Faculty of Computer Applications

SYLLABUS FOR

Master of Computer Applications

(Semester I)

(Under Credit Based Continuous Evaluation Grading System)

Session:2025-26

TheHeritageInstitution

KANYAMAHAVIDYALAYAJALANDHAR

(Autonomous)

KANYA MAHA VIDYALAYA JALANDHAR

SCHEME AND CURRICULUM OF EXAMINATION OF TWO-YEAR DEGREE PROGRAMME
PG DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS
MASTER OF COMPUTER APPLICATIONS (MCA)

Course Code	Course Title	Course Type	Credits		Marks				Examination time (in hours)
					Total	Ext.		CA	
			L-T-P	Total		L	P		
MCAL-1121	Design and Analysis of Algorithm	C	4-0-0	4	100	70	-	30	3
MCAL-1122	Web Technologies	C	4-0-0	4	100	70	-	30	3
MCAL-1123	Data Science Foundation	C	4-0-0	4	100	70	-	30	3
MCAL-1124	Probability and Statistical Techniques	C	4-0-0	4	100	70	-	30	3
MCAL-1125 (Opt-II)	Information Security (General Elective)	E	4-0-0	4	100	70	-	30	3
MCAP-1126	Programming Lab based on Web Technologies	C	0-0-2	2	50	-	35	15	3
MCAP-1127	Programming Lab based on Data Science	C	0-0-2	2	50	-	35	15	3
MCAL-1128	*Fundamentals of Computers (Bridge Course)	B	2-0-0	2	50	35	-	15	3
MCAL-1129	*Programming in C (Bridge Course)	B	2-0-0	2	50	35	-	15	3
**Students can opt any one of the following interdisciplinary courses	IDE								
Total				**24**	**700**				
IDEC-1101	Effective Communication Skills								
IDEM-1362	Basics of Music (Vocal)								
IDEI -1313	Human Rights and Constitutional Duties								
IDEW-1275	Indian Heritage: Contribution to the world								
(Credits of these courses will not be added to SGPA/CGPA)**									

*** For students having no mathematics background at 10 +2 or graduation level , compulsory bridge courses have to be qualified . Credits and grade points of these courses will not be included to the SGPA/CGPA of the semester/programme.**

Options for General Elective										
Opt-I	MCAL-1125	Advanced Computer Graphics	E	4-0-0	4	100	70	-	30	3
Opt-II	MCAL-1125	Information Security	E	4-0-0	4	100	70	-	30	3
Opt-III	MCAL-1125	***Skill oriented MOOCS (related to IT/AI/ Computer)	E							

*****Skill Oriented MOOCS courses can be explored on Swayam Portal and other websites offering MOOCS with at least 4 credits, otherwise Dept. will provide a list of available MOOCS Courses.**

Note: Student can opt any of one General Elective Courses.

The Heritage Institution KANYA MAHA VIDYALAYA JALANDHAR
(Autonomous)

Master of Computer Applications
Programme Outcomes

1. Apply knowledge of core computing fundamentals, skills and domain knowledge to solve problems related to real life applications.

2. Select and apply appropriate techniques, resources, and modern computing tools to complex computing activities.

3. Enhance skills to analyze the problem and define logical modeling of solutions.

4. Effectively integrate and utilize contemporary I.T. tools across all computer applications.

5. Create and manage data through relational and non-relation databases using DBMS.

6. Learn latest web technologies and develop dynamic and responsive websites and web applications.

7. Involve in continuous learning and relearning various technical skills and adapt to up-and coming technologies and industry standards.

8. Apply statistical methods, machine learning algorithms and visualization technique for analysis of datasets.

9. Apply project management standards and guidelines for efficient, timely and quality development of software products.

10. Effective communication and presentation of technical information

11. Identify research literature to solve complex computing problems.

12. Show understanding with computing principles and utilize the same as a member, leader and team member in handling projects and working in multidisciplinary settings.

MASTER OF COMPUTER APPLICATIONS (SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)
(Session 2025-26)
COURSE TITLE: DESIGN AND ANALYSIS OF ALGORITHM
COURSE CODE: MCAL-1121

L-T-P: 4-0-0 **Max. Marks: 100**
Credits: 4
Examination Time: 3 Hours **Theory : 70**
CA: 30

Mid Semester Examination: 30% weightage
End Semester Examination: 70% weightage

Course Outcomes: After passing this course, the student will be able to:

CO1: Demonstrate a clear understanding of algorithms and evaluate their performance using appropriate analytical techniques.

CO2: Apply algorithmic strategies to systematically solve computational problems.

CO3: Design and implement solution approaches for problems requiring exploratory or backtracking methods.

CO4: Analyze graph-based problems and recognize computationally complex or intractable challenges.

MASTER OF COMPUTER APPLICATIONS(SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)

(Session 2025-26)
COURSE TITLE: DESIGN AND ANALYSIS OF ALGORITHM
COURSE CODE: MCAL-1121

L-T-P: 4-0-0 **Theory:70**

Examination Time: 3 Hours.

Instructions for Paper Setter -
Eight questions of equal marks (14 Marks each) are to set, two in each of the four sections (A-D). Questions of sub-sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT–I

Introduction to Algorithms: Definition and characteristics of algorithms, analyzing algorithms, importance of algorithm design, asymptotic notations.
Basic Sorting and Searching Algorithms: Bubble sort, insertion sort, selection sort, linear search, binary search.

UNIT–II

Greedy Method: General strategy, fractional knapsack problem, minimum spanning tree – Prim's and Kruskal's algorithms.
Dynamic Programming: General strategy, matrix chain multiplication, 0/1 knapsack problem, Floyd-Warshall all-pairs shortest paths.

UNIT–III

Backtracking: General method, N-Queens problem, sum of subsets, graph coloring, Hamiltonian cycle.
Amortized Analysis: Aggregate, accounting, and potential methods – example of stack operations.

UNIT–IV

Graph Algorithms: BFS and DFS traversal, connected components, topological sort, articulation points.
NP-Completeness: P, NP, NP-Complete.

References/Text Books:

1. Cormen, Leiserson, Rivest, and Stein – *Introduction to Algorithms*, PHI.
2. Horowitz, Sahni, Rajasekaran – *Fundamentals of Computer Algorithms*, Galgotia.
3. Aho, Hopcroft, Ullman – *The Design and Analysis of Computer Algorithms*, Pearson Education.
4. Kleinberg and Tardos – *Algorithm Design*, Pearson.
5. Dasgupta, Papadimitriou, Vazirani – *Algorithms*, McGraw-Hill.

Signature of Course Teacher **Signature of Head of Department**

MASTER OF COMPUTER APPLICATIONS (SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)
(Session 2025-26)
COURSE TITLE: WEB TECHNOLOGIES
COURSE CODE: MCAL-1122

L-T-P: 4-0-0 **Max. Marks: 100**
Credits: 4
Examination Time: 3 Hours **Theory : 70**
CA: 30

Mid Semester Examination: 30% weightage
End Semester Examination: 70% weightage

Course Outcomes: After passing this course, the student will be able to:

CO1: Comprehend the concepts of CSS and JavaScript for developing web pages and describe the Client-Server Architecture.

CO2: Comprehend the concepts of Web Application Frameworks such as Java Servlets, JSP.

CO3: Implement Database connection using JDBC and program the server-side logic using PHP.

CO4: Comprehend middleware and advanced web technologies with case studies.

MASTER OF COMPUTER APPLICATIONS(SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)
(Session 2025-26)
COURSE TITLE: WEB TECHNOLOGIES
COURSE CODE: MCAL-1122

L-T-P:4-0-0 **Theory:70**

Examination Time: 3Hours.

Instructions for Paper Setter -
Eight questions of equal marks (14 Marks each) are to set, two in each of the four sections (A-D). Questions of sub-sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT –I

Web Essentials, Markup languages, CSS Basics of Client side programming, Java script language, java script objects, host objects, Browsers and DOM

UNIT –II

Basics of Server side programming, Java servlets- Life cycle, Servlet API, Reading Servlet parameters, Handling HTTP requests and responses, Cookies and Session Tracking ASP/JSP, Basics of ASP/JSP objects, simple ASP and JSP pages

UNIT –III

Representing Web data, Database connectivity, JDBC, Dynamic web pages, XML, DTD, XML schema, DOM, SAX, XQuery, Building web applications, cookies, sessions, open source environment Introduction to PHP, basics, PHP File handling, file upload, cookies, error handling, PHP MySQL introduction

UNIT –IV

Middleware technologies, Ecommerce architecture and technologies, Ajax, Advanced web technologies and tools. Case Studies: PHP and MySQL case studies.

References/Text Books:

1. Jeffery C Jackson, “Web Technology-A Computer Science Perspective”, Pearson Education
2. Chris Bates, “Web Programming- Building Internet Applications”, Wiley India
3.*Web Technologies: HTML, JavaScript, PHP, Java, JSP, ASP.NET, XML and Ajax, Black Book* by Kogent Learning Solutions Inc.,
4.*Web Technologies: A Developer's Perspective* by N.P. Gopalan and J. Akilandeswari,
5.*Java Server Programming: Java EE6 (J2EE 1.6) Black Book* by Kogent Learning Solutions Inc.,
6.*Beginning PHP and MySQL: From Novice to Professional* by W. Jason Gilmore,
7.*XML: How to Program* by Deitel & Deitel.

Signature of Course Teacher **Signature of Head of Department**

MASTER OF COMPUTER APPLICATIONS (SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)
(Session 2025-26)
COURSE TITLE: DATA SCIENCE FOUNDATION
COURSE CODE: MCAL-1123

L-T-P: 4-0-0 **Max. Marks: 100**
Credits: 4
Examination Time: 3 Hours **Theory : 70**
CA: 30

Mid Semester Examination: 30% weightage
End Semester Examination: 70% weightage

Course Outcomes: After passing this course, the student will be able to:

CO1: Comprehend basics of Python programming like operators, data types, control structures, etc.

CO2: Implement Data Structures for handling and accessing data and implement various functions to solve computing problems.

CO3: Apply concepts of Object Oriented Programming and files and database module in Python to manage, manipulate, clean, and analyze different types of data.

CO4: Apply operations to visualize the dataset using different visualization techniques.

MASTER OF COMPUTER APPLICATIONS(SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)

(Session 2025-26)
COURSE TITLE: DATA SCIENCE FOUNDATION
COURSE CODE: MCAL-1123

L-T-P: 4-0-0 **Theory:70**

Examination Time: 3 Hours

Instructions for Paper Setter -
Eight questions of equal marks (14 Marks each) are to set, two in each of the four sections (A-D). Questions of sub-sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT -I

Introduction to Python: Basic syntax, Literals, Variables and Identifiers, variables, Operators Data types (Numbers, Booleans, Strings), Control Structures (if, if-else, for loop, while loop, break/continue), Nested conditions, String Operations

UNIT -II

Introduction to Data Structures in Python: List, Tuple, Sets, Dictionary, Operations on Data Structures (Declarations, Iterations, Adding/deleting element, min/max/sorting, merge, select).
Functions: Fundamental Concepts, arguments passing, block structure, scope, Program routine, recursion, iteration vs recursion, Lambda function

UNIT -III

Files: Working with Files, File Handling (Read, Write etc.), String Processing, Exception Handling, use of Libraries.
OOPs in Python: Introduction to Object Oriented Programming Classes, Methods, Objects, Functions as objects, multiple inheritance.
Using Databases and SQL: Database Concepts, Using Databases and SQL: Database Concepts, SQLite Manager Firefox Add-on, SQL basic summary, Basic Data modeling, Programming with multiple tables.

UNIT IV

Advance Topics in Python: Working with Numpy, Working with Scipy.
Plotting and Visualization in Python: Plotting using Matplotlib library (Histogram, Box Plot, Scatter Plot, Bar Graphs, Line Graph, etc)
Data Science: Working with Pandas, Working with Scikit-Learn, Basics of Correlation, Regression

Reference/Text Books:

1. Charles Dierbach, Introduction to Computer Science Using Python: A Computational Problem-SolvingFocus, Wiley Publications,
2. Guttag John V, Introduction To Computation And Programming Using Python, PHI, .
3. Jeeva Jose and Sojan P. Lal, Introduction to Computational & Problem Solving Through Python, Khanna Publishers,
4. Mark J. Guzdial, Introduction to Computing and Programming in Python, arson Education
5. Kenneth Lambert, Fundamentals of Python, Course Technology, Cengage Learning,
6. Mark Lutz, Learning Python, O'Reilly Media

Signature of Course Teacher **Signature of Head of Department**

MASTER OF COMPUTER APPLICATIONS (SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)
(Session 2025-26)
COURSE TITLE:PROBABILITY AND STATISTICAL TECHNIQUES
COURSE CODE: MCAL-1124

L-T-P: 4-0-0 **Max. Marks: 100**
Credits: 4
Examination Time: 3 Hours **Theory : 70**
CA: 30

Mid Semester Examination: 30% weightage
End Semester Examination: 70% weightage

Course Outcomes: After passing this course, the student will be able to:

CO1: Comprehend the core principles of probability.
CO2: Understand various probability distributions along with importance of its underlying assumptions and applications.
CO3: Apply various statistical methods related to regression and correlation techniques for data analysis.
CO4: Apply various tests to check for goodness of fit comparing observed data with theoretical distribution.

MASTER OF COMPUTER APPLICATIONS(SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)
(Session 2025-26)
COURSE TITLE:PROBABILITY AND STATISTICAL TECHNIQUES
COURSE CODE: MCAL-1124

L-T-P:4-0-0 **Theory:70**

Examination Time: 3Hours

Instructions for Paper Setter -
Eight questions of equal marks (14 Marks each) are to set, two in each of the four sections (A-D). Questions of sub-sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

.

Unit-I

Basic Statistics: Measures of central tendency, measures of dispersion, range quartile deviation, mean deviation, standard deviation, coefficient of variation, Skewness and Kurtosis, problems.
Statistical Methods: Correlation and Regression –Karl Pearson's coefficient of correlation and rank correlation problems, regression analysis-lines of regression, problems. Curve fitting: curve fitting by the method of least square.

Unit-II

Probability: Introduction, sample space and events, Axioms of probability, Addition and multiplication theorems, conditional probability, Baye's Theorem.
Discrete, continuous and mixed random variables, probability mass, probability density and cumulative distribution functions.

Unit-III

Probability Distributions: Random variables (discrete and continuous), Binomial, Poisson and normal distributions- problems (no derivations for mean and standard deviation)

Unit-IV

Sampling theory: Introduction to sampling distributions, standard error, type-I and type-II errors. Test of hypothesis of means, Neyman-Pearson Fundamental Lemma, tests for one sample and two sample problems for normal populations, tests for proportions.

References/Text Books:

1. An Introduction to Probability and Statistics by V.K. Rohatgi& A.K. Md.E.Saleh.
2. Introduction to Probability and Statistics by J.S. Milton &J.C.Arnold.
3. Introduction to Probability Theory and Statistical Inference by H.J. Larson.
4. Introduction to Statistical Methods by Guptha ,C.B and Vijay Guptha.
5. An Outline of Statistical Theory, Vols. I & II by Goon, A.M., Gupta, M.K. and Das Gupta.
6. Fundamentals of Mathematical Statistics by Gupta and Kapoor .
7. Mathematical Statistics by Kapur, J.N. and Saxena.

Signature of Course Teacher **Signature of Head of Department**

MASTER OF COMPUTER APPLICATIONS (SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)
(Session 2025-26)
COURSE TITLE:INFORMATION SECURITY
COURSE CODE: MCAL-1125

L-T-P: 4-0-0 **Max. Marks: 100**
Credits: 4
Examination Time: 3 Hours **Theory : 70**
CA: 30

Mid Semester Examination: 30% weightage
End Semester Examination: 70% weightage

Course Outcomes: After passing this course, the student will be able to:

CO1: Comprehend essential terminology of cyber security and its importance.

CO2: Identify various Information security threats and measures.

CO3: Comprehend email and web security services.

CO4: Realize the role of Firewalls and IDS in Information security.

MASTER OF COMPUTER APPLICATIONS(SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)
(Session 2025-26)
COURSE TITLE:INFORMATION SECURITY
COURSE CODE: MCAL-1125

L-T-P: 4-0-0 **Theory: 70**
Examination Time: 3 Hours

Instructions for Paper Setter -
Eight questions of equal marks (14 Marks each) are to set, two in each of the four sections (A-D). Questions of sub-sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit-I

Overview of Security: Introduction to Information Security, Principles of Information security, Services and attacks, functional requirements of security. Current trends in security**,** Protection versus security. Aspects of security– confidentiality, authentication, integrity, non-repudiation, availability, Access controls.

Unit-II

Information Security Threats: Virus, Worms, Bots, Adware, Spyware, Ransomware, DoS and DDoS attacks, Trojanhorse, buffer overflow; system threats- intruders; communication threats-tapping and piracy.

Authentication-Types of Authentications - Biometric Authentication and Multi factor authentication.

Information Security Solutions – Encryption -Objectives, types- Symmetric Key Encryption, Asymmetric Key encryption. Data Encryption Algorithms -DES, TDES, RSA, ECC**.**

Unit-III

Integrity-Message Integrity, Message authentication, Hash Functions – MD5, SHA.

Email attacks and Email Security – Threats, Best Practices - PGP, S/MIME, TLS.

Web security Services – Types, Web Application Firewalls, Web filtering, Vulnerability assessment scanners, Fuzzing tools, Black box and white box testing tools.

Unit-IV

Network Security – Firewalls-Introduction, Characteristic, Types: Packet Filter, Stateful and Stateless Packet Filter, Attacks of Packet Filter.

Intrusion detection system - Intruders, Intrusion Detection, Behavior of Authorized user and Intruder, Approaches for Intrusion Detection: Statistical Anomaly Detection and Rule based Detection.

References/Text Books

1. William Stallings, Cryptography and Network Security – Principles and Practice(7th ed.), Pearson Education of India,2017.
2. Adam J.Elbirt, Understanding and Applying Cryptography and Data Security CRC Press, Taylor Francis Group, New York,2015.
3. Charles P.Pfleeger and SLPfleeger, Jonathan Margulies, Security in Computing (6thedition 2023), Addison-Wesley Professional.
4. PeterW. Singer and Allan Friedman, Cybersecurity and Cyberwar: What Everyone Needs to Know, Oxford University Press, 2014.
5. NIIT, Introduction To Information Security Risk Management -Paperback – January 2003,Prentice Hall of India.
6. Hossein Bidgoli, Hand book of information Security, Threats, Vulnerabilities, Prevention, Detection and Management, John Wiley & Sons, 2006.
7. Steve G Watkins, An Introduction to Information Security and ISO27001, IT Governance Publishing, 2013.

Signature of Course Teacher **Signature of Head of Department**

MASTER OF COMPUTER APPLICATIONS(SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)
(Session 2025-26)
COURSE TITLE:PROGRAMMING LAB BASED ON WEB TECHNOLOGEIS
COURSE CODE: MCAP-1126

L-T-P: 0-0-2 **Practical : 35**
Examination Time: 3 Hours

Continuous Assessment: 30% weightage
End Semester Examination: 70% weightage

Practical based on:

Web Technologies: HTML: Basic HTML tags, HTML Forms, HTML tables. CSS: Basic CSS styling, Internal CSS, Linking External CSS, CSS box model, JavaScript: Adding dynamic functionality to HTML page, insert, update and delete HTML elements at runtime, JavaScript Objects, Servlets: Creating a Servlet, handling GET and POST requests with Servlets, extracting parameters from GET and POST requests, JDBC: Connecting to a MySQL database, Create, Read, Update and Delete records using JDBC, PHP: Basics of PHP, Exception handling in PHP, handling file uploads in PHP, AJAX and XML: Making asynchronous requests using AJAX, basics of XML

Signature of Course Teacher **Signature of Head of Department**

MASTER OF COMPUTER APPLICATIONS(SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)
(Session 2025-26)
COURSE TITLE:PROGRAMMING LAB BASED FOUNDATION OF DATA SCIECNE
COURSE CODE: MCAP- 1127

L-T-P: 0-0-2 **Practical : 35**

Examination Time: 3 Hours

Continuous Assessment: 30% weightage
End Semester Examination: 70% weightage

Practical based on:

Develop mini project based on real-world use-cases and implement general problems in Python and programs based on :

String analyzer (count vowels, reverse etc.)
List filtering using conditions
Contact book using dictionaries
Recursive factorial and Fibonacci
Basic calculator with function
Read from a file and process data
Student grade management using classes
Exception-handling

Signature of Course Teacher **Signature of Head of Department**

MASTER OF COMPUTER APPLICATIONS (SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)
(Session 2025-26)
COURSE TITLE:FUNDAMENTALSOF COMPUTERS
COURSE CODE: MCAL-1128

L-T-P: 2-0-0 **Max. Marks: 50**
Credits: 2
Examination Time: 3 Hours **Theory : 35**
CA: 15

Mid Semester Examination: 30% weightage
End Semester Examination: 70% weightage

Course Outcomes: After passing this course, the student will be able to:

CO1: Comprehend about computer hardware, operating system concepts and various system software.

CO2: Identify various input, output and memory devices.

CO3: Apply word processing software to create professional and academic documents.

CO4: Create effective and well-formatted presentation.

MASTER OF COMPUTER APPLICATIONS(SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)

(Session 2025-26)
COURSE TITLE:FUNDAMENTALSOF COMPUTERS
COURSE CODE: MCAL-1128

L-T-P: 2-0-0 **Theory:35**

ExaminationTime:3Hrs.

Instructions for Paper Setter -
Eight questions of equal marks (7 Marks each) are to set, two in each of the four sections (A-D). Questions of sub-sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit-I

FundamentalsofComputer: Introductionto computer,Applicationsofcomputer,Componentsof computers (Input unit, Output Unit, Memory Unit & CPU).

Software: ApplicationSoftware,Servicesoftware,Systemsoftware, bootinga System.

Memories: Primary Memory -RAM (Working and Its types), ROM (Types of ROM). Secondary Memory - Hard Disk (Structure of a hard disk, working, concept of tracks, sectors, clusters, cylinders).

Unit-II

Input Devices: Keyboards, Mouse, Joystick, Light Pen and Data Scanningdevices (scanner, OCR, OMR, MICR, Bar Code Reader, Card Reader)

OutputDevices: Monitor,Printers(laserprinter, dotmatrix printer,inkjetprinter)

Word Processing: IntroductiontoOffice,wordprocessing&itsfeatures,Partsofwindowofword (Title bar, menu bar, status bar, and ruler), understanding the Ribbon, Use of Office Button and Quick Access Toolbar, Creation of new documents, opening document, insert a document into another document.

Unit-III

Word Processing: Pagesetup, margins, gutters, font properties, Alignment, pagebreaks, header & footer,deleting,moving,replace,editingtextindocument,savingadocument,spellchecker, printing a document. Creating a table, entering and editing, Text in tables. Changing format of table, height, width of row/column. Editing, deleting Rows, columns in table. Adding picture, page colors and Watermarks, Borders, shading, Templates, wizards, drawing objects.

Presentation: Introduction to PowerPoint, exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides. Applying theme to presentation, Views (slide View, slide sorter, note's view, outline view), Formatting & enhancing text formatting. Displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds.

Unit-IV

Spreadsheet: Introduction to Worksheet/Spreadsheets, creating a simple Worksheet, Computations in a Worksheet, Printing the Worksheet, Graphs, Data Sorting, Filling, Filtering data, Applying Formulas. Inserting and Editing a Function, Auto Calculate and Manual Calculation, Defining Names, Using and Managing Defined Names, Displaying and Tracing Formulas, Understanding Formula Errors

References/Text Books

1. Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press.
2. V. Rajaraman, Neeharika Adabala, Fundamentals of Computers, PHI Learning,
3. P.K. Sinha, Computer Fundamentals, BPB Publications.
4. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.

Signature of Course Teacher **Signature of Head of Department**

MASTER OF COMPUTER APPLICATIONS (SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)
(Session 2025-26)
COURSE TITLE:INTRODUCTIONTO PROGRAMMING-C
COURSE CODE: MCAL-1129

L-T-P: 2-0-0 **Max. Marks: 50**
Credits: 2
Examination Time: 3 Hours **Theory : 35**
CA: 15

Mid Semester Examination: 30% weightage
End Semester Examination: 70% weightage

Course Outcomes: After passing this course, the student will be able to:

CO1: Comprehend the working of various programming constructs involved in C Programming.
CO2: Design C program and control its sequence using various control statements.
CO3: Apply programming concepts such as arrays, functions and strings to provide solution in different problem domains.
CO4: Work with pointers, structures and union.

MASTER OF COMPUTER APPLICATIONS(SEMESTER – I)
(Two Year Degree Programme) (CBCEGS)

(Session 2025-26)
COURSE TITLE:INTRODUCTIONTO PROGRAMMING- C
COURSE CODE: MCAL-1129

L-T-P: 2-0-0 **Theory: 35**

ExaminationTime:3Hrs.

Instructions for Paper Setter -
Eight questions of equal marks (7 Marks each) are to set, two in each of the four sections (A-D). Questions of sub-sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit-I

Fundamentals: Character set, Identifiers and Keywords, Data types, Constants, Variables, Expressions, Statements, Symbolic Constants.

Operations and Expressions: Arithmetic operators, Unary operators, Relational Operators, Logical Operators, Assignment and Conditional Operators, Library functions. Data Input and Output statements

Unit-II

ControlStatements: Preliminaries,While,do–whileandforstatements,Nestedloops, if–else, Switch, Break – Continue statements.

ProgramStructureStorageClass: StorageClasses-Auto,extern,registerand static.

Unit-III

Functions: Briefoverview,defining,accessingfunctions,passingargumentsto function,specifying argument data types, function prototypes, recursion.

Arrays: Defining,processingan array,passingarraysto afunction,multi–dimensional arrays.

Strings: Stringdeclaration, stringfunctions and stringmanipulation.

Unit-IV

Structures & Unions: Defining and processing a structure, user defined data types, structuresand pointers, passing structures to functions, self-referenced structure, and unions.

Pointers: Fundamentals, pointer declaration, passing pointer to a function, pointer and one-dimensional arrays, operation on pointers, pointers & multi–dimensional arrays of pointers, passing functions

References/Textbooks:

1. E Balagurusamy, Programming in ANSI C, Tata McGraw-Hill, 2002.
2. Byron Gottfried, Schaum's Outline Programming with C, McGraw Hill, 1996.
3. Brian W. Kernighan, Dennis M. Ritchie, The C Programming language, Prentice Hall, 1988.
4. Stephen G. Kochan, Programming in C, Pearson Education, 2015. Note: The latest editions of the books should be followed.

Signature of Course Teacher **Signature of Head of Department**