish Jana, PHI Learning PVT.LTD.

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Subject Code & Name	**Instructions Hours per Week**			**Credits**			
	L	**T**	**P**	**L**	**T**	**P**	**Total**
3RBPC4: Data Base Management Systems	**3**	**0**	**1**	**3**	**0**	**1**	**4**
Duration of Theory Paper: 3 Hours							

Learning Objectives:

- To understand the dissimilar issues concerned in the intend and implementation of a database system.
- To learn the physical and logical database design, database modeling, relational, hierarchical, and network models.
- To understand and develop data manipulation language to query, modernize, and manage a database
- To intend and build a straightforward database system and show competence with the fundamental
- tasks involved with modelling, designing, and implementing a DBMS

Prerequisites: Basic computer literacy, understanding of data structures, and familiarity with a programming language like C, C++, Java, or Python.

COURSE CONTENTS

Unit I

Introduction: Introduction to Database. Hierarchical, Network and Relational Models. Database system architecture: Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML).

CO Mapped: CO1

Unit II

Data models: Entity-relationship model, network model, relational and object-oriented data models, integrity constraints, data manipulation operations. Relational query languages: Relational algebra, Tuple and domain relational calculus, SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQL server.

CO Mapped: CO2

Unit III

Relational database design: Domain and data dependency, Armstrong's axioms, Functional Dependencies, Normal forms, Dependency preservation, Lossless design. Query processing and optimization: Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms.

CO Mapped: CO3

Unit IV

Storage strategies: Indices, B-trees, Hashing. Transaction processing: Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp based schedulers, Multi-version and optimistic Concurrency Control schemes, Database recovery.

CO Mapped: CO4

Unit V

Database Security: Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection. Advanced topics: Object oriented and object relational databases, Logical databases, Web databases, Distributed databases, Data warehousing and data mining.

CO Mapped:CO5

Course Outcomes (CO):

CO. No.	CO	PO
CO1	Explain fundamental concepts of databases, data models, and DBMS architecture.	PO1, PO2
CO2	Apply ER modeling, relational algebra/calculus, SQL, and use DBMS tools.	PO1, PO2, PO3, PO4, PO5
CO3	Normalize relational schemas using functional dependencies and Armstrong's axioms; analyze query optimization.	PO1, PO2, PO3, PO4
CO4	Evaluate query processing strategies, indexing, hashing, and transaction management with concurrency and recovery	PO1, PO2, PO4, PO5
CO5	Demonstrate database security mechanisms and explore advanced DB concepts.	PO1, PO2, PO3, PO4, PO5

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	PO-12
CO1	3	2	1	1	1	-	-	-	-	-	-	-
CO2	3	3	2	2	2	-	-	-	-	-	-	-
CO3	3	3	2	2	1	-	-	-	-	-	-	-
CO4	3	2	2	3	2	-	-	-	-	-	-	-
CO5	2	2	2	2	2	-	-	-	-	-	-	-

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

Books Recommendation:

- **Database System Concepts** – Abraham Silberschatz, Henry F. Korth, S. Sudarshan *(*McGraw-Hill, 7th Edition*)*
- **Fundamentals of Database Systems** – Ramez Elmasri, Shamkant B. Navathe *(*Pearson, 7th Edition*)*
- **Database Management Systems** – Raghu Ramakrishnan, Johannes Gehrke *(*McGraw-Hill, 3rd Edition)

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Subject Code & Name	**Instructions Hours per Week**			**Credits**			
	L	**T**	**P**	**L**	**T**	**P**	**Total**
3RBBS1: Computational Statistics	**3**	**0**	**1**	**3**	**0**	**1**	**4**
Duration of Theory Paper:3 Hours							

Learning Objectives:

- To Understand Multivariate Data its distribution and Statistics analysis on it. To learn regression analysis, discriminant analysis, principal component analysis, factor analysis, Cluster Analysis, and understand its mathematical model, and perform computation using programming language.
- Developing the concepts of calculus is useful for creating mathematical models that lead to optimal solutions in various disciplines, including physics, engineering, economics, and statistics.

Prerequisites: Nil

COURSE CONTENTS

Unit-I

Multivariate Normal Distribution: Multivariate Normal Distribution Functions, Conditional Distribution and its relation to regression model, Estimation of parameters.

Unit-II

Discriminant Analysis: Statistical background, linear discriminant function analysis, Estimating linear discriminant functions and their properties. Principal Component Analysis: Principal components, Algorithm for conducting principal component analysis, deciding on how many principal components to retain, H-plot.

Unit-III

Factor Analysis: Factor analysis model, extracting common factors, determining number of factors, Transformation of factor analysis solutions, Factor scores. Clustering: Introduction,

Types of clustering, Correlations and distances, clustering by partitioning methods, hierarchical clustering, overlapping clustering, K-Means Clustering Profiling and Interpreting Clusters.

Unit-IV

Python Concepts, Data Structures, Classes: Interpreter, Program Execution, Statements, Expressions, Flow Controls, Functions, Numeric Types, Sequences and Class Definition, Constructors, Text & Binary Files - Reading and Writing

Data Wrangling: Combining and Merging Datasets, Reshaping and Pivoting, Data Transformation, String Manipulation, Regular Expressions.

Unit-V

Data Aggregation, Group Operations, Time series: GoupBy Mechanics, Data Aggregation, Groupwise Operations and Transformations, Pivot Tables and Cross Tabulations, Time Series Basics, Data Ranges, Frequencies and Shifting. **Visualization in Python:** Matplotlib package, Plotting Graphs, Controlling Graph, Adding Text, More Graph Types, Getting and setting values, Patches.

Course Outcome (CO):

Students earned credits will develop ability to

CO.No.	CO	PO
CO1	Understand the difference between univariate and multivariate data and its normal distribution. Apply regression model for prediction of variable value for both univariate and multivariate data.	PO-1, PO-2, PO-3, PO-4, PO-5, PO-6
CO2	Discriminant data set into two or more class and reduce dimensions of data set by applying concept of PCA.	PO-1, PO-2, PO-3, PO-4, PO-5, PO-6
CO3	To understand the concept of factor analysis, understand its mathematical model and perform computation using programming language. and apply Cluster Analysis on multivariate data.	PO-1, PO-2, PO-3, PO-4, PO-5, PO-6
CO4	Apply the split-apply-combine paradigm to analyze complex datasets by leveraging group by operations for segmentation, performing data aggregation and group-wise transformations to summarize data, and constructing pivot tables/cross-tabulations to enable powerful multi-dimensional analysis and reporting for data-driven decision-making.	PO-1, PO-2, PO-3, PO-4, PO-5
CO5	Synthesize time series analysis and advanced visualization techniques by manipulating temporal data (including handling frequencies and shifts) to uncover trends, and then designing, creating, and customizing a variety of clear, annotated, and publication-quality graphs to effectively communicate insights.	PO-1, PO-2, PO-3, PO-4, PO-5

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	PO-12
CO1	3	3	3	2	3	3	-	-	-	-	-	-
CO2	3	3	3	2	3	3	-	-	-	-	-	-
CO3	3	3	3	2	3	3	-	-	-	-	-	-
CO4	3	2	3	2	3	3						
CO5	3	3	3	3	3	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

Books Recommended:

- An Introduction to Multivariate Statistical Analysis, T.W. Anderson.
- Applied Multivariate Data Analysis, Vol I & II, J.D. Jobson.
- Statistical Tests for Multivariate Analysis, H. Kris.
- Programming Python, Mark Lutz.
- Python 3 for Absolute Beginners, Tim Hall and J-P Stacey.
- Beginning Python: From Novice to Professional, Magnus Lie Hetland. Edition, 2005

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Subject Code & Name	**Instructions Hours per Week**			**Credits**			
	L	**T**	**P**	**L**	**T**	**P**	**Total**
3RBIK1 **Indian Constitution**	**1**	**0**	**0**	**1**	**0**	**1**	**1**
Duration of Theory Paper: 3 Hours							

Learning Objectives:

- To impart a comprehensive understanding of the Indian Constitution and to acquaint students with the cardinal features of the Constitution.
- To elucidate the structure, composition, and functioning of the principal organs of the state.
- To critically examine the regime of Fundamental Rights, Directive Principles of State Policy, and Fundamental Duties.

Prerequisite(s): Basic knowledge of the system of governance and polity in India

Course Outcomes:

On successful completion of course we will have

- Understand the origin and features of the Indian Constitution.
- Explain Fundamental Rights, Duties, and Directive Principles.
- Describe the roles of the Legislature, Executive, and Judiciary.
- Analyze key constitutional provisions and landmark cases.
- Apply constitutional principles to current legal and social issues.
- Develop basic legal reasoning and understanding of constitutional values.

Students earned credits will develop ability to

CO. No.	CO	PO
CO1	**Understand the Historical Context:** To provide students with an understanding of the historical background leading to the framing of the Indian Constitution, including the freedom struggle and key constitutional developments during British rule.	PO-7, PO-8
CO2	**Familiarize with the Constitutional Framework:**	PO-3, PO-6

	To introduce the structure, features, and philosophy of the Indian Constitution, including concepts such as sovereignty, secularism, democracy, and federalism.	
CO3	**Explore Fundamental Rights and Duties:** To examine the nature, scope, and importance of Fundamental Rights, Directive Principles of State Policy, and Fundamental Duties enshrined in the Constitution.	PO-3, PO-6
CO4	**Understand the Structure of Government:** To explain the composition, powers, and functions of the Legislature, Executive, and Judiciary at the Union and State levels.	PO-9, PO-10
CO5	**Develop Knowledge of Key Constitutional Provisions:** To analyze major constitutional provisions such as emergency powers, amendment procedures, and distribution of powers between the Centre and States.	PO-8, PO-9 PO-10
CO6	**Promote Civic Awareness and Responsibility:** To foster a sense of constitutional morality, civic responsibility, and awareness of the rule of law and democratic governance	PO-12
CO7	**Encourage Critical Thinking:** To develop the ability to critically analyze constitutional issues, judicial decisions, and contemporary debates on constitutional amendments and reforms.	PO-3
CO8	**Link Constitution with Current Affairs:** To relate the study of the Constitution to contemporary political, social, and legal issues in India.	PO-9, PO-12

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	PO-12
CO1	-	-	2	-	-	2	2	2	3	2	-	2
CO2	-	-	2	-	-	2	1	2	3	2	-	1
CO3	-	-	2	-	-	1	1	2	2	1	-	1
CO4	-	-	1	-	-	1	-	-	2	1	-	-
CO5	-	-	1	-	-	1	-	-	1	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

COURSE CONTENTS

Unit I:

The Preamble of the Constitution; Essential Features of the Constitution; The Union and its Territory; Citizenship; Theory of Basic Structure; Judicial Activism; Public Interest Litigation (PIL)

CO Mapped: CO1 & CO2

Unit II:

Rule of Law; Separation of Power; Fundamental Rights: Right to Equality; Right to Freedom; Protection of Life and Personal Liberty; Right to Education

CO Mapped: CO3, CO6, CO7 and CO8

Unit III:

Right against Exploitation; Right to Freedom of Religion; Right to Constitutional Remedies; Right to Property; Other Fundamental Rights

CO Mapped: CO3, CO6, CO7 and CO8

Unit IV:

Directive Principles of State Policy; Fundamental Duties; The Union and the States; Relations between the Union and the States

CO Mapped: CO4, CO5, CO7 and CO8

Unit V:

The Legislature, the Executive and the Judiciary; Elections; Emergency; Amendment of the Constitution

CO Mapped: CO5, CO6, CO7 and CO8

Books Recommended:

- 'Indian Polity' by Laxmikanth 5th Edition, McGraw Hill.
- 'Introduction to Indian Constitution' by D.D. Basu, 21st Edition, LexisNexis Publisher.
- Indian Constitution by Subhash C. Kashyap, 5th Edition, Vision Books Publisher.
- The Constitution of India: A Contextual Analysis- Arun K. Thiruvengadam, 1st Edition, Bloomsbury Academic also referenced as Bloomsbury Publishing).
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Devi Ahilya University, Indore, India Institute of Engineering & Technology				II Year B.Tech. (Computer Science & Business Systems) (Full Time) Sem III			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
	L	**T**	**P**	**L**	**T**	**P**	**Total**
3RBIN1: Internship I	**0**	**0**	**2**	**0**	**0**	**2**	**2**

Learning Objectives:

- **Apply theory to practice:** Use knowledge and concepts learned in classes to real-world work settings.
- **Deep understanding:** Develop a more thorough understanding of academic principles by engaging with them in a practical environment.
- **Explore connections:** Examine the relationship between classroom theory and actual workplace practices.
- **Workplace Familiarization:** Experience a professional work environment, understand operational procedures, and get acquainted with the actual dynamics of a workplace setting.
- **Networking:** Build a professional network by meeting new people within the industry, establishing valuable connections that can lead to future opportunities.
- **Career Exploration:** Explore various business-related roles and gain insights into what it takes to be a successful professional in the business world.
- **Project Management:** Learn strategies for managing multiple tasks (multi-tasking), meeting deadlines, and overseeing projects within an industrial setting.