SURESH GYAN VIHAR
UNIVERSITY

Master of Computer Applications (MCA)

Program Project Report (PPR)
2024-25

Centre for Distance & Online Education (CDOE)

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Program Mission and Objectives

Suresh Gyan Vihar University, Jaipur, established in 2008, is a leading private university of Rajasthan. SGVU, Jaipur is accredited with Grade A+ by National Assessment and Accreditation Council (NAAC), offers courses like Engineering, Management, hotel Management, Pharmacy, Arts, Humanities, Law, Agriculture, B.lib etc. in conventional mode. SGVU is renowned for its innovative academic practices, brilliance in technical education and consultancy to high profile industries. The program's mission is to impart, train and transform a student completely for high caliber competence through latest concepts and technology and equip the students as per the demands of the industry.

The program aims to achieve the following objectives

 i. To provide an opportunity to get an MCA degree to those who find it difficult or even impossible to pursue regular MCA courses at a university either due to their job commitments or certain other circumstances.

 ii. To help the learners, study at their own pace, from their own chosen place.

 iii. To provide students with an in-depth understanding of their chosen field of study, including current theories, research methodologies, and significant developments.

 iv. To develop students' abilities to critically evaluate existing literature, arguments, and evidence within their field.

 v. To encourage the integration of knowledge from various disciplines, promoting a more holistic understanding and innovative approaches to solving complex problems.

 vi. To instill a strong sense of ethical responsibility and an understanding of the ethical implications of research and professional practice within their discipline.

Program Relevance with the University Mission & Goals

Suresh Gyan Vihar University (SGVU) was established with a vision to become a university with commitment to excellence in education, research and innovation aimed towards human advancement.

The proposed program is highly relevant to the SGVU's mission i.e.

- Facilitate holistic education through knowledge sharing, skilling, research, and entrepreneurial development.
- Integrate academic and industrial collaborations towards nation's development.
- Mentor students' physical, mental, emotional, secular, and spiritual attributes to become a valued human resource as it aims to provide quality education to those aspiring

candidates who are deprived of higher education due to the limited number of intakes in the conventional mode of education in the Universities.

Moreover, to keep the quality intact the curriculum and syllabus has been designed at par with the conventional mode keeping in mind the specific needs and acceptability of the learners' ODL mode and in keeping with the aims and objectives of the University also ensures the industry and future skills relevance.

Nature of Prospective Target Group of Learners

The curriculum of MCA is designed in such a way that it helps the students to become not only more employable but also encourages them to become entrepreneurs. Primarily the target group of learners will be:

- Those deprived of admission in the regular mode due to limited intake capacity.
- Those employed in various organizations who desire to pursue higher education as a passion or as a means for movement up the promotional ladder.
- Dropouts primarily due to social, financial and economic compulsions as well as demographic reasons.
- Population of any age and those living in remote areas where higher education institutes are not easily accessible.

Program Appropriateness for conduction in ODL mode

Conducting a Master of Computer Applications (MCA) program in Open and Distance Learning (ODL) mode is highly appropriate and effective for acquiring specific skills and competencies in the field. The degree would be of most value to students which can support the development of critical thinking, research skills, and subject-specific knowledge. In various fields such as education, business, government sector and public administration, it provides professionals with the opportunity to acquire advanced theoretical knowledge and practical skills that are directly applicable to their work environments.

PROGRAMME OUTCOMES (PO)

- **PO 1:** Acquire Computational Knowledge: Develop expertise in computing fundamentals, mathematical techniques, domain-specific knowledge, and computational modeling to address well-defined and emerging challenges in computer applications.

- **PO 2:** Analyze Complex Problems: Investigate, formulate, and evaluate computational solutions for complex problems by integrating mathematical principles, algorithmic strategies, and interdisciplinary knowledge.

- **PO 3:** Design and Engineer Solutions: Architect, implement, and optimize software systems to address real-world challenges in domains such as financial services, healthcare, multimedia, and mass communication.

- **PO 4:** Engage in Continuous Learning: Demonstrate adaptability and commitment to self-directed learning by acquiring advanced skills, staying current with technological trends, and enhancing professional expertise in computer applications.

- **PO 5:** Leverage Modern Tools: Employ, customize, and innovate using advanced software tools, frameworks, and platforms to analyze, model, and solve computing challenges effectively.

- **PO 6:** Adhere to Professional Ethics: Exhibit integrity by adhering to cybersecurity norms, intellectual property regulations, and ethical practices while contributing to socially responsible computing initiatives.

- **PO 7:** Develop Team and Project Management Skills: Apply project management frameworks, agile methodologies, and collaborative tools to lead teams, manage software projects, and deliver solutions in multidisciplinary environments.

- **PO 8:** Communicate Effectively: Articulate technical concepts, design specifications, and research findings clearly and effectively in oral and written formats, catering to both technical and non-technical audiences.

- **PO 9:** Address Societal and Environmental Issues: Identify, assess, and propose sustainable solutions to societal and environmental challenges by leveraging computing technologies and aligning with global and local requirements.

PROGRAMME SPECIFIC OUTCOMES (PSO)

- **PSO 1:** Enumerate technical skills in computer application fields.

- **PSO 2:** Relate the innovative ideas in required real-time applications.

- **PSO 3:** Integrate multi-disciplinary creativity in a modernized organization.

Instructional Design

Curriculum Design

The curriculum is designed by experts in the field of computer science and have considered to include relevant topics that are contemporary and create environmental awareness. It is approved by the BoS (Board of Studies), the CIQA (Centre for Internal Quality Assurance), and the AC (Academic Council) of the University.

Faculty Requirement

Name of Program	Faculty Required	Faculty Available	Name of Faculty	Designation	Date of Joining
MCA	2	2	Dr. Amit Sharma	Associate Professor	31/08/2024
			Dr. Anil Pal	Assistant Professor	17/07/2021

Instructional Delivery:

- Interacting with learning materials (Hard Copy Textbooks)
- Delivery of Learning Materials through SLM
- Personal Mentor Available
- Personal Contact Programme (PCP) conducted at campus on Saturday and Sunday

Master of Computer Applications (Regular & Distance Mode)

Year: I   Semester: AUTUMN/PAVAS

S. No.	Course Code	Course Name	Credits	Contact Hrs/Week			Exam Hrs.	Weightage (in %)	
				L	T/S	P		CIE	ESE
		Program Core							
1	DCA-501	Advance Database Management Concepts using XML	4	4	0	0	3	30	70
2	DCA-551	ADBMS LAB	1	0	0	2	2	30	70
3	DCA-503	Business Communication & Professional Skills	4	4	0	0	3	30	70
4	DCA-505	Software Engineering & UML	4	4	0	0	3	30	70
5	DCA-507	Object Oriented Programming with C++	4	4	0	0	3	30	70
6	DCA-553	Problem Solving & Programming through C++	1	0	0	2	2	30	70
7	DCA-509	Discrete Mathematics & Set Theory	4	4	0	0	3	30	70
		Total	**22**	**20**	**0**	**4**			

Note: In ODL mode the counselling hours will be 12 hours for 4 credit courses.

Year: I   Semester: SPRING/BASANT

S. No.	Course Code	Course Name	Credits	Contact Hrs/Week			Exam Hrs.	Weightage (in %)	
				L	T/S	P		CIE	ESE
		Program Core							
1	DCA-502	Data Communication & Networking	4	4	0	0	3	30	70
2	DCA-506	Data Structure and Algorithm (DSA)	4	4	0	0	3	30	70
3	DCA-552	Advanced-Data Structure & Algorithm Lab	1	0	0	2	2	30	70
4	DCA-504	Data_Mining & Cloud Computing	4	4	0	0	3	30	70
5	DCA-510	Web Development & Designing	4	4	0	0	3	30	70
6	DCA-554	WEB_PRACT	1	0	0	2	2	30	70
7	DCA-508	Operating System Concepts	4	4	0	0	3	30	70
		Total	**22**	**20**	**0**	**4**			

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Year: II   Semester: AUTUMN/PAVAS

S. No.	Course Code	Course Name	Credits	Contact Hrs/Week			Exam Hrs.	Weightage (in %)	
				L	T/S	P		CIE	ESE
		Program Core							
1	DCA-601	Artificial Intelligence and Machine Learning	4	4	0	0	3	30	70
2	DCA-605	Mobile Application Development	4	4	0	0	3	30	70
3	DCA-651	Programming For Mobile Applications Lab	1	0	0	2	2	30	70
4	DCA-603	Cyber Security	4	4	0	0	3	30	70
5	DCA-607	Python Programming	4	4	0	0	3	30	70
6	DCA-653	Python Programming Lab	1	0	0	2	2	30	70
7	DCA-655	Project Training And Seminar	2	0	0	4	2	30	70
		Total	**20**	**16**	**0**	**8**			

Year: II   Semester: SPRING/BASANT

S. No.	Course Code	Course Name	Credits	Contact Hrs/Week			Exam Hrs.	Weightage (in %)	
				L	T/S	P		CIE	ESE
1	DCA-652	Software Development Project	10	0	0	20	3	30	70
2	DCA-654	Application Development Project	10	0	0	20	3	30	70
		Total	**20**	**0**	**0**	**40**			

SYLLABUS

(SEMESTER-I)

Program: Master of Computer Applications

Course Name: Advance Database Management Concepts using XML	Course Code: DCA-501
Semester: 1	Core / Elective:
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of databases, SQL, and data modeling concepts. Familiarity with XML and programming fundamentals.

Course Objectives:

1. To introduce students to advanced database management concepts, focusing on XML and its applications.

2. To teach the integration of XML with relational databases for data storage and retrieval.

3. To explore the concepts of schema design, validation, and querying with XML.

4. To enable students to use XML-related technologies such as XSLT, XPath, and XQuery for data manipulation.

5. To develop practical skills in managing and optimizing XML databases in real-world applications.

Course Content:

Topic and Contents
Block 1: Database Design Theory
Unit 1 Entities & Attributes **Unit 2** Data Models **Unit 3** Normal form
Block 2: Relational Database Management System

Unit 4 Relational Database Design
Unit 5 Relation Query Language
Unit 6 Query Processing and Optimization
Block 3: Distributed and Parallel Database System
Unit 7 Architectures for Parallel Databases
Unit 8 Distributed Database Design
Unit 9 Object-Oriented Concepts
Block 4: The Web and Semi-Structure Data on Database
Unit 10 Web interface and concept of XML
Unit 11 Data Model for XML
Block 5: Enhanced data models for complex Applications
Unit 12 Active and database concepts
Unit 13 Mobile databases,.
Unit 14 Geographic Information Systems (GIS).

Course outcomes:

1. Students will understand advanced database management techniques involving XML.
2. Students will be able to design and manage XML-based database schemas and validate XML documents.
3. Students will demonstrate proficiency in querying and manipulating XML data using XPath and XQuery.
4. Students will integrate XML with relational databases for efficient data storage and retrieval.
5. Students will apply XML-related technologies to real-world database management tasks and optimize database performance.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: ADBMS LAB	Course Code: DCA 551
Semester: 1	Core / Elective: Core
Teaching Scheme in Hrs (L:T:P) :	Credits: 1
Type of course: Lab	Total Contact Hours: 2
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Course Objective:

1. Understand advanced database concepts and techniques.

2. Write and execute complex SQL queries, triggers, and procedures.

3. Explore and use NoSQL databases for unstructured data.

4. Implement database connectivity using programming languages.

5. Learn and apply database security and optimization methods.

Practical 1:
 Accessing the database Use SQL queries to execute the following commands:
1. Create the following Relation (Tables) with primary key integrity constraint:

ID	name	dept_name	salary
10101	Srinivasan	Comp. Sci.	65000
12121	Wu	Finance	90000
15151	Mozart	Music	40000
22222	Einstein	Physics	95000
32343	El Said	History	60000
33456	Gold	Physics	87000
45565	Katz	Comp. Sci.	75000
58583	Califieri	History	62000
76543	Singh	Finance	80000
76766	Crick	Biology	72000
83821	Brandt	Comp. Sci.	92000
98345	Kim	Elec. Eng.	80000

2. Create the following Relation(Tables) Teaches

ID	Course_id	sec id	semester	year
10101	CS-101	1	Fall	2017
10101	CS-315	1	Spring	2018
10101	CS-347	1	Fall	2017
12121	FIN-201	1	Spring	2018
15151	MU-199	1	Spring	2018
22222	PHY-101	1	Fall	2017
32343	HIS-351	1	Spring	2018
45565	CS-101	1	Spring	2018
45565	CS-319	1	Spring	2018
76766	BIO-101	1	Summer	2017
76766	BIO-301	1	Summer	2018
83821	CS-190	1	Spring	2017
83821	CS-190	2	Spring	2017
83821	CS-319	2	Spring	2018
98345	EE-181	1	Spring	2017

3. Insert following additional tuple in instructor ('10211', 'Smith', 'Biology', 66000)
4. Delete this tuple from instructor ('10211', 'Smith', 'Biology', 66000)
5. Select tuples from instructor where dept_name = 'History'
6. Find the Cartesian product instructor x teaches.
7. Find the names of all instructors who have taught some course and the course_id
8. Find the names of all instructors whose name includes the substring "dar".
9. Find the names of all instructors with salary between 90,000 and 100,000 (that is, $\geq$ 90,000 and $\leq$ 100,000)

Practical 2:

Basic SQL
* Order the tuples in the instructors relation as per their salary.
* Find courses that ran in Fall 2017 or in Spring 2018
* Find courses that ran in Fall 2017 and in Spring 2018
* Find courses that ran in Fall 2017 but not in Spring 2018
* Insert following additional tuples in instructor :('10211', 'Smith', 'Biology', 66000), ('10212', 'Tom', 'Biology', NULL)
* Find all instructors whose salary is null.
* Find the average salary of instructors in the Computer Science department.

Practical 3:

Intermediate SQL
* Find the total number of instructors who teach a course in the Spring 2018 semester.
* Find the number of tuples in the teaches relation
* Find the average salary of instructors in each department
* Find the names and average salaries of all departments whose average salary is greater than 42000
* Name all instructors whose name is neither "Mozart" nor Einstein". 6.
* Find names of instructors with salary greater than that of some (at least one) instructor in the Biology department.
* Find the names of all instructors whose salary is greater than the salary of all instructors in the Biology department.
* Find the average instructors' salaries of those departments where the average salary is

greater than 42,000.

COURSE OUTCOMES

1. Apply advanced SQL techniques, including triggers and procedures, to solve complex database problems.

2. Develop and manage NoSQL databases for handling unstructured data.

3. Implement efficient database connectivity in applications using programming languages.

4. Demonstrate the ability to optimize databases for improved performance and scalability.

5. Apply security measures to protect databases from vulnerabilities and unauthorized access.

Note: In ODL mode the counselling hours will be 2 hours for 1 credit course.

Program: Master of Computer Applications

Course Name: Business Communication & Professional Skills	Course Code: DCA-503
Semester: 1	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of communication principles and professional writing.

Course Objectives:

1. To introduce students to the importance and objectives of business communication in the workplace.
2. To enhance students' skills in effective communication and various communication forms.
3. To teach students the art of report writing, creating technical proposals, and drafting business letters.
4. To develop oral presentation, group discussion, and interview techniques, with a focus on business etiquette and soft skills.
5. To explore the impact of technological advancements on communication, including the use of social media, blogs, and emails.

Course Content:

Topic and Contents
Block 1: Business Communication
Unit 1 Importance and Objectives of Business Communication   **Unit 2** Effective communication   **Unit 3** Forms of communication
Block 2: Report writing and Technical Proposals
Unit 4 Types of Reports   **Unit 5** Technical Proposals   **Unit 6** Business Letters

Unit 7 Official Correspondence
Block 3: Interview Methods
Unit 8 Oral Presentations
Unit 9 Group discussion
Unit 10 Business Etiquette & Soft Skills
Unit 11 Interviews Methods and Techniques
Block 4: Body Language
Unit 12 Concept of Body Language
Unit 13 Postures and Interpretation
Block 5: Impact of Technological Advancements on Communication
Unit 14 Internet, Blogs and E-mails communication
Unit 15 Social media (Facebook, Instagram & WhatsApp) Communication

Course outcomes:

1. Students will understand the importance of effective business communication and its objectives.
2. Students will be able to write clear, concise, and professional reports, proposals, and business correspondence.
3. Students will develop strong oral communication skills for presentations, group discussions, and interviews.
4. Students will apply business etiquette and soft skills in professional environments.
5. Students will demonstrate an understanding of how modern technology, including social media and email, has transformed communication practices.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: Software Engineering & UML	Course Code: DCA-505
Semester: 1	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of programming and software development concepts.

Course Objectives:

1. To introduce students to the foundational concepts of software engineering and its processes.
2. To teach the importance of Software Requirement Specifications (SRS) and the requirement engineering process.
3. To provide students with knowledge of software testing strategies and methodologies.
4. To familiarize students with software project management techniques, including cost estimation and maintenance.
5. To develop an understanding of Object-Oriented Design (OOD) and modeling using UML for effective system design.

Course Content:

Topic and Contents
BLOCK-1: Introduction to Software Engineering
Unit–1– Generic view of Process   **Unit–2–** Process Model
BLOCK-2: Software Requirement Specifications (SRS)
Unit –3– Requirement Engineering process   **Unit –4–** Entity Relationship Diagrams   **Unit– 5–** Software Quality Assurance (SQA)
BLOCK-3: Testing Strategies

Unit -6- Fundamental of Testing
Unit -7- System Testing
Unit-8- Structural Testing and Functional Testing
Unit-9- Regression Testing
BLOCK-4: Software Project and Software Maintenance Management
Unit – 10 – Software Cost Estimation
Unit – 11 – COCOMO models
BLOCK-5 : Object Oriented Design & Modeling using UML
Unit – 12– Modeling as Design Technique
Unit – 13– Class Modeling
Unit – 14– Structural Modeling
Unit – 15– Behavioral Modeling
Unit – 16– System Design and Analysis

Course outcomes:

1. Students will understand the software engineering process, including process models and their application.
2. Students will be able to create Software Requirement Specifications (SRS) and work with entity relationship diagrams.
3. Students will demonstrate knowledge of different testing strategies, including functional, structural, and regression testing.
4. Students will gain skills in software project management, including cost estimation and understanding of COCOMO models.
5. Students will be able to apply Object-Oriented Design techniques and UML for effective system design and modeling.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Course Name: Object-oriented programming with C++	Course Code: DCA-507
Semester: 1	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of programming concepts, especially in C++.

Course Objectives:

1. To introduce students to the principles and concepts of object-oriented programming (OOP).
2. To teach the core characteristics of object-oriented programming languages and their applications.
3. To provide hands-on experience with control structures, operators, and expressions in C++.
4. To explore the concepts of classes, objects, constructors, destructors, and operator overloading.
5. To develop an understanding of advanced OOP features such as inheritance, polymorphism, virtual functions, and file handling.

Course Content:

Topic and Contents
Block 1: Principles of Object-Oriented Programming
Unit 1 Object Oriented Programming Paradigm and Concepts **Unit 2** Characteristics of object-oriented languages
Block 2: Control Structures & Expressions
Unit 1 Identifiers and Constants **Unit 2** Data Types & Variables **Unit 3** Operators in C++
Block 3: Classes, Objects & Functions in C++
Unit 1 Function Overloading

Unit 2 Classes and Objects
Unit 3: System Testing and Control
Block 4: Constructors & Destructors, Operator Overloading, Inheritance
Unit 1 Introduction of Constructors & Destructors **Unit 2** Operator Overloading **Unit 3** Inheritance
Block 5: Pointers, Virtual Functions & Polymorphism, Files
Unit 1 Concepts of Pointers **Unit 2** Files **Unit 3** Polymorphism and Virtual Functions
Block 6: An Object-Oriented Approach in Real-Life Problems
Unit 1 Real life example of object-oriented programming

Course Outcomes:

1. Students will understand and apply the object-oriented programming paradigm and its core concepts.

2. Students will demonstrate proficiency in using C++ control structures, data types, operators, and variables.

3. Students will be able to create and manage classes and objects, including function overloading and system testing.

4. Students will implement constructors, destructors, operator overloading, and inheritance in their programs.

5. Students will gain practical experience with pointers, virtual functions, polymorphism, and file handling in C++.

> **Note:** In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: Problem Solving & Programming through C++	Course Code: DCA -553
Semester: 1	Core / Elective: Core
Teaching Scheme in Hrs (L:T:P) :	Credits : 1
Type of course : Lab	Total Contact Hours: 2
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-Requisites:

Proficient knowledge of C++ concepts (OOPs, data types, control structures).

Course Objective:

1. Students will be able to learn about Object-oriented programming.

2. Use Abstract Data Types in the programs.

3. Application of Non-recursive functions.

4. OOP principles like Encapsulation Inheritance Polymorphism were frequently used.

5. Use object-oriented programming (OOP) principles like encapsulation, inheritance, and polymorphism.

Course Content:

S.No.	List of Experiments	Total Contact Hrs.
1	a) Write C++ program to input and output the text message. b) Write C++ program to input and output the text message. c) Write C++ Program to perform all arithmetic operations.	
2	a) Write C ++ Program to utilize the math function. b) Write C ++ Program for Local and Global Variables. c) Write a C++ Program to find the given integer number is even or odd number.	
3	a) Write C++ Program to print biggest number from n numbers. b) Write C++ Program for internal static and external static variables. c) Design programs involving constructors, destructors.	
4	a) Write C++ Program to perform the mathematical expressions. b) Write C++ Program to find the roots of a Quadratic equation. c) Write C++ Programs for all the Operators. (Arithmetical, Logical, Relational, Bitwise).	

5	a) Write C++ Programs to display the different types of patterns using nested for loop. b) Write C++ Program for Statements. (switch, break, goto, continue etc.,).	
6	a) Write a C++ Program to calculate the factorial of a given number. b) Write a C++ Program to swap the two numbers using temp variable and without using temp variable.	
7	a) Mathematical operations on multi dimensional array of elements. b) Reading and Printing a single dimensional array of elements. c) Ascending and descending of an array.	
8	a) Sum of all odd numbers and sum of all even numbers in a single dimensional array. b) C++ Programs on String functions. c) Mathematical operations on single dimensional arrays.	
9	a) C ++ Program to differentiate the parameters and arguments in functions. b) Write a C++ program to calculate string length by writing the user-define function.	
10	a) Call by value and Call by reference programs in functions. b) C++ Program on Opening and closing a file. c) C ++ Program on writing and appending a file on the secondary storage device	

Course Outcomes:

1. Able to differentiate structure-oriented programming and object-oriented programming.

2. Able to understand and apply various object-oriented features.

3. Able to know concepts in operator overloading, function overloading & polymorphism.

4. Able to write, compile and debug programs in C++ language.

5. Able to reuse of code using inheritance.

Note: In ODL mode the counselling hours will be 2 hours for 1 credit course.

Program: Master of Computer Applications

Course Name: Discrete Mathematics & Set Theory	Course Code: DCA-509
Semester: 1	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of mathematics, algebra, and logical reasoning.

Course Objectives:

1. To introduce students to the fundamental concepts of mathematical logic and its applications.
2. To provide an understanding of set theory, including set operations, algebra of sets, and the concept of partially ordered sets.
3. To explore algebraic structures and their applications in linear transformations, module theory, and Boolean algebra.
4. To familiarize students with graph theory concepts, including graphs, Euler and Hamilton paths, and trees.
5. To develop a deeper understanding of relations and functions, focusing on their properties and composition.

Course Content:

Topic and Contents
Block 1: Mathematical Logic
Unit 1 Logical Notation   **Unit 2** Proposition Logic
Block 2: Set Theory
Unit 3 Set Operation   **Unit 4** Algebra of Sets   **Unit 5** Finite and Infinite Sets

Unit 6 Partially Ordered Sets
Block 3: Algebraic Structures
Unit 7 Properties **Unit 8** Algebra of Linear Transformations **Unit 9** Module theory **Unit 10** Polynomial Equation. **Unit 11** Boolean Algebra
Block 4: Graph Theory
Unit 12 Fundamental concepts of graphs **Unit 13** Euler and Hamilton paths **Unit 14** Tree
Block 5: Relations and Functions
Unit 15 Relations and their properties **Unit 16** Composition of functions.

Course outcomes:

1. Students will be able to understand and apply logical notation and propositional logic.
2. Students will demonstrate proficiency in set operations, algebra of sets, and working with finite and infinite sets.
3. Students will apply the concepts of algebraic structures, linear transformations, and Boolean algebra to solve mathematical problems.
4. Students will understand the principles of graph theory and solve problems related to Euler and Hamilton paths and trees.
5. Students will understand the concepts of relations, their properties, and the composition of functions.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

SYLLABUS

(SEMESTER-II)

Program: Master of Computer Applications

Course Name: DATA COMMUNICATION & NETWORKING	Course Code: DCA-502
Semester: 2	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of computer systems, data representation, and basic communication concepts**.**

Course Objectives:

1. To introduce students to the fundamental concepts of computer networks and data communication.

2. To provide an understanding of transmission media, network topologies, and transmission modes.

3. To explore various data communication and switching techniques, including multiplexing and circuit switching.

4. To develop knowledge of wireless communication technologies, error detection, and correction techniques.

5. To familiarize students with network security concepts, including firewalls and encryption/decryption methods.

Course Content:

Topic and Contents
BLOCK-1: Fundamentals of Computer Network
Unit–1–Introduction to Data Communication **Unit–2–**Networking **Unit –3–**Transmission Media **Unit –4–** Network topology **Unit– 5–**Transmission modes
BLOCK-2: Data Communication and Switching Techniques
Unit- 6- Multiplexing **Unit -7-** Circuit Switching **Unit -8-** Packet Switching
BLOCK-3: Wireless Communications, Error Detection& Correction
Unit-9- Error Detection& Correction **Unit-10-** Mobile Generations **Unit -12**- Bluetooth

BLOCK-4: OSI and TCP/IP model
Unit – 13 – OSI Reference Model
Unit – 14 – TCP/IP Model Introduction to Modes of Transfer, Priority Interrupt, DMA, Input-
BLOCK-5: Network Security
Unit – 15– Firewall
Unit – 16– Encryption and Decryption

Course outcomes:

1. Students will understand the principles of data communication, networking, and the different types of transmission media.

2. Students will be able to apply knowledge of network topologies, transmission modes, and switching techniques.

3. Students will demonstrate proficiency in error detection and correction techniques, as well as mobile communication generations.

4. Students will gain an understanding of the OSI and TCP/IP models and their application in real-world networking.

5. Students will be able to implement network security measures, such as firewalls and encryption/decryption, to protect network communications.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: Data Structure and Algorithm (DSA)	Course Code: DCA-506
Semester: 2	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of programming concepts and familiarity with mathematical foundations like logic and functions**.**

Course Objectives:

1. To introduce students to fundamental data structures and abstract data types (ADT) and their applications.
2. To teach basic and advanced algorithms, focusing on sorting, searching, and their applications.
3. To provide an understanding of tree data structures, including binary trees and self-balancing trees.
4. To develop skills in analyzing algorithm complexity and applying different techniques for performance analysis.
5. To explore graph algorithms, focusing on shortest path algorithms, minimum spanning trees, and graph representations.

Course Content:

Topic and Contents
BLOCK-1: Introduction to Data Structure & Algorithm
Unit – 1 – Introduction to Data Structures & Abstract Data Type
Unit – 2 – Introduction to Array ADT & Linked List ADT
Unit – 3 – Stack ADT & Queue ADT
BLOCK-2: Sorting & Searching Algorithm
Unit – 4 – Introduction to Algorithms
Unit – 5 – Basic and Extended Algorithms
Unit – 6 – Search Algorithms
Unit – 7-- Basic Sorting Algorithms
BLOCK-3: Tree Data Structures
Unit – 8 – Binary Tree ADT
Unit – 9 – Self-Balancing Binary Tree ADT
Unit –10 – Trie ADT

BLOCK-4: Analysis of Algorithms
Unit – 11 – Complexity Notations
Unit – 12 – Complexity Analysis Techniques
Unit – 13 – Time Complexity Bound for Searching & Sorting
BLOCK-5: Graph Algorithms
Unit – 14– Adjacency Matrix and Adjacency List
Unit – 15 – Shortest Path Algorithms
Unit – 16 – Minimum Spanning Tree

Course Outcome:

1. Students will understand and apply fundamental data structures such as arrays, linked lists, stacks, and queues.

2. Students will be able to implement and analyze basic and extended sorting and searching algorithms.

3. Students will demonstrate proficiency in working with tree data structures, including binary trees, self-balancing trees, and tries.

4. Students will apply complexity analysis techniques to evaluate and optimize the efficiency of algorithms.

5. Students will be able to implement graph algorithms and understand their application in real-world problems, including shortest path and minimum spanning tree algorithms.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: Advanced Data Structure & Algorithm Lab	Course Code: DCA-552
Semester: 2	Core / Elective: Core
Teaching Scheme in Hrs (L:T:P) :	Credits: 1
Type of course: Lab	Total Contact Hours: 2
Continuous Internal Evaluation:30 Marks	ESE: 70 Marks

Pre-requisites:

Basic programming skills, knowledge of fundamental data structures, understanding of basic algorithms, proficiency in one programming language, and familiarity with algorithm analysis.

Course Objectives:

1. Provide practical experience in implementing advanced data structures and algorithms.

2. Enable students to analyze the performance of algorithms through empirical testing.

3. Enhance problem-solving skills using advanced data structures in coding exercises.

4. Foster teamwork through group projects that involve algorithm design and implementation.

5. Apply learned concepts to solve real-world problems using advanced data structures and algorithms.

Course Content:

S.No.	List of Experiments	Total Contact Hrs.
1	Write a program to implement the following operations on Binary Search Tree: a) Insert b) Delete c) Search d) Display	
2	Write a program to perform a Binary Search for a given set of integer values.	
3	Write a program to implement Splay trees.	
4	Write a program to implement Merge sort for the given list of integer values.	
5	Write a program to implement Quicksort for the given list of integer values	
6	Write a program to find the solution for the knapsack problem using the greedy method.	
7	Write a program to find minimum cost spanning tree using Prim's algorithm	
8	Write a program to implement insertion & deletion in a circular	
9	Write a program to find a single source shortest path for a given graph	
10	Write a program to find the solution for job sequencing with deadlines problems	

Course outcomes:

1. Successfully implement advanced data structures and algorithms in coding assignments.

2. Analyze and evaluate the performance of algorithms through testing and profiling.

3. Demonstrate enhanced problem-solving abilities using advanced data structures

4. Work effectively in teams to develop algorithmic solutions for complex problems.

5. Apply theoretical knowledge of data structures and algorithms to real-world challenges in projects.

Note: In ODL mode the counselling hours will be 2 hours for 1 credit course.

Program: Master of Computer Applications

Course Name: Data Mining & Cloud Computing	Course Code: DCA-504
Semester: 2	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of databases, computing concepts, and data structures.

Course Objectives:

1. To introduce students to the fundamentals of data mining, its functionalities, and preprocessing techniques.

2. To provide an overview of cloud computing, its features, history, and importance in modern computing.

3. To explore predictive and descriptive modeling methods, including classification and clustering techniques.

4. To develop knowledge about cloud models, deployment types, and service models, as well as major cloud computing service providers.

5. To understand the role of data in the cloud, including data storage solutions, database-as-a-service, and the evolution of cloud-based storage services.

Course Content:

Topic and Contents
BLOCK-1: Introduction to Data Mining
Unit – 1 – Introduction to data mining-Data mining functionalities
Unit – 2 – Classification of data mining systems
Unit – 3 – Data-Wrangling and Preprocessing:
BLOCK-2: Introduction to Cloud Computing
Unit – 4 – Introduction to Cloud Computing & History of Cloud Computing
Unit – 5 – Features of Cloud Computing & Importance of Cloud Computing
Unit – 6 – Advantages & Limitations of Cloud Computing,
BLOCK-3: Predicative Modeling & Descriptive Modeling
Unit – 7 – General approach to classification
Unit – 8 – advanced classification methods & Classification by Backpropagation
Unit –9 – Types of data in cluster analysis & Advanced cluster analysis

BLOCK-4: Cloud Models and Types
Unit – 10 – Layers & Types of Cloud
Unit – 11 – Components of Cloud Computing & Cloud Computing Service Providers
Unit – 12 – Introduction of Cloud Model (NIST, Cube, Deployment Models, Service Models)
BLOCK-5: Data in Cloud
Unit – 13– Introduction to Data & Database as a Service
Unit – 14 – Advantages and Limitations of Cloud-Based Storage Solution
Unit –15– Evolution of Network Storage in Cloud & Cloud-Based Data Storage Service Providers

Course outcomes:

1. Students will understand the key concepts of data mining, its functionalities, and data preprocessing techniques.

2. Students will gain an understanding of cloud computing, including its features, advantages, and limitations.

3. Students will apply predictive and descriptive modeling techniques such as classification and cluster analysis to real-world problems.

4. Students will be able to identify and use different cloud models, types, and service providers effectively.

5. Students will demonstrate knowledge of cloud-based data storage solutions, including the advantages, limitations, and evolution of network storage in the cloud.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: Web Development & Designing	Course Code: DCA-510
Semester: 2	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of computers, internet usage, and digital technologies.

Course Objectives:

1. To introduce students to the history of the internet and web design principles.
2. To teach the fundamentals of HTML, including its elements and structure.
3. To provide an understanding of the World Wide Web, web browsers, and internet protocols.
4. To familiarize students with Cascading Style Sheets (CSS) and how they are used for web page styling.
5. To guide students through the process of web publishing, including website creation, structuring, and hosting.

Course Content:

Topic and Contents
BLOCK-1: Basics in Web Design & Web Design Principles
Unit – 1 – Brief History of the Internet & World Wide Web
Unit – 2 – Basic principles involved in developing a website & Five Golden Rules
Unit – 3 – Planning Process & Design Concept.
BLOCK-2: Introduction to HTML & Elements of HTML
Unit – 4 – Introduction to HTML & HTML Elements
Unit – 5 – Mark up Tags, Heading-Paragraphs, Line Breaks, HTML Tags.
Unit –6– Working with Lists, Tables and Frames
BLOCK-3: World Wide Web & The Internet
Unit – 7 – Web browser and its architecture
Unit – 8– Internet Protocols-HTTP, FTP, SMTP protocols.
Unit –9– Security and Privacy issues
BLOCK-4: Introduction to Cascading Style Sheets
Unit – 10 – Introduction to CSS & Concept of CSS

Unit – 11 – CSS Properties & Styling
Unit – 12 – Working with (Block Elements and Objects, Lists and Tables)
BLOCK-5: Introduction to Web Publishing or Hosting
Unit – 13 – Creating & Saving the Web Site
Unit – 14 – web site structure & Tiles for Web Pages
Unit – 15 – Themes-Publishing web sites. CMS & Banks of CMS

Course outcomes:

1. Students will understand the history of the internet and apply web design principles to create effective websites.

2. Students will be able to use HTML elements and tags to structure and organize web content.

3. Students will gain an understanding of web browsers, internet protocols, and how security and privacy issues affect web development.

4. Students will demonstrate the ability to apply CSS properties to style and enhance web pages.

5. Students will be able to create, structure, and publish websites, understanding CMS and other tools used for web hosting.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: WEB_PRACT	Course Code: CA 554
Semester: 2	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 0:0:2	Credits: 1
Type of course: Lab	Total Contact Hours: 20
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-Requisites:

Proficiency in HTML, CSS, and JavaScript. Understanding of basic web development concepts.

Course Objective:

1. To deepen understanding of advanced web technologies and frameworks.
2. To develop skills in building full-stack web applications.
3. To implement responsive design and accessibility best practices.
4. To gain experience with RESTful APIs and web services.
5. To enhance collaborative development and deployment skills using modern tools.

Course Content:

S.No.	List of Experiments	Total Contact Hrs.
1	Build a full-featured online shopping platform	
2	Social Media Dashboard	
3	Develop a web-based chat application using WebSockets	
4	Develop a multi-threaded chat application that allows real-time messaging between users using sockets	
5	Build a blogging platform with user authentication, post creation, and commenting features	
6	Create a web application for managing tasks and projects, including user roles and collaborative features	
7	Build a web application that allows users to share and discover recipes, including features for rating and commenting	
8	Create a fitness tracking application that allows users to log workouts, track progress, and set goals	
9	Develop an LMS that supports course creation, student enrollment, and progress tracking.	
10	Develop a desktop application that reads data from CSV or data	

Course Outcomes:

1. Proficiency in using modern web development frameworks

2. Ability to design and implement full-stack applications with front-end and back-end integration.

3. Understanding of security best practices in web development.

4. Capability to consume and create RESTful APIs for data exchange.

5. Demonstration of effective problem-solving skills through project work and collaboration.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: Operating System Concept	Course Code: DCA-508
Semester: 2	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of computer systems and programming concepts.

Course Objectives:

1. To introduce students to the key concepts of operating systems, including types, process management, and memory management.
2. To provide a deep understanding of the I/O system, including hardware, software, and secondary storage.
3. To teach process scheduling, lifecycle, and various scheduling algorithms used in operating systems.
4. To explore inter-process communication, synchronization techniques, and semaphores.
5. To understand device drivers and system security measures for the protection of resources.

Course Content:

Topic and Contents
BLOCK-1: Introduction to Operating System
Unit–1– Type of Operating System
Unit–2– Process Management
Unit –3– Deadlocks
Unit –4– Memory Management
Unit– 5– File System
BLOCK-2: Input/ Output System
Unit- 6- Principles of I/O Hardware
Unit -7- Principles of I/O Software
Unit -8- Secondary-Storage Structure
BLOCK-3: Processes and Scheduling
Unit-9- CPU Scheduling
Unit-10- Life cycle of a process
Unit -11- Scheduling Algorithms

BLOCK-4: Inter process Communication and synchronization
Unit – 12 – Need for inter-process synchronization
Unit – 13 – Semaphores
BLOCK-5: Device Drivers and Security
Unit – 14– Type of Devices
Unit – 15– Protection of resources

Course outcomes:

1. Students will understand the different types of operating systems and their functionalities in process and memory management.
2. Students will be able to apply the principles of I/O hardware and software in the design and management of storage systems.
3. Students will gain practical knowledge of CPU scheduling, process lifecycle, and how to apply scheduling algorithms.
4. Students will understand the importance of inter-process synchronization and will be able to implement semaphores for process control.
5. Students will develop the skills necessary to manage device drivers and ensure the protection of system resources.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

SYLLABUS

(SEMESTER-III

Program: Master of Computer Applications

Course Name: Artificial Intelligence And Machine Learning	Course Code: DCA-601
Semester: 3	Core / Elective:
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Proficiency in programming (e.g., Python) and strong foundations in mathematics (linear algebra, calculus, probability, and statistics), along with knowledge of data structures, algorithms, and basic database concepts.

Course Objectives:

1. To understand the fundamental principles and techniques of artificial intelligence and machine learning.
2. To explore various machine learning algorithms and their applications in solving real-world problems.
3. To develop skills in designing intelligent systems and building predictive models.
4. To learn to evaluate machine learning models for performance and accuracy.
5. To gain insights into the ethical considerations and societal impacts of AI and ML technologies.

Course Content:

Topic and Contents
BLOCK-1: Introduction To Artificial Intelligence
Unit 1: Introduction To Artificial Intelligence
Unit 2: Problem-Solving Using Search
Unit 3: Uninformed & Informed Search
Unit 4: Predicate and Propositional Logic
BLOCK-2: Representation Of Artificial Intelligence
Unit 5: First Order Predicate Logic
Unit 6: Rule-Based Systems And Other Formalism
Unit 7: Probabilistic Reasoning
Unit 8: Fuzzy And Rough Sets
BLOCK-3: Introduction To Machine Learning
Unit 9: Introduction To Machine Learning Methods
Unit 10: Classification
Unit 11: Regression
BLOCK-4: Concepts Of Machine Learning
Unit 12: Neural Networks And Deep Learning

Unit 13: Feature Selection And Extraction
Unit 14: Association Rules & Clustering
BLOCK-5: Applications and Advanced Topics in AI & ML
Unit 15: Natural Language Processing (NLP)
Unit 16: Reinforcement Learning
Unit 17: Computer Vision

Course outcomes:

1. Students will gain a strong understanding of foundational AI and ML concepts and methodologies.

2. Students will apply problem-solving strategies using search algorithms and logical reasoning techniques.

3. Students will develop and evaluate machine learning models for classification, regression, and clustering tasks.

4. Students will demonstrate proficiency in implementing neural networks and deep learning techniques.

5. Students will utilize AI/ML tools and libraries to solve real-world problems and analyze outcomes effectively.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: Project Training And Seminar	Course Code: DCA-655
Semester: 3	Core / Elective:
Teaching Scheme in Hrs (L: T:P): 0:0:2	Credits: 1
Type of course: Lab	Total Contact Hours :
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic knowledge of programming, databases, and web technologies.

Course Objectives:

1. To introduce students to real-world software development methodologies.
2. To develop skills in full-stack and cross-platform application development.
3. To apply data analysis and machine learning techniques on practical datasets.
4. To design and deploy secure and scalable web, mobile, and IoT applications.
5. To provide hands-on experience in emerging technologies like blockchain and cloud computing

Course Content:

S.No.	List of Experiments	Total Contact Hrs.
1	Build a full-stack web application using MERN (MongoDB, Express.js, React, Node.js).	2 hours weekly
2	Develop a cross-platform mobile app using Flutter or React Native with backend integration.	2 hours weekly
3	Perform data analysis using Python and libraries like Pandas and Matplotlib on a real dataset.	2 hours weekly
4	Train a machine learning model with sci-kit-learn.	2 hours weekly
5	Create a cybersecurity awareness web tool.	2 hours weekly
6	Deploy an app on AWS or Azure.	2 hours weekly
7	Develop a simple Ethereum blockchain application.	2 hours weekly
8	Create and document a RESTful API.	2 hours weekly
9	Build an e-commerce website with payment integration.	2 hours weekly
10	Create an IoT application with sensor data visualization.	2 hours weekly

Course outcomes:

1. Students will be able to build and deploy full-stack and cross-platform applications.

2. Students will perform effective data analysis and visualize results using Python tools.

3. Students will train and evaluate machine learning models using modern libraries.

4. Students will demonstrate the ability to create secure web tools and integrate payment systems.

5. Students will implement and document RESTful APIs and deploy projects on cloud platforms.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: Cyber Security	Course Code: DCA-603
Semester: 3	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of computer networks, operating systems, and programming.

Course Objectives:

1. To introduce students to the fundamental concepts of cyber security.
2. To develop an understanding of various cyber threats and vulnerabilities.
3. To explore methods of protecting systems and networks from security breaches.
4. To examine legal, ethical, and compliance issues in cyber security.
5. To equip students with skills to apply cyber security best practices in real-world scenarios.

Course Content:

Topic and Contents
BLOCK-1: Introduction to Cybersecurity
Unit 1: Introduction to Cybersecurity
Unit 2: Types of Cyber Threats
Unit 3: Attack Vectors and Implications
BLOCK-2: Network Security
Unit 4: Introduction to Network Security
Unit 5: Firewalls, IDS, and IPS
Unit 6: Securing Operating Systems
BLOCK-3: Cryptography
Unit 7: Fundamentals of Encryption and Decryption
Unit 8: Public Key Infrastructure (PKI) and Digital Certificates
Unit 9: Common Web Vulnerabilities and Web Application Security
BLOCK-4: Security Policies and Compliance
Unit 10: Introduction to Security Policies
Unit 11: Compliance Standards and Frameworks
Unit 12: Risk Management and Incident Response

BLOCK-5: Web Security
Unit 13: Introduction to Web Security
Unit 14: Threats and Vulnerabilities in Web Applications
Unit 15: Web Application Firewalls and Protection Mechanisms

Course outcomes:

1. Students will be able to identify and assess different types of cyber threats.

2. Students will understand and implement security measures to protect systems and networks.

3. Students will be able to design and apply security protocols for secure communications.

4. Students will demonstrate knowledge of compliance standards and ethical considerations in cyber security.

5. Students will develop strategies for incident response and threat mitigation.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: Programming for Mobile Applications Lab	Course Code: DCA-651
Semester: 3	Core / Elective: Core
Teaching Scheme in Hrs (L:T:P): 0:0:2	Credits: 1
Type of course: Lab	Total Contact Hours:
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of mobile app development frameworks and programming languages like Dart (for Flutter) or JavaScript (for React Native).

Course Objectives:

1. To familiarize students with mobile application development platforms and tools.
2. To build user-friendly interfaces and interactive features for mobile apps.
3. To develop functional and aesthetically pleasing mobile applications.
4. To integrate backend services for dynamic and data-driven apps.
5. To enhance skills in testing, debugging, and deploying mobile applications.

Course Content:

S. No.	List of Experiments	Total Contact Hrs.
1	Simple calculator App	2 hours weekly
2	Weather Forecast App	2 hours weekly
3	To-Do List App	2 hours weekly
4	Photo Gallery App	2 hours weekly
5	Note-Taking App	2 hours weekly
6	Quiz App	2 hours weekly
7	Social Media Feed	2 hours weekly
8	Fitness Tracker App	2 hours weekly
9	Expense Tracker App	2 hours weekly
10	Recipe Sharing App	2 hours weekly

Course outcomes:

1. Students will design and implement interactive mobile applications.
2. Students will integrate API services to build dynamic and feature-rich apps.

3. Students will demonstrate proficiency in UI/UX design for mobile platforms.

4. Students will effectively use debugging and testing tools to ensure app performance.

5. Students will deploy mobile applications on app stores or test platforms successfully.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: Mobile Application Development	Course Code: DCA-605
Semester: 3	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits:4
Type of course: Lecture + Assignments	Total Contact Hours: 12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of programming languages (JavaScript, Dart) and mobile app development frameworks (React Native, Flutter).

Course Objectives:

1. To introduce students to the fundamentals of mobile application development.
2. To teach students how to design, develop, and deploy mobile applications on various platforms.
3. To enhance skills in creating responsive and user-friendly mobile app interfaces.
4. To integrate backend services and databases for dynamic mobile app functionality.
5. To develop skills in testing, debugging, and optimizing mobile applications.

Course Content:

Topic and Contents
BLOCK-1: Introduction to Android
Unit 1: Introduction to Android
Unit 2: Building Android Applications
Unit 3: Android Manifest and Configuration
BLOCK-2: Android Application Design Essentials
Unit 4: Anatomy of Android Applications
Unit 5: Core Android Components
Unit 6: Android Manifest and Configuration
BLOCK-3: Android User Interface Design Essentials
Unit 7: User Interface Screen Elements
Unit 8: Designing User Interfaces
Unit 9: Working with Animation
BLOCK-4: Testing and Resource Management
Unit 10: Testing and Publishing Android Applications

Unit 11: Using Android Preferences
Unit 12: Working with Different Types of Resources
BLOCK-5: Using Common Android APIs:
Unit 13: Data and Storage Management
Unit 14: Networking and Web APIs
Unit 15: Telephony and Deployment

Course outcomes:

1. Students will be able to develop mobile applications using frameworks like React Native or Flutter.
2. Students will design interactive and functional mobile user interfaces.
3. Students will integrate APIs and backend services to enhance mobile app features.
4. Students will demonstrate proficiency in debugging and testing mobile applications.
5. Students will deploy mobile applications to app stores or other distribution platforms.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: Python Programming	Course Code: DCA-607
Semester: 3	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 3:0:0	Credits: 4
Type of course: Lecture + Assignments	Total Contact Hours:12
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of programming concepts and logic. Familiarity with basic computer operations.

Course Objectives:

1. To introduce students to the fundamental concepts and syntax of Python programming.
2. To teach the use of Python data types, flow control statements, and functions.
3. To provide hands-on experience with pattern matching, regular expressions, and file handling.
4. To explore web scraping techniques and data extraction from websites.
5. To enable students to work with external data, such as Excel spreadsheets, and automate data handling tasks.

Course Content:

Topic and Contents
BLOCK-1: Introduction To Python Basics
Unit 1: Introduction To Basics Python
Unit 2: Data Types
Unit 3: Flow Control Operators / Statements
BLOCK-2: Functions In Python
Unit 4: Introduction To Functions In Python
Unit 5: The Global Statement
Unit 6: The List Data Type
BLOCK-3: Pattern Matching In Python
Unit 7: Pattern Matching With Regular Expressions
Unit 8: Reading And Writing Files
Unit 9: Organizing Files
BLOCK-4: Web Scraping
Unit 10: Web Scraping (Project:Mapit.Py With The Web Browser Module)
Unit 11: Working With Excel Spreadsheet

Unit 12: Updating A Spreadsheet
BLOCK-5: Advanced Python Concepts
Unit 13: Introduction to Object-Oriented Programming in Python
Unit 14: Exception Handling in Python
Unit 15: Working with Python Libraries

Course outcomes:

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

1. Students will be able to write Python programs using basic syntax and data types.
2. Students will be proficient in using flow control statements and functions in Python.
3. Students will demonstrate skills in pattern matching and regular expressions for text processing.
4. Students will be able to perform file I/O operations, organize files, and manage directories.
5. Students will gain practical experience in web scraping and automating data manipulation with Python, including working with Excel spreadsheets.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

Program: Master of Computer Applications

Course Name: Python Programming Lab	Course Code: DCA-653
Semester: 3	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 0:0:2	Credits: 1
Type of course: Lab	Total Contact Hours:
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Basic understanding of programming concepts and logic. Familiarity with basic computer operations.

Course Objectives:

1. Learn the syntax and semantics of Python Programming Language.
2. Write Python functions to facilitate code reuse and manipulate strings.
3. Illustrate the process of structuring the data using lists, tuples and dictionaries.
4. Demonstrate the use of built-in functions to navigate the file system.
5. Appraise the need for working on web scraping

Course Content:

S. No.	List of Experiments
1	Write a Python script to print "Hello, World!" and perform basic arithmetic operations.
2	Create a function that takes a string as input and returns it reversed.
3	Write a Python program to create a list of numbers and find the maximum value.
4	Create a tuple with mixed data types and access elements by index.
5	Implement a dictionary to store student grades and fetch a grade by student name.
6	Write a Python program to create, write to, and read from a text file.
7	Create a script that lists all files in a given directory using built-in functions.
8	Extract the titles of articles from a sample HTML page using the BeautifulSoup library.
9	Scrape live weather data from a website and display the current temperature (ensure ethical use and permissions).
10	Develop a reusable Python function to calculate the factorial of a number.

Course outcomes:

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

1. Students will be able to write Python programs using basic syntax and data types.
2. Students will be proficient in using flow control statements and functions in Python.
3. Students will demonstrate skills in pattern matching and regular expressions for text processing.
4. Students will be able to perform file I/O operations, organize files, and manage directories.
5. Students will gain practical experience in web scraping and automating data manipulation with Python, including working with Excel spreadsheets.

Note: In ODL mode the counselling hours will be 12 hours for 4 credit course.

SYLLABUS
(SEMESTER-IV)

Program: Master of Computer Applications

Course Name: Software Development Project	Course Code: DCA-652
Semester: 4	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 0:0:0	Credits: 10
Type of course: Project	Total Contact Hours: 3
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Domain Specific Knowledge.

Course Objectives:

To provide industry exposure to the student, 6 months of training in a reputed software industry is mandatory for every student in the 4th Semester.

Course Content:

Units	Course Contents	Total Contact Hrs.
1	Training as per the industrial requirements.	18 hrs week

Course outcomes:

Successful completion of this course makes students more employable, skilled and equipped with more knowledge.

Program: Master of Computer Applications

Course Name: Application Development Project	Course Code: DCA-654
Semester: 4	Core / Elective: Core
Teaching Scheme in Hrs (L: T:P): 0:0:0	Credits: 10
Type of course: Project	Total Contact Hours: 3
Continuous Internal Evaluation: 30 Marks	ESE: 70 Marks

Pre-requisites:

Domain Specific Knowledge.

Course Objectives:

To provide industry exposure to the student, 6 months of training in a reputed software industry is mandatory for every student in the 4th Semester.

Course Content:

Units	Course Contents	Total Contact Hrs.
1	Training as per the industrial requirements.	18 hrs week

Course outcomes:

Successful completion of this course makes students more employable, skilled and equipped with more knowledge.

Note: In ODL mode the counselling hours will be 3 hours for 10 credit course.

Procedure for Admission, Curriculum Transaction and Evaluation

The proposed program in ODL mode will be conducted by CDOE-SGVU with the support of various departments of the University. Eligibility criteria, course structure, detailed curriculum, duration of program and evaluation criteria shall be approved by Board of Studies and Academic Council, SGVU, Jaipur which are based on UGC guidelines for the program which comes under the purview of ODL and mode for award of Degree. Details of Procedure for admission in which eligibility criteria for admission and fee structure of the course, Curriculum includes Program delivery, norms for delivery of courses in ODL mode, use of IT services to academic support services, course design academic calendar and Evaluation which includes Distribution of Marks in Continuous internal assessments, Minimum Passing criteria and system of Grading formats are given in detail as under.

Procedure for Admission

Students who will seek admission in MCA (Master of Computer Applications) program to apply through its website www.sgvu.edu.in.

Minimum Eligibility Criteria for Admission

The minimum eligibility criteria for admission in ODL MCA (Master of Computer Applications) program is a pass in graduation with Mathematics / Computer Application as one subject.

Program Fee and Financial Assistance Policy

Program fees for students for the proposed MCA in various streams offered by CDOE-SGVU Jaipur is Rs. 52,000 per year tuition fees and Rs. 3000 per year examination fees.

Program Delivery

The curriculum will be delivered through the Self Learning Materials (SLMs) supported by various learning resources including audio-video aids.

Academic Calendar

S. No.	Name of the Activity	Tentative months schedule during year			
		From (Month)	To (Month)	From (Month)	To (Month)
1	Admission	Jul	Sep	Jan	Feb
2	Assignment Submission (if any)	Oct	Nov	April	May
3	Evaluation of Assignment	Nov	Dec	May	June
4	Examination	Dec	Jan	June	Jul
5	Declaration of Result	Feb	Mar	Aug	Sep
6	Re–registration	Jan	Feb	Jul	Sep
7	Distribution of SLM	Jul	Sep	Jan	Feb
8	Contact Program, Counselling, Practical, etc.)	Nov	Dec	May	June

Evaluation

The evaluation shall include two types of assessments-

1. Continuous Assessment in the form of assignments (30% Weightage).

2. End Semester Examination, which will be held at the SGVU campus (70% Weightage).

Minimum Passing percentage

The marks of both the components (continuous assessment & end semester exam evaluation) of a course shall be added to get total marks out of 100. Minimum passing marks in end semester examinations/overall in each course shall be as follows:

•   For UG program:

End semester examination: 30%, Total Marks: 37%

•   For PG program:

End semester examination: 40%, Total Marks: 46%

Marks and Grades

Grades & Grade Points

a. At the end of the Semester / Year every student is assigned a 'Letter Grade' based on his/her performance over the semester in all courses for which he/she had registered.

b. The letter grade and grade point indicate the results of quantitative and qualitative

assessment of the student's performance in a course.

c. There are seven letter grades: S, A+, A, B+, B, C, D, F that have grade points with values distributed on a 10-point scale.

Requirement of the Laboratory Support and Library Resources

Laboratory Resources

The university has the state-of-the-art computer labs and the associated peripherals to support any number of students at a given point of time, the students can learn and carry out in length research activities at the computer labs in the SGVU, Campus.

Library Resources

CDOE-SGVU has an excellent library with all the books required for the course learning and reference books for the course of MCA adequate online learning links and e-learning materials will also be provided to students which will support students in their learning cycle.

Cost Estimate of the Program and the Provisions

The Estimate of approximate Cost & Budget could be as follows (all figures on Annual basis):

1. Salaries: Rs. 60,00,000/- (Approx).
2. Travel: Rs. 30,000/- (Approx).
3. Seminars: Rs. 2,00,000/- (Approx).
4. SLM Preparation, Printing, Distribution: Rs. 3,00,000/- (Approx).
5. Library & e-resources (including membership like DELNET): 3,50,000/- (Approx).
6. Courier/Transportation: Rs. 50,000/- (Approx).
7. Infrastructure: Rs. 5,00,000/- (Approx)
8. Computer Labs & Leased Line: Rs. 1,00,000/- (Approx)
9. E-contents development: 8,00,000 (Approx)
10. LMS & its Maintenance (including server): 2,00,000 (Approx.)

Quality Assurance Mechanism and Expected Program Outcomes

- The quality of the program depends on the course curriculum and syllabus which meets the requirement of the industry and creates the skillful learning in the students. The ultimate aim of BCA (Bachelor of Computer Applications) program in ODL Mode is to enhance skill soft he learners as managers, entrepreneurs and seeing them excel in their profession and meeting global standards too by upgrading their career opportunities.

- The CDOE, SGVU, Jaipur has constituted the Centre for Internal Quality Assurance

(CIQA). The CIQA will do periodic assessment of the online learning course material and audio video tutorials to ensure quality of learning and time to time changes are made as per the course requirement.

- The CIQA will also assess the quality of assignments, quizzes and end term assessment from time to time and required changes will be assured. CIQA will assure that the learning is made a truly global experience for the learner along with inculcation of required skills in the learner as expected program outcome with CDOE, SGVU, Jaipur.

- The university will work continuously for the betterment of processes, assessments, teaching methodology, e-learning material improvisation as per four quadrant approach and implementation of the same as per New Education Policy. The University is committed to deliver the best education in all the learning modes with adherence to NEP, UGC and other regulatory guidelines in a truly global sense.