Progressive Education Society's

Modern College of Arts, Science and Commerce (Autonomous), Shivajinagar, Pune 5

(An Autonomous College Affiliated to Savitribai Phule Pune University)

Framework of Syllabus for BCA (Science)

Choice Based Credit System
(CBCS) Syllabus Under National
Education Policy (NEP)

To be implemented from Academic Year 2024-2025

Level:- 4.5 (First Year) Sem:I

Course Type	Course Code	Course Title	Credits		Teaching Scheme Hr/Week		Evaluation Scheme and Max Marks		
			TH	PR	TH	PR	CE	ESE	Total
Subject 1 T(2)+ (T/P)(2) or T(4)	24CsBCAU1101	Programming in 'C'	2		2		20	30	50
	24CsBCAU1102	Lab Course on Programming in 'C' (24CsBCAU1101)		2		4	20	30	50
Subject 2 T(2)+ (T/P) (2) or T(4)	24CsBCAU1201	Lab on DBMS		2		4	20	30	50
	24CsBCAU1202	Mathematical Foundation		2		4	20	30	50
Subject 3 T(2)+ (T/P)(2) or T(4)	24CsBCAU1301	Project Management - I (Software Analysis and Design)	2		2		20	30	50
	24CsBCAU1302	User Interface Designing		2		4	20	30	50
IKS T(2)	24CpCopU1901	Generic IKS	2		2		20	30	50
GE/OE (T/P) (2)	24CsCopU1401	Computer Fundamentals	2		2		20	30	50
SEC (P) (2)	24CsBCAU1601	Lab on Statistical Methods		2		4	20	30	50
AEC T(2)	24CpCopU1701 /24CpCopU1702	MIL-I (Hindi) / MIL-I (Marathi)	2		2		20	30	50
VECT (2)	24CpCopU1801	EVS-I	2		2		20	30	50
Total			14	08	14	16			550

Level:- 4.5 (First Year) Sem:II

Course Type	Course Code	Course Title	Credits		Teaching Scheme Hr/Week		Evaluation Scheme and Max Marks		
			TH	PR	TH	PR	CE	ESE	Total
Subject 1 T(2)+ T/P(2) or T(4)	24CsBCAU2101	Advanced Programming in 'C'	2		2		20	30	50
	24CsBCAU2102	Lab Course on Advanced Programming in 'C' (24CsBCAU2101)		2		4	20	30	50
Subject 2 T(2)+ T/P(2) or T(4)	24CsBCAU2201	Advanced Database Management System	2		2		20	30	50
	24CsBCAU2202	Lab Course on Advanced DBMS (24CsBCAU2201)		2		4	20	30	50
Subject 3 T(2)+ T/P(2) or T(4)	24CsBCAU2301	Project Management - II (SE Practices)	2		2		20	30	50
	24CsBCAU2302	Case study: Project Report		2		4	20	30	50
GE/OE (T/P)(2)	24CsCopU2401	Digital Marketing	2		2		20	30	50
SEC P(2)	24CsBCAU2601	Computer Organization	2		2		20	30	50
AEC T(2)	24CpCopU2703	English Communication Skills I	2		2		20	30	50
VEC T(2)	24CpCopU2801	Democracy, Election and Governance	2		2		20	30	50
CC(2)	24CpCopU2001/ 24CpCopU2011 / 24CpCopU2021 / 24CpCopU2031 / 24CpCopU2041 / 24CpCopU2051 / 24CpCopU2061 / 24CpCopU2071	Physical Education / Cultural Activities / NSS / NCC / Fine Arts / Applied Arts / Visual Arts / Performing Arts	2		2		20	30	50
Total			16	06	16	12			550

Level:- 5.0 (Second Year) Sem:III

Course Type	Course Code	Course Title	Credits		Teaching Scheme Hr/Week		Evaluation Scheme and Max Marks		
			TH	PR	TH	PR	CE	EE	Total
Major Core T(2+2 or 4), (T/P)(2)	24CsBCAU3101	Data Structure	2		2		20	30	50
	24CsBCAU3102	Object Oriented Programming using CPP	2		2		20	30	50
	24CsBCAU3103	Lab Course on 24CsBCAU3101 and 24CsBCAU3102		2		4	20	30	50
VSC P(2)	24CsBCAU3501	Lab on Advanced spreadsheet concepts using R package		2		4	20	30	50
IKS (T/P)(2)	24CsBCAU3901	Vedic Maths and Computer Fundamentals	2		2		20	30	50
FP P(2)	24CsBCAU3002	Field Project I		2		4	20	30	50
Minor (T/P)(2+2 or 4)	24CsBCAU3301	Project Management - III (Object Oriented Software Engineering)	4		4		40	60	100
GE/OE (T/P) (2)	24CsCopU3401	Cyber Security	2		2		20	30	50
AEC T(2)	24CpCopU3703	English Communication Skills II	2		2		20	30	50
CC T(2)	24CpCopU3001	Online Course on Yoga	2		2		20	30	50
Total			16	06	16	12			550

Level:- 5.0 (Second Year) Sem:IV

Course Type	**Course Code**	**Course Title**	**Credits**		**Teaching Scheme Hr/Week**		**Evaluation Scheme and Max Marks**		
			TH	PR	TH	PR	CE	EE	Total
Major Core T(2+2 or 4), (T/P)(2)	24CsBCAU4101	Operating Systems	2		2		20	30	50
	24CsBCAU4102	Python Programming-I	2		2		20	30	50
	24CsBCAU4103	Lab Course on Operating system and Python Programming-I (24CsBCAU4101 & 24CsBCAU4102)		2		4	20	30	50
VSC P(2)	24CsBCAU4501	Lab on Web Technologies-I		2		4	20	30	50
CEP P(2)	24CsCopU4003	Community Engagement Project		2		4	20	30	50
Minor (T/P)(2+2 or 4)	24CsBCAU4301	Project Management - IV (Software Project Management)	4		4		40	60	100
GE/OE (T/P) (2)	24CsCopU4401	Web Designing		2		4	20	30	50
SEC T(2)	24CsBCAU4601	Introduction to Data Science	2		2		20	30	50
AEC T(2)	24CpCopU4701 / 24CpCopU4702	MIL-II (Hindi) / MIL-II (Marathi)	2		2		20	30	50
CC T(2)	24CpCopU4001	Health and Wellness	2		2		20	30	50
Total			14	08	14	16			550

Level:- 5.5 (Third Year) Sem:-V

Course Type	Course Code	Course Title	Credits		Teaching Scheme Hr/Week		Evaluation Scheme and Max Marks		
			TH	PR	TH	PR	CE	EE	Total
Major Core T(2+2+2+2or 4 + 2+2 or 4 + 4) P(2+2 or 4)	24CsBCAU5101	Programming in Java	2		2		20	30	50
	24CsBCAU5102	Python Programming-II	2		2		20	30	50
	24CsBCAU5103	Server side scripting languages	4		4		40	60	100
	24CsBCAU5104	Lab Course on Programming in Java (24CsBCAU5101)		2		4	20	30	50
	24CsBCAU5105	Lab Course on Python Programming-II (24CsBCAU5102)		2		4	20	30	50
Major Elective (T/P) (2+2 or 4)	24CsBCAU5201	Data Mining and Data Warehousing	4		4		40	60	100
	24CsBCAU5202	Computer Networks and Cyber Security	4		4		40	60	100
VSC P(2)	24CsBCAU5501	Lab Course on Web Technologies-II		2		4	20	30	50
FP (2)	24CsBCAU5001	Field Project II		2		4	20	30	50
Minor (T/P) (2)	24CsBCAU5302	Project Management - IV (Software Testing)	2		2		20	30	50
Total			14	8	14	16			550

Level:- 5.5 (Third Year) Sem:-VI

Course Type	Course Code	Course Title	Credits		Teaching Scheme Hr/Week		Evaluation Scheme and Max Marks		
			TH	PR	TH	PR	CE	EE	Total
Major Core T(2+2+2+2 or 4+2+2 or 4+4) P(2+2 or 4)	24CsBCAU6101	Programming in Advanced Java	2		2		20	30	50
	24CsBCAU6102	Mobile Computing (Theory)	2		2		20	30	50
	24CsBCAU6103	Data Analytics	4		4		40	60	100
	24CsBCAU6104	Lab Course on Programming in Advanced Java (24CsBCAU6101)		2		4	20	30	50
	24CsBCAU6105	Lab on Android Programming		2		4	20	30	50
Major Elective (T/P) (2+2 or 4)	24CsBCAU6201	Database Technologies	2		2		20	30	50
	24CsBCAU6202	Lab on Database Technologies		2		4	20	30	50
	24CsBCAU6203	Cloud Computing	4		4		40	60	100
VSC P(2)	24CsBCAU6501	Project Lab		2		4	20	30	50
OJT (2)	24CsBCAU6004	On Job Training		4		8	40	60	100
Total			12	10	14	20			550

Syllabus

SEM-I

Progressive Education Society's

Modern College of Arts, Science and Commerce,
Shivajinagar, Pune - 5
First Year of B.C.A. (Science)
(NEP 2024)

Course Code: 24CsBCAU1101 **Course Name:** Programming in 'C'

Teaching Scheme: TH:2 Hours/Week **Credit: 02**

Examination Scheme: CIA : 20 Marks **End-Sem : 30 Marks**

Prerequisite Courses:

- Fundamentals of Mathematics
- Understanding of Computer systems (Input-Process-Output)

Course Objectives:

- To develop logic which will help them to create programs, applications in C.
- By learning the basic programming constructs, they can easily switch over to any other language in future.

Course Outcomes:

On completion of the course, student will be able to–

- Control the sequence of the program and give logical outputs.
- Understanding a defensive programming concept.
- Ability to handle possible errors during program execution.

Course Name: Programming in C

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List the features, constructs, and data types of C programming.	L1
CO2	Demonstrate the use of operators, control statements, and input/output functions in programs.	L2
CO3	Apply arrays, functions, and modular programming to solve computational problems.	L3
CO4	Analyze program flow and debug errors using defensive programming.	L4

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO5	Evaluate different logic-building approaches for efficient problem-solving.	L5
CO6	Design and develop structured programs using C to solve real-life problems.	L6

Course Contents

Unit No.	Title	Lectures
Unit 1	**Introduction to C Programming**	**05 lectures**
	1. Introduction to C 2. Features of C 3. Algorithms and Flowcharts 4. Structure of C Program 5. Simple Programs	
Unit 2	**C Fundamentals**	**05 lectures**
	1. C Character Set, Identifiers and Keywords 2. Variables and constants 3. Data types 4. Type casting 5. Declarations, Expressions	
Unit 3	**Operators and Expressions**	**05 lectures**
	1. Arithmetic operators 2. Pre and Post Increment & Decrement operators 3. Relational and logical operators 4. Assignment operators 5. Comma operator, size of operator 6. Ternary conditional operator 7. Precedence and associatively	
Unit 4	**Data Input Output Statements**	**04 lectures**
	1. printf, scanf functions 2. getchar, putchar, getch functions 3. Escape sequence characters 4. Format specifies	
Unit 5	**Control Statements**	**06 lectures**
	1. If, If- Else & Nested If	

	Statements 2. Conditional Branching – Switch a. statement 3. Loop Statement (while, do…while, for) 4. Break, continue, goto statements	
Unit 6	**Arrays**	**05 lectures**
	1. Introduction 2. Array Declarations 3. Single dimensional Arrays 4. Two dimensional Arrays	

Reference Books:

1.The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, ISBN:9788120305960, PHI Learning

2. How to Solve it by Computer, R.G. Dromey, ISBN: 9788131705629, Pearson Education

3. A Structured Programming Approach Using C, Behrouz A. Forouzan, Richard F. Gilberg ISBN:9788131500941, Cengage Learning India

4. Programming in ANSI C, E. Balaguruswamy, ISBN: 9781259004612, Tata Mc-Graw Hill Publishing Co Ltd.-New Delhi

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Modern College of Arts, Science and Commerce,
Shivajinagar, Pune - 5
First Year of B.C.A. (Science)
(NEP 2024)

Course Code: 24CsBCAU1102 **Course Name:** Lab Course on 'C' Programming

Teaching Scheme: P:4 Hours/Week **Credit: 02**

Examination Scheme: CIA : 20 Marks **End-Sem : 30 Marks**

1. Assignment to demonstrate use of data types, simple operators (expressions).

2. Assignment to demonstrate decision making statements (if , if-else, nested if - else statements).

3. Assignment to demonstrate decision making statements (switch case).

4. Assignment to demonstrate use of while loop, Do-while loop.

5. Assignment to demonstrate use of for loop.

6. Assignment to demonstrate menu driven programs.

7. Assignment to demonstrate use of arrays (1-d arrays and 2-d arrays).

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(NEP 2024)

Course Code : 24CsBCAU1201 **Course Name :** Lab on DBMS

Teaching Scheme: P : 4 Hours/Week **Credit: 02**

Examination Scheme: CIA : 20 Marks **End-Sem : 30 Marks**

Prerequisite Courses:

- General purpose programming language knowledge

Course Objectives:

- To Understand the use of Structured Query Language (SQL) and learn SQL syntax.

- Learn and practice data modeling using the entity-relationship and developing database designs.

Course Outcomes:

On completion of the course, student will be able to–

- To understand the features of Database Management Systems and Relational Database.
- To use SQL- the standard language of relational databases.

Course Name: Lab on DBMS

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List and describe basic concepts of databases, data, information, and DBMS features.	L1
CO2	Demonstrate SQL commands (DDL, DML, constraints, joins, aggregate functions) for database operations.	L2
CO3	Apply SQL queries to create, modify, and retrieve data from relational databases.	L3
CO4	Analyze database schemas and relationships using ER models and normalization.	L4
CO5	Evaluate query results and integrity constraints for correctness and efficiency.	L5
CO6	Design normalized database schemas and implement them with SQL commands.	L6

Course Contents

Unit No.	Title	Lectures
Unit 1	**Introduction to Database Concepts**	**2 Practical**
	1. Data 2. Information 3. Database 4. DBMS 5. Data Dictionary 6. File system Vs. DBMS 7. Database Languages	

Unit 2	**SQL**	**5 Practical**
	1. Introduction 2. Data types 3. Basic structure of SQL queries 4. Integrity Constraints (primary key, referential integrity, not null constraint, unique constraint & check constraint) 5. Aggregate functions 6. SQL mechanisms for joining relations	
Unit 3	**DDL Commands**	**4 Practical**
	1. Types of DDL statements 2. Syntax of CREATE, DROP, ALTER & TRUNCATE 3. Examples	
Unit 4	**DML Commands**	**4 Practical**
	1. Types of DML statements 2. Syntax of SELECT, INSERT, DELETE & UPDATE 3. Examples	

Reference Books:

1. Database System Concepts, Henry F. Korth, Abraham Silberschatz, S. Sudarshan, ISBN-13. 978-9332901384, Tata McGraw-Hill Education

2. Database Management Systems, Raghu Ramakrishnan and Johannes Gehrke, ISBN-13. 978-0072465631 McGraw-Hill Science/Engineering/Math;

3. Database Systems, Shamkant B. Navathe, RamezElmasri, ISBN-10. 0805317554 Pearson Higher Education

Websites:

1. https://www.tutorialspoint.com/postgresql/

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First Year of B.C.A. (Science)
(NEP 2024)

Course Code : 24CsBCAU1202 **Course Name: Mathematical Foundation**

Teaching Scheme: TH: 2 Hours/Week **Credit: 02**

Examination Scheme: CIA: 20 Marks **End-Sem: 30 Marks**

Prerequisite Courses:

- Fundamentals of mathematical concepts

Course Objectives:

- To Study basic logic statements including compound statements
- To learn fundamentals of graphs and matrices

Course Outcomes:
On completion of the course, student will be able to–

- Design and be able to apply basic counting techniques
- Student should be able to present a coherent and mathematically accurate argument.

Course Name: Mathematical Foundation

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List and explain fundamental concepts of logic, proofs, integers, graphs, and matrices.	L1
CO2	Demonstrate the ability to construct truth tables, logical connections, and proofs.	L2
CO3	Apply divisibility, modular arithmetic, and Euclidean algorithm in problem solving.	L3
CO4	Analyze properties of graphs and matrices to solve discrete mathematical problems.	L4

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO5	Compare different graph types, algorithms, and matrix operations for efficiency.	L5
CO6	Design mathematical models using graphs, matrices, and logic for real-world computing problems.	L6

Course Contents

Unit No.	Title	Lectures
Unit 1	**Language and proofs**	**08 lectures**
	1. Quantifiers and Logical statements 2. Truth tables, Logical connections 3. Compound Statements 4. Predicates 5. Elementary Proof Techniques	
Unit 2	**Integers**	**07 lectures**
	1. Divisibility of Integers 2. Definition and Properties 3. Division Algorithm 4. Divisibility and its properties 5. Euclidean Algorithm 6. Properties of GCD 7. Modular Arithmetic	
Unit 3	**Graphs**	**10 lectures**
	1. Definition and examples 2. Incidence and degree 3. Handshaking Lemma 4. Isomorphism 5. Subgraphs, walk, path, circuits, connected graphs 6. Euler graph, operations on graph, Hamiltonian graph 7. Directed graphs, planar graph, graph coloring	
Unit 4	**Matrices**	**05 lectures**
	1. Definition of matrix 2. Matrix operations 3. Transpose and powers of matrices 4. Types of matrices 5. Solving Systems of linear equations	

Reference Books:

1. Discrete Mathematical Structures : Bernard Kolman, Robert C. Busby, Sharon Cutler Ross, Nadeen-Ur-Rehman. ISBN number 9332549591
2. Discrete Mathematics And Its Applications: Rosen, ISBN - 9390727359
3. Discrete Mathematics with Applications, Thomas Koshy, Elsevier Academic Press, ISBN: 9788181478870
4. Discrete Structures, Logic, and Computability, James Hein, Jones & Barlett Student Edition, ISBN:9789380108391

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First Year of B.C.A. (Science)
(NEP 2024)

Course Code: 24CsBCAU1301

Course Name: Project Management-I (Software analysis and design)

Teaching Scheme: :2 Hours/Week **Credit: 02**

Examination Scheme: CIA : 20 Marks **End-Sem : 30 Marks**

Course Outcomes:

- Understand the principles and tools of systems analysis and design
- Analyze a problem and design an appropriate solution using a combination of software development tools and techniques.

- Define and describe the phases of the system development life cycle.
- Determine methods for evaluating the effectiveness and efficiency of a system.

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List and describe the characteristics, elements, and types of systems in software development.	L1
CO2	Demonstrate understanding of the phases of the System Development Life Cycle (SDLC).	L2
CO3	Apply structured analysis tools (DFD, decision trees, decision tables, data dictionary) to represent system requirements.	L3
CO4	Analyze feasibility studies, cost–benefit analysis, and system requirements for decision-making.	L4
CO5	Evaluate design alternatives, user interface standards, and database organization methods for efficiency.	L5
CO6	Design system models, prototypes, and input/output forms for real-world applications.	L6

Unit No.	Title	Lectures
Unit 1	**Introduction**	**4 lectures**
	1. System Definition 2. Characteristics of a System: Organization, Subsystem, Interaction, Interdependence, Integration, Central objective 3. Elements of a system: Outputs, Inputs, Processor(s), Control, Feedback, Environment, Boundaries, Interface. Types of Systems: Physical & Abstract Systems, Open & Closed Systems, Computer-based Systems (MIS: Management Information System & DSS: Decision Support System)	
Unit 2	**Systems Development Life Cycle (SDLC)**	**6 lectures**
	1. Introduction to Systems Development Life Cycle (SDLC) 2. Activities of SDLC • Preliminary Investigation (Request Clarification, Feasibility Study, Request Approval), • Determination of System Requirements, • Design of system , • Development of Software, • System Testing (Unit Testing, Integration testing, System Testing),	

	• System Implementation & Evaluation, • System Maintenance • System Prototype method and spiral model • Systems Analyst: Role and Need of Systems Analyst, Qualifications and responsibilities, System Analysis as a Profession	
Unit 3	**Systems Analysis**	**10 lectures**

	1. System planning & Initial Investigation
	2. Information Gathering
	3. Tools of structured analysis
	  • Structured English, Decision Tree & Decision Table
	  • Data flow diagram(DFD), Data Dictionary
	4. Feasibility study
	5. Cost/Benefit analysis	

Unit 4	**System Design**	**10 lectures**

	1. Process Modeling, logical and physical design
	2. Conceptual Data Modeling
	3. Input/output & Form Design
	  • Classification of forms, Input/output forms design.
	  • User-interface design, Graphical interfaces.
	  • Standards and guidelines for GUI design
	4. File Organization & Database Design	

References: -

1. System Analysis and Design Elias M. Awad, Galgotia Publication, Second Edition,ISBN: 978-8175156180
2. System analysis and Design of Information system by James Senn, Second Edition, ISBN: 978-0070562363
3. System Analysis and Design Methods, Whitten, Bentaly and Barlow, Galgotia Publication, seventh edition, ISBN: 978-0073052335
4. Modern System Analysis and Design, Jeffrey A. Hofer Joey F. George Joseph S. Valacich Addison Weseley, ISBN: 978-0805324990

Progressive Education Society's

Modern College of Arts, Science and Commerce,

Shivajinagar, Pune - 5

First Year of B.C.A. (Science)

(NEP 2024)

Course Code :24CsBCAU1302 **Course Name : User Interface Designing**

Teaching Scheme: P : 4 Hours/Week **Credit: 02**

Examination Scheme: CIA : 20 Marks **End-Sem : 30 Marks**

Prerequisite Courses:

- Knowledge of basic Computer hardware and software is necessary

Course Objectives:

- Define the basics in web design
- Visualize the basic concept of HTML and CSS

Course Outcomes:

On completion of the course, student will be able to–

- Implement interactive web page(s) using HTML, CSS
- Design a responsive web site using HTML and CSS

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List and describe the basics of web design, HTML structure, and tags.	L1
CO2	Demonstrate the use of HTML elements such as tables, forms, multimedia, and lists to create webpages.	L2
CO3	Apply CSS properties and selectors to style and format webpages effectively.	L3
CO4	Analyze webpage design for usability, responsiveness, and accessibility.	L4
CO5	Evaluate different design approaches for interactive and responsive websites.	L5
CO6	Design and develop complete interactive webpages using HTML and CSS.	L6

Course Contents

Unit No.	Title	Lectures
Unit 1	**Introduction to HTML**	**3 Practical**
	1. What is HTML Documents 2. Basic structure of an HTML document 3. Creating an HTML document 4. HTML Basic Tags 5. HTML – FORMATTING Tags 6. HTML – IMAGES 7. HTML – LISTS	
Unit 2	**HTML – Tables**	**4 Practical**
	1. Table Tags 2. Cellpadding and Cellspacing Attributes 3. Colspan and Rowspan Attributes 4. Tables Backgrounds 5. Table Height and Width 6. Table Caption 7. Table Header, Body, and Footer Nested Tables	
Unit 3	**Advanced HTML tags**	**5 Practical**
	1. Embedding Audio and Video 2. Working with Text 3. Working with Frames 4. Working with Multimedia 5. Working with Forms and controls	
Unit 4	**Introduction to Cascading Style Sheets**	**3 Practical**
	1. Concept of CSS 2. Creating Style Sheet 3. CSS Properties 4. CSS Styling (Background, Text Format, Controlling Fonts) 5. CSS Id and Class 6. Box Model (Introduction, Border properties, Padding Properties, Margin properties)	

Reference Books : -

1. Complete HTML- Thomas Powell, fifth edition, McGrawHill publication, ISBN:9780070701946

2. HTML and JavaScript–Ivan Bayross, fourth edition, BPB publication, ISBN:978818330084

Reference Links

1. https://www.tutorialspoint.com/

2. https://www.w3schools.com/

Progressive Education Society's
Modern College of Arts, Science and Commerce,
Shivajinagar, Pune - 5
First Year of B.C.A. (Science) (B.C.A. Science)
(NEP 2024)

Course Code : 24CsBCAU1601 **Course Name :** Lab on Statistical Methods

Teaching Scheme: P: 4 Hours/Week **Credit: 02**

Examination Scheme: CIA : 20 Marks **End-Sem : 30 Marks**

Prerequisite Courses:

- Basic understanding of Statistical concepts

Course Objectives:

- To understand and master the concepts, techniques & applications of Statistical Methods.
- To develop the skills of solving real life problems using Statistical methods.
- To make students understand the art of applying statistical techniques to solve real-life problems
- To gain knowledge of Statistical Computations

Course Outcomes:
On completion of the course, student will be able to–

- Perform statistical analysis

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List and explain basic statistical concepts such as data, central tendency, dispersion, correlation, and probability.	L1
CO2	Demonstrate computation of statistical measures using appropriate formulas and tools.	L2
CO3	Apply statistical methods (mean, median, mode, regression, permutations, combinations) to solve practical problems.	L3
CO4	Analyze real-life datasets using graphical representation and statistical techniques.	L4
CO5	Evaluate the accuracy and reliability of statistical results for decision-making.	L5
CO6	Design and implement statistical experiments or case studies to address real-world problems.	L6

Course Contents

Expt.no.	Title of Experiment/ Practical
1	Graphical Representation of Data
2	Measures of Central Tendency-I
3	Measures of Central Tendency-II
4	Measures of Dispersion-I
5	Measures of Dispersion-II
6	Correlation
7	Linear Regression
8	Permutations and Combinations

9	Probability-I
10	Probability-II
11	Problem Set-I
12	Problem set-II

Reference Books:

1) S.C. Gupta -Fundamentals of Statistics, ISBN-13: 978-8183183390

2) J.S Chandran -Statistics for Business and Economics, ISBN 978-1-5230-9514-8

3) S. P Gupta -Statistical Methods, ISBN-13: 978-0074634981

4) S.C Gupta, Gupta Indra -Business Statistics, ISBN: 8183184170

5) Amir D Aczel, JayavelSounderpandian -Complete Business statistics, ISBN-13: 978-0077108601

6) D.N. Elhance -Fundamentals of Statistics, ISBN-13: 978-8122500332

SEM-II

Progressive Education Society's

Modern College of Arts, Science and Commerce,

Shivajinagar, Pune - 5

First Year of B.C.A. (Science)

(NEP 2024)

Course Code : 24CsBCAU2101 **Course Name :** Advanced Programming in 'C'

Teaching Scheme: TH: 2 Hours/Week **Credit: 02**

Examination Scheme: CIA : 20 Marks **End-Sem : 30 Marks**

Prerequisite Courses:

- Knowledge of basic 'C' Programming

Course Objectives:

- To Study broad overview of problem-solving techniques
- To learn the use of Advanced 'C' programming to solve these problems

Course Outcomes:

On completion of the course, the student will be able to

- Develop small applications with the use of features such as String, Pointers, Structures and Union, Files and preprocessor directives in C Language

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List and explain advanced C concepts such as functions, strings, pointers, structures, and file handling.	L1
CO2	Demonstrate the use of library functions, storage classes, and preprocessor directives in C programs.	L2
CO3	Apply pointers, arrays, and structures to solve computational problems efficiently.	L3
CO4	Analyze program logic using recursion, command line arguments, and dynamic memory concepts.	L4
CO5	Evaluate alternative programming approaches for efficiency and error handling.	L5
CO6	Design and implement small-scale applications using advanced features of C language.	L6

Course Contents

Unit No.	Title	Lectures
Unit 1	**Function**	**6 lectures**
	1. Introduction to Functions 2. Function Arguments 3. Library functions (Math, String…) 4. User defined functions 5. Methods of Calling Function 6. Recursive and non-recursive functions 7. Storage Classes	
Unit 2	**Strings**	**6 lectures**
	1. Concept of a String 2. Declaration, definition, initialization, format specifiers 3. String literals/ constants & variables – reading & writing from & to console 4. Importance of terminating NULL character 5. Predefined functions in string.h 6. command line arguments	
Unit 3	**Pointers**	**5 lectures**
	1. Concept – reference & dereference (Data model – Value model v/s Reference model) 2. Declaration, definition, initialization & use 3. Types of pointers 4. Pointer Arithmetic 5. Relationship between Arrays & Pointers	
Unit 4	**Structures and Union**	**5 lectures**
	1. Concept of structure 2. Declaration, definition, 3. Initialization, accessing structure members 4. Nested structures 5. Concept of Union	
Unit 5	**File Handling**	**5 lectures**
	1. Concept of streams, need of files 2. Types of files 3. Operations on text, binary files 4. Random access to files 5. File handling Examples	
Unit 6	**Preprocessor**	**3 lectures**
	1. Concept 2. Format of preprocessor directives 3. File inclusion directives (#include) 4. Macro substitution directives (#define) 5. Parameterized macros	

	6. Macros versus functions	

Reference Books:

1. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, ISBN:9788120305960, PHI Learning

2. How to Solve it by Computer, R.G. Dromey, ISBN: 9788131705629, PearsonEducation

3. A Structured Programming Approach Using C, Behrouz A. Forouzan, Richard F. Gilberg ISBN:9788131500941, Cengage Learning India

4. Programming in ANSI C, E. Balaguruswamy, ISBN: 9781259004612, Tata Mc-Graw Hill Publishing Co Ltd.-New Delhi

Progressive Education Society's
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Shivajinagar, Pune - 5
First Year of B.C.A. (Science)
(NEP 2024)

Course Code : 24CsBCAU2102 **Course Name :** Lab on Advanced Programming in 'C'

Teaching Scheme: TH:4 Hours/Week **Credit: 02**

Examination Scheme: CIA : 20 Marks **End-Sem : 30 Marks**

Advanced Programming in 'C'

1. Assignment to demonstrate use of function.
2. Assignment to demonstrate concept of strings.
3. Assignment to demonstrate pointers
4. Assignment to demonstrate structures
5. Assignment to demonstrate command line arguments
6. Assignment to demonstrate preprocessor directives.
7. Assignment to demonstrate file handling

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First Year of B.C.A. (Science)

(NEP 2024)

Course Code : 24CsBCAU2201 **Course Name :** Advanced Database Management System

Teaching Scheme: T:2 Hours/Week **Credit: 02**

Examination Scheme: CIA : 20 Marks **End-Sem : 30 Marks**

Prerequisite Courses:

- Student should have Basic Knowledge of DBMS is required.
- Basic Knowledge of ER model, relational design ,SQL Queries is required

Course Objectives:

- To learn fundamental concepts of RDBMS (PL/PgSQL).
- To learn database management operations.
- To understand the basic issues of transaction processing and concurrency Control
- To study data security and its importance

Course Outcomes:

On completion of the course, student will be able to–

- Design E-R Model for given requirements and convert the same into database tables.

- Explain transaction Management in relational database System.
- Use advanced database Programming concepts.

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List and describe advanced RDBMS concepts including PL/pgSQL, transactions, concurrency, and recovery.	L1
CO2	Demonstrate the use of PL/pgSQL constructs such as control structures, functions, cursors, and triggers.	L2
CO3	Apply advanced SQL queries and database programming techniques for data manipulation.	L3
CO4	Analyze transaction management issues, concurrency control mechanisms, and deadlock handling.	L4
CO5	Evaluate recovery techniques, database security methods, and efficiency of query execution.	L5
CO6	Design advanced database solutions incorporating distributed, object-based, and NoSQL concepts.	L6

Course Contents

Unit No.	Title	Lectures
Unit 1	**PL/pgSQL Introduction**	**12 Lectures**
	1. pgAdmin - Introduction 2. Datatypes 3. Table creation in pgAdmin, Constraints 4. Viewing and Editing Data 5. Introduction to PL/pgSQL 6. Control Structures: Conditional statements, 7. Loop statements 8. Views 9. Functions 10. Handling errors and exceptions 11. Cursors 12. Triggers	
Unit 2	**Transaction Concepts and Concurrency Control**	**12 Lectures**

	1. Transaction, properties of transaction, states 2. of transactions 3. Concurrent execution of transactions and 4. conflicting operations 5. Schedules, types of schedules 6. Concept of Serializability, conflict 7. Serializability 8. Lock based protocols 9. Two phase locking protocol (2PL) 10. Timestamp ordering protocol 11. Deadlock handling methods 12. Detection and Recovery (Wait for graph) 13. Prevention algorithms (Wound-wait, Wait- die)	
Unit 3	**Crash Recovery**	**03 Lectures**
	1. Transaction Failure classification 2. Recovery concepts 3. Checkpoints 4. Recovery with concurrent transactions (Rollback, checkpoints, commit) 5. Log base recovery techniques (Deferred and Immediate update)	
Unit 4	**Database Security**	**01 Lecture**
	1. Introduction to database security concepts 2. Methods for database security	
Unit 5	**Introduction to Other Databases**	**02 Lectures**
	1. Parallel and distributed Databases 2. Object Based Databases 3. XML Databases 4. NoSQL Database 5. Multimedia Databases	

Reference Books:

1. Database System Concept by Avi Silberschatz, Henry F. Korth, S. Sudarshan, 6th Edition-McGraw-Hill ISBN-10: 0073523321

2. Fundamentals of Database Systems by Ramez Elmasri, Shamkant Navathe, 5th Edition–Pearson.

3. Practical Postgresql by JoshuaD. Drake, John C Worsley, O'Reilly

Publications. ISBN: 9781449309770

4. Database Management Systems by Raghu Ramakrishnan, 3rd Edition, Tata

McGraw Hill ISBN: 9789339204075, 9339204077

5. Database Management System by Bipin Desai , ISBN: 0314667717, 9780314667717

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Shivajinagar, Pune - 5

First Year of B.C.A. (Science)

(NEP 2024)

Course Code : 24CsBCAU2202 **Course Name :** Lab Course on Advanced DBMS

Teaching Scheme: P : 4 Hours/Week **Credit: 02**

Examination Scheme: CIA : 20 Marks **End-Sem : 30 Marks**

Prerequisite Courses:

- Student should have Basic Knowledge of DBMS is required.
- Basic Knowledge of ER model, relational design ,SQL Queries is required

Course Objectives:

- To learn fundamental concepts of RDBMS (PL/PgSQL).
- To learn database management operations.

Course Outcomes:

On completion of the course, student will be able to–

- Design E-R Model for given requirements and convert the same into database tables.
- Use database techniques such as SQL & PL/SQL(function, procedure, exception, cursors and triggers)

Course Contents

Sr.No	Title of the assignment
1	Nested queries
2	Views
3	Functions and stored Procedures
4	Error and exception Handling
5	Cursors
6	Trigger

Reference Books:

1. Database System Concept by Avi Silberschatz, Henry F. Korth, S. Sudarshan, 6th Edition-McGraw-Hill ISBN-10: 0073523321

2. Practical Postgresql by JoshuaD. Drake, John C Worsley, O'Reilly Publications. ISBN: 9781449309770

3. Database Management Systems by Raghu Ramakrishnan, 3 rd Edition, Tata McGraw Hill ISBN: 9789339204075, 9339204077

4. Database Management System by Bipin Desai , ISBN: 0314667717, 9780314667717

Course Code: 24CsBCAU2301 **Course Name: Project Management – II (SE Practices)**

Teaching Scheme: TH: 2 Hours/Week **Credit:02**

Examination Scheme: CIA : 20 Marks **End-Sem : 30 Marks**

Prerequisite Courses:

- Computer Fundamentals
- Problem solving and programming in C

Course Objectives:

- To study phases in a software project
- To learn the fundamental concepts of requirements engineering and Analysis Modeling.
- To study the various software design methodologies

Course Outcomes:

On completion of the course, student will be able to –

- To identify unique features of various software application domains and classify software applications.
- To choose and apply appropriate lifecycle model of software development
- To analyze software requirements by applying various modeling techniques.
- To describe principles of agile development, distinguish agile process model from other process models

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List and describe software engineering concepts, software domains, and quality factors.	L1
CO2	Demonstrate understanding of the phases of SDLC, software reengineering, and reverse engineering.	L2
CO3	Apply different process models (Waterfall, Incremental, Spiral, RAD, Agile) to software development.	L3
CO4	Analyze software requirements using elicitation, negotiation, and specification techniques.	L4

CO5	Evaluate structured analysis and design tools such as DFDs, ER diagrams, and data dictionaries for efficiency.	L5
CO6	Design software models and agile-based solutions for real-world projects.	L6

Course Contents:

Unit No.	Title	Lectures
Unit 1	**Software and Software Engineering**	**4 lectures**
	1. The Nature of Software • Defining Software • Software Application Domain • Legacy Software 2. Software Engineering 3. McCall's Quality Factors	
Unit 2	**System Development Life Cycle (SDLC)**	**6 lectures**
	1. Introduction 2. Activities of SDLC • Preliminary Investigation (Request Clarification, Feasibility Study, Request Approval) • Determination of System Requirements • Design of system • Development of Software • System Testing (Unit Testing, Integration testing, System Testing) • System Implementation & Evaluation • System Maintenance o Definition and types o Software Reengineering o Reverse Engineering o Restructuring and forward Engineering	
Unit 3	**Process Models**	**6 lectures**
	1. A Generic Process Model 2. Prescriptive Process Models • The Waterfall Model • Incremental Process Models o RAD Model • Evolutionary Process Models o Prototyping o Spiral Model	
Unit 4	**Requirements Engineering**	**4 lectures**
	1. Introduction	

	2. Requirements Engineering Task • Inception • Elicitation • Elaboration • Negotiation • Specification • Validation • Requirements Management 3. Feasibility Study 4. Fact Finding Techniques • Questionnaire • Interview • Record Review • Observation	
Unit 5	**Structured Analysis and Design Tools**	**6 lectures**
	1. Structured Analysis • What is Structured Analysis? • Components of Structured Analysis • What is Data Flow Analysis? 2. Features& Tools of Data Flow Analysis • Logical Data Flow Diagram (Logical DFD) • Notations • Drawing a Context Diagram • Exploding A Context diagram into Greater detail (1st level, 2nd Level DFD etc…) 3. E-R Diagram 4. Case Study 5. Concept of Data Dictionary	
Unit 6	**An Agile View of Process**	**4 lectures**
	1. What is an Agility? 2. What is an Agile Process? 3. Agile Process Models • Extreme Programming (XP) • Adaptive Software Development (ASD) • Dynamic Systems Development Method (DSDM)	

Note: *Case Study* should be considered as a part of *Internal Evaluation*

Reference books:

1. Software Engineering: A Practitioner's Approach by Roger S Pressman, Mcgraw-Hill, Seventh or 8th Edition, ISBN: 0073375977.
2. System analysis and Design of Information system by James Senn, McGraw-Hill, 2nd Edition, ISBN-10: 0070562369 ISBN-13: 978-0070562363
3. System Analysis, Design & introduction to Software Engineering(SADSE) by Parthsarthy, Khalkar., Everest Publishing House, 10th or 14th edition ISBN no. 978-81- 7660- 290-7

Progressive Education Society's

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Shivajinagar, Pune - 5
First Year B.C.A. (Science)
(NEP 2024)

Course Code: 24CsBCAU2302 **Course Name: Case Study: Project Report**

Teaching Scheme: TH:2 Hours/Week **Credit: 02**

Examination Scheme: CIA: 20 Marks **End-Sem: 30 Marks**

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List and describe the components of a project report including problem statement, requirements, and feasibility study.	L1
CO2	Demonstrate documentation of system requirements using DFDs, ER diagrams, and database designs.	L2
CO3	Apply structured analysis tools to prepare project artifacts such as input/output designs.	L3

CO4	Analyze the feasibility, scope, and objectives of the project for implementation.	L4
CO5	Evaluate project design alternatives for usability, efficiency, and correctness.	L5
CO6	Design and compile a comprehensive project report with all required documentation.	L6

Sr.No.	**Topic**
1	Problem statement
2	Requirement gathering
3	Feasibility study
4	Objectives
5	Context level DFD
6	First level DFD
7	Entity relationship diagram
8	Database design
9	Input screens and Output format design

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First Year B.C.A. (Science)
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Course Code: 24CsBCAU2601 **Course Name:** Computer Organization

Teaching Scheme: TH:2 Hours/Week **Credit: 02**

Examination Scheme: CIA: 20 Marks **End-Sem: 30 Marks**

Prerequisite Courses:

- Basic Understanding of Computer System

Course Objectives:

- This course introduces the students to the basic concepts of digital computer organization, plan and design.
- It aims to develop a fundamental understanding of the building blocks of the computer framework and highlights how these blocks are organized together to architect a digital computer framework.

Course Outcomes:

On completion of the course, student will be able to–

- Design and Simplify Combinational and sequential circuits using basic building blocks.
- Represent data in binary form, convert numeric data between different number systems and perform arithmetic operations in binary.
- Explain instruction cycle, pipelining and interrupts.
- Explain data communication between CPU, memory and I/O devices.

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List and explain data representation methods, number systems, codes, and basic computer architecture.	L1
CO2	Demonstrate the design and simplification of combinational and sequential circuits using logic gates, K-maps, and flip-flops.	L2
CO3	Apply concepts of arithmetic operations, registers, memory, and ALU design in problem solving.	L3
CO4	Analyze CPU organization, instruction cycles, pipelining, and interrupt mechanisms.	L4

CO5	Evaluate processor architectures (RISC, CISC, multicore, GPU) and memory hierarchies for performance.	L5
CO6	Design small-scale digital system models integrating CPU, memory, and I/O components.	L6

Course Contents

Unit No.	Title	Lectures
Unit 1	**Data Representation and Computer Architecture**	**6 lectures**
	1. Number System and inter-conversion. 2. 1's and 2's Complements 3. Data representation and arithmetic operations 4. Concept of parity code 5. BCD codes 6. Weighted and unweighted codes	
Unit 2	**Digital Logic Circuits**	**5 lectures**
	1. Logic Gates, Truth Tables, Boolean Algebra, Digital Circuits, Combinational Circuits, Introduction to Sequential Circuits 2. Circuit Simplification using Karnaugh Map, Flip-Flops 3. Concept of counters and types 4. Concept of registers and type	
Unit 3	**Digital Components (Fundamental building blocks)**	**5 lectures**
	1. Designing of combinational circuits- Half Adder, Full Adder, Decoders, Encoders, Multiplexers, Registers and Memory (RAM, ROM and their types), Arithmetic Microoperations, Binary Adder, Binary, Adder-Subtractor. 2. Stack organization (operation of stack, types of stacks, register stack and memory stack), Block diagram of ALU 3. Block diagram of CPU and its functions	
Unit 4	**Basic Computer Organization and Design**	**4 lectures**
	1. Bus organization, Micro programmed vs Hardwired Control, Instruction Codes, Instruction Format, Instruction Cycle, Instruction pipelining, Memory Reference, Register Reference and Input Output Instructions, Program Interrupt and Interrupt Cycle.	
Unit 5	**Processors**	**4 lectures**
	1. General register organization, Stack Organization, Addressing Modes,	

	2. Overview of Reduced Instruction Set Computer (RISC), Complex Instruction Set Computer 3. (CISC), Multicore processor and Graphics Processing Unit (GPU)	
Unit 6	**Memory and Input-Output Organization:**	**6 lectures**
	1. Memory hierarchy (main, cache and auxiliary memory), Input-Output Interface, Modes of Transfer: Programmed I/O, Interrupt initiated I/O, Direct memory access	

References

- David A. Patterson and John L. Hennessy. "Computer Organization and Design : The Hardware/Software interface", 5th edition, Elsevier, 2012.
- Mano, M. Computer System Architecture, 3rd edition, Pearson Education, 1993. Additional References
- Mano, M. Digital Design, Pearson Education Asia, 1995.
- Null, L., & Lobur, J. The Essentials of Computer Organization and Architecture. 5 th edition. (Reprint) Jones and Bartlett Learning, 2018.
- Stallings, W. Computer Organization and Architecture Designing for Performance 8 th edition, Prentice Hall of India, 2010

Open Electives

Progressive Education Society's
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First Year of B.C.A. (Science)
(NEP 2024)

Course Code: 24CsCopU1401 **Course Name:** Computer Fundamentals

Teaching Scheme: TH: 2 Hours/Week **Credit: 02**

Examination Scheme: CIA: 20 Marks **End-Sem: 30 Marks**

Prerequisite Courses:

Course Objectives:

- To study the basics of Computer System and to learn how to configure computer devices.

Course Outcomes:

On completion of the course, student will be able to–

- Understanding the concept of input and output devices of Computers
- Learn the functional units and classify types of computers, how they process information and how individual computers interact with other computing systems and

devices.

- Understand an operating system and its working, and solve common problems related to operating systems.

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List and explain the characteristics, types, and functional units of computers.	L1
CO2	Demonstrate the use of operating systems and basic troubleshooting techniques.	L2
CO3	Apply concepts of hardware, software, storage devices, and translators to configure a computer system.	L3
CO4	Analyze computer networking concepts including topologies, LAN, MAN, WAN, and Internet.	L4
CO5	Evaluate different computer types, operating systems, and hardware components for suitability.	L5
CO6	Design a basic computer configuration integrating hardware, software, and networking elements.	L6

Course Contents

Unit No.	Title	Lectures
Unit 1	**Introduction to Computer System**	**12 lectures**
	1. Introduction, Characteristics of Computers, Block diagram of computer 2. Types of computers and features- Mini Computers, Micro Computers, Mainframe Computers, Super Computers, Laptops and Tablets 3. Types of Programming Languages- Machine Languages, Assembly Languages, High Level Languages 4. Translators- Assembler, Compiler, Interpreter 5. Data Organization- Drives, Files, Directories 6. Devices: Primary And Secondary storage devices, I/O Devices	

	7. Concepts of Software: Types of software: System Software, Application Software, System Software	
Unit 2	**Operating System**	**08 lectures**
	1. Operating System concept 2. Evolution of Operating System. 3. Functions of Operating System. 4. Types of Operating Systems. 5. Detailed Study of Windows Operating System. 6. Introduction and Features of LINUX OS.	
Unit 3	**Networking**	**05 lectures**
	1. Concept 2. Basic Elements of a Communication System 3. Data Transmission Media 4. Topologies, LAN, MAN, WAN, Internet and Intranet	
Unit 4	**PC Hardware**	**05 lectures**
	1. Introduction of Hardware. 2. Type and Working of Hardware parts – Ports, 3. Motherboard, CPU. 4. Basic Input and Output Setting (BIOS), Network Interface Card(NIC), 5. Graphics card	

Reference Books:

1. Computer Fundamentals by P.K. Sinha &Priti Sinha, 3rd edition, BPB pub.
2. Computers Today by S. BasandraGalgotia Pub.
3. Microsoft Office 2000 by Vipra Computers, Vipra Printers Pvt. Ltd.
4. Advanced Microsoft Office 2000 by Meredith Flynin, Nita Rutkosky, BPB Pub
using Microsoft office 2007 by Ed Bott ,Woody Leonhard , Pearson publication
5. PC/HARDWARE BY-Join Josh O`Reilly Publication

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First Year of B.C.A. Science
(NEP 2024)

Course Code: 24CsCopU2401 **Course Name:** Digital marketing

Teaching Scheme: TH: 2 Hours/Week **Credit: 2**

Examination Scheme: CIA: 20 Marks **End-Sem: 30 Marks**

Prerequisite Courses:
- Knowledge and Interest in Digital Platforms

Course Objectives:
- Develop a digital marketing plan that will address common marketing challenges.
- Articulate the value of integrated marketing campaigns across SEO, Paid Search, Social, Mobile, Email, Display Media, and Marketing Analytics.
- Recognize key performance Indicators tied to any digital marketing plan.
- Improve return on investment for any digital marketing plan
- Launch a new, or evolve an existing, career path in Digital Marketing

Course Outcomes:
On completion of the course, student will be able to–
- Self-Directed Learning: Develop the ability to work independently as well as effectively in the changing environment.
- Usage of Analytical Tools: Develop the ability to apply appropriate quantitative/qualitative techniques used in social science disciplines along with ICT, softwares etc.
- Life Skills: Articulate and apply ethics, values and ideals that demonstrate awareness of current societal challenges leading to better quality of life.

CO No	Course Outcomes (COs)	Bloom's Cognitive Level
CO1	List and describe fundamental concepts, types, and importance of digital marketing.	L1
CO2	Demonstrate the use of SEO, keyword research, and digital tools for online marketing.	L2

CO3	Apply on-page and off-page optimization techniques to improve website visibility.	L3
CO4	Analyze digital marketing metrics, keyword strategies, and campaign effectiveness.	L4
CO5	Evaluate integrated marketing campaigns across social media, email, mobile, and analytics platforms.	L5
CO6	Design and develop a digital marketing plan addressing real-world business challenges.	L6

Course Contents

Unit No.	Title	Lectures
Unit 1	**Basics of digital marketing**	**5 lectures**
	1. Introduction To Online Digital Marketing 2. Importance Of Digital Marketing 3. How did Internet Marketing work? 4. Traditional Vs. Digital Marketing 5. Types of Digital Marketing 6. Increasing Visibility 7. Visitors' Engagement 8. Bringing Targeted Traffic 9. Lead Generation	
Unit 2	**Analysis and keyword research**	**4 lectures**
	1. Market Research 2. Keyword Research And Analysis 3. Types Of Keywords 4. Tools Used For Keyword Research 5. Localized Keyword Research 6. Competitor Website Keyword Analysis 2. • Choosing Right Keywords To The Project	
Unit 3	**Search engine optimization (SEO)**	**3 lectures**
	1. Introduction To Search Engine Optimization 2. How Did Search Engine work? 3. SEO Fundamentals & Concepts 4. Understanding the SERP 5. Google Processing 6. Indexing	

	7. Crawling	
Unit 4	**On-page optimization**	**4 lectures**
	1. Domain Selection 2. Hosting Selection 3. Meta Data Optimization 4. URL Optimization 5. Internal Linking 6. 404 Error Pages 7. H1, H2, H3 Tags Optimization 8. Image Optimization	
Unit 5	**Off-page optimization**	**4 lectures**
	1. Link Building Tips & Techniques 2. Difference Between White Hat And Black Hat SEO 3. Social Bookmarking Submission 4. Search Engine Submission 5. Web 2.0 Submission 6. Article Submission 7. Image Submission 8. Video Submission 9. Forum Submission 10. PPT Submission 11. PDF Submission 12. Classified Submission 13. Business Listing 14. Blog Commenting	
Unit 6	**SEO updates and analysis**	**5 lectures**
	1. Google Panda, • Google Penguin, • Google Penalties • SEO Tools 2. Backlinks Tracking, Monitoring, And Reporting	
Unit 7	**Social media optimization (SMO)**	**5 lectures**
	1. Social Media Optimization 2. Introduction To Social Media Networks 3. Types Of Social Media Websites 4. Social Media Optimization Concepts 5. Facebook, Google+, LinkedIn, YouTube, Pinterest 6. Hashtags 7. Image Optimization	

Reference Books:

1. DIGITAL MARKETING STEP-BY-STEP by Ondrej Svoboda
2. Digital Marketing Growth Hacks: The World's Best Digital Marketers Share Insights on How They Grew Their Businesses with Digital