Course Outline for MCA 1ˢᵗ & 2ⁿᵈ Sem (2024-25 session)

SINGHANIA UNIVERSITY

(UGC- Recognized University as per section 2(f) of the UGC act 1956)

<u>Course Outline</u>

COURSE TITLE	Data structures and Algorithms
Course Code	MCA C-101
Credits	4 (L: 3 ,P:1 ,T:4)
Faculty Name	Dr. Monika
Program	MCA
Academic Year and Semester	w.e.f. 2024-25, 1ˢᵗ Semester

1. Course Description

Different data structures will be studied and make them use effectively for solving problems.

2. Student Learning Outcomes:

At the end of this course, students should be able to:
Course Learning Outcomes (CLO):

At the end of course student will be able to:
1. Check the correctness of algorithms using inductive proofs and loop invariants.
2. Compare functions using asymptotic analysis and describe the relative merits of worst-, average-, and best-case analysis.
3. Solve recurrences using the master, the iteration, and the substitution method.
4: Become familiar with a variety of algorithms.
5. Understand and identify the performance characteristics of fundamental algorithms and data structures.
6. Use the design techniques introduced.

3. Required Textbook and Reference Material:

● Material will be provided by faculty.

4. Session Plan:

Session plan will be provided by faculty members according to the syllabus.

5. Evaluation:

COMPONENT	WEIGHTAGE	DETAILS
Assignment	10%	Sheet Work(A-4 Size sheet in a well mannered way)
Tests	10%	Test would be taken to assess the knowledge about topics related to daily basis classes.
Attendance & Classroom participation	10%	Students should have at least 75% attendance
Mid -Sem Exam	20%	Mid- Term exam must be cleared by students for appearing in final examination.
End -Sem Exam	50%	The end term exam must be cleared for appearing in next semester with a minimum passing criteria .

6. Academic Integrity:

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SINGHANIA UNIVERSITY

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Course Outline

COURSE TITLE	Discrete Mathematics
Course Code	MCA C 102
Credits	4 (L: 3 ,P:1 ,T:4)
Faculty Name	Dr. Monika
Program	Discrete Mathematics
Academic Year and Semester	w.e.f. 2024-25, 1st Semester

1. Course Description

Provide a survey of Discrete Mathematics, the study of finite systems, needed in computer science.

2. Student Learning Outcomes:

At the end of this course, students should be able to:
At the end of course student will be able to:
1. Use logical notation to define and reason mathematically about the fundamental data types and structures use in computer algorithms and systems.
2. Compare and Evaluate rigor in the definitions and conclusions about mathematical models and identify fallacious reasoning and statements. Identify and Apply properties of combinatorial structures and properties - know the basic techniques in combinatorics and counting.
3. Analyze sets with operations, and identify their structure. Reason and Conclude properties about the structure based on the observations.
4. Gain the conceptual background needed to be able to identify structures of algebraic nature, and discover, prove and use properties about them.

3. Required Textbook and Reference Material:

● Material will be provided by faculty.

4. Session Plan:
Session plan will be provided by faculty members according to the syllabus.

5. Evaluation:

COMPONENT	WEIGHTAGE	DETAILS
Assignment	10%	Sheet Work(A-4 Size sheet in a well mannered way)
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SINGHANIA UNIVERSITY

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Course Outline

COURSE TITLE	Computer Architecture
Course Code	MCA C 103
Credits	4 (L: 3 ,P:1 ,T:4)
Faculty Name	Dr. Monika
Program	MCA
Academic Year and Semester	w.e.f. 2024-25, 1st Semester

1. Course Description

Course main aims to describe a broad range of architectural designs and to contrast them, highlighting the design decisions they incorporate, and how these designs impact program performance.

2. Student Learning Outcomes:

At the end of this course, students should be able to:

At the end of course student will be able to:

1. Understand the major architectural styles and appreciate the compromises that they encapsulate.

2. Read outline descriptions of real processors and understand in which way their designs fit into the frameworks described in the course.

3. Understand the impact of design choices in programming in the context of a specific architecture.

3. Required Textbook and Reference Material:

- Material will be provided by faculty.

4. Session Plan:

Session plan will be provided by faculty members according to the syllabus.

5. Evaluation:

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Assignment	10%	Sheet Work(A-4 Size sheet in a well mannered way)
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Course Outline

COURSE TITLE	Computer programming with C
Course Code	MCA C 104
Credits	4 (L: 3 ,P:1 ,T:4)
Faculty Name	Dr. Monika
Program	MCA
Academic Year and Semester	w.e.f. 2024-25, 1st Semester

2. Course Description

To introduce to the students, programming basics and the fundamentals of C.

3. Student Learning Outcomes:

1. Understanding the concept of input and output devices of Computers
2. Learn the functional units and classify types of computers, how they process information and how individual computers interact with other computing systems and devices.
3. Understand an operating system and its working, and solve common problems related to operating systems
4. Learn basic word processing, Spreadsheet and Presentation Graphics Software skills.
5. Study to use the Internet safely, legally, and responsibly

4. Required Textbook and Reference Material:

● Material will be provided by faculty.

4. Session Plan:

Session plan will be provided by faculty members according to the syllabus.

5. Evaluation:

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Assignment	10%	Sheet Work(A-4 Size sheet in a well mannered way)
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Course Outline

COURSE TITLE	Computer Programming lab
Course Code	MCA C 105
Credits	4 (L: 3 ,P:1 ,T:4)
Faculty Name	Dr. Monika
Program	MCA
Academic Year and Semester	w.e.f. 2024-25, 1st Semester

1. **Course Description**

   Computer Programming lab is a hands-on project and assignment-based learning space where students will gain strong practical and technical skills in various programming including C.

2. Student Learning Outcomes:

At the end of course student can:
 1. Understand the logic for a given problem.
 2. Recognize and understand the syntax and construction of C programming code.
 3. Gain experience of procedural language programming.
 4. Learn the methods of iteration or looping and branching.
 5. Understand how to access and use library functions.
 6. Understand function declaration and definition.
 7. Understand proper use of user defined functions.
 8. Write programs to print output on the screen as well as in the files.
 9. Apply all the concepts that have been covered in the theory course, and
 10. Know the alternative ways of providing solution to a given problem.

3. **Required Textbook and Reference Material:**

   ● Material will be provided by faculty.

4. Session Plan:

Session plan will be provided by faculty members according to the syllabus.

5. Evaluation:

COMPONENT	WEIGHTAGE	DETAILS
Assignment	10%	Sheet Work(A-4 Size sheet in a well mannered way)
Tests	10%	Test would be taken to assess the knowledge about topics related to daily basis classes.
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Course Outline

COURSE TITLE	Data Structure Lab
Course Code	MCA C 106
Credits	4 (L: 3 ,P:1 ,T:4)
Faculty Name	Dr. Monika
Program	MCA
Academic Year and Semester	w.e.f. 2024-25, 1st Semester

2. Course Description

It strengthen the ability to the students to identify and apply the suitable data structure for the given real world problem.

2. Student Learning Outcomes:

At the end of course student will be able to:
1. Identify the appropriate data structure for given problem.
2. Design programs for solving problems using different data structures.
3. Solve problems using trees, graphs and hash tables addressing various issues.

3.   Required Textbook and Reference Material:

- Material will be provided by faculty.

4. Session Plan:
Session plan will be provided by faculty members according to the syllabus.

5. Evaluation:

COMPONENT	WEIGHTAGE	DETAILS
Assignment	10%	Sheet Work(A-4 Size sheet in a well mannered way)
Tests	10%	Test would be taken to assess the knowledge about topics related to daily basis classes.
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Course Outline

COURSE TITLE	Object oriented Programming using C++
Course Code	MCA C201
Credits	4 (L: 3 ,P:1 ,T:4)
Faculty Name	Dr. Monika
Program	MCA
Academic Year and Semester	w.e.f. 2024-25, 2nd Semester

1. Course Description

This course is designed to gain the necessary skills and knowledge to design and develop software systems using object-oriented programming techniques in C++.

2. Student Learning Outcomes:

Course Learning Outcomes (CLO):

At the end of course student will be able to:
1. Apply object oriented programming features and concepts for solving given problem.
2. Develop programs with reusability.
3. Implement relationships between classes and demonstrate various collection classes.
4. Develop programs for file handling.
5. Develop applications for a range of problems using object-oriented programming techniques.

3.   Required Textbook and Reference Material:

- Material will be provided by faculty.

4. Session Plan:

Session plan will be provided by faculty members according to the syllabus.

5. Evaluation:

COMPONENT	WEIGHTAGE	DETAILS
Assignment	10%	Sheet Work(A-4 Size sheet in a well mannered way)
Tests	10%	Test would be taken to assess the knowledge about topics related to daily basis classes.
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Course Outline

COURSE TITLE	Operating system
Course Code	MCA C202
Credits	4 (L: 3 ,P:1 ,T:4)
Faculty Name	Dr. Monika
Program	MCA
Academic Year and Semester	w.e.f. 2024-25, 2nd Semester

2. Course Description

This course teaches basic operating system abstractions, mechanisms, and their implementations.

2. Student Learning Outcomes:

At the end of the course students will be able to:
1. Learn how Operating System is Important for Computer System.
2. Outline various concepts and features of Operating systems.
3. Compare various operating systems with respect to characteristics and features
4. Implement algorithm of CPU Scheduling, Memory Scheduling and disk scheduling
5. Make changes in the OS configurations as per need.

3. Required Textbook and Reference Material:

● Material will be provided by faculty.

4. Session Plan:
Session plan will be provided by faculty members according to the syllabus.

5. Evaluation:

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Assignment	10%	Sheet Work(A-4 Size sheet in a well mannered way)
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SINGHANIA UNIVERSITY

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Course Outline

COURSE TITLE	Data base management system
Course Code	MCA C 203
Credits	4 (L: 3 ,P:1 ,T:4)
Faculty Name	Dr. Monika
Program	MCA
Academic Year and Semester	w.e.f. 2024-25, 2nd Semester

1. Course Description

This course is specifically designed to ensure that you get all the important concepts and tricks related to the Database Management System.

2. Student Learning Outcomes:

Upon successful completion of the course, the student will be able to:
1. Understand the basic concepts of database management systems.
2. Apply SQL to find solutions to a broad range of queries.
3. Apply normalization techniques to improve database design.
4. Analyze a given database application scenario to use ER model for conceptual design of the database

3. Required Textbook and Reference Material:

● Material will be provided by faculty.

4. Session Plan:

Session plan will be provided by faculty members according to the syllabus.

5. Evaluation:

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Assignment	10%	Sheet Work(A-4 Size sheet in a well mannered way)
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Course Outline

COURSE TITLE	Computer Network
Course Code	MCA C204
Credits	4 (L: 3 ,P:1 ,T:4)
Faculty Name	Dr. Monika
Program	MCA
Academic Year and Semester	w.e.f. 2024-25, 2nd Semester

1. Course Description

This course provides a robust understanding of networking. It teaches the fundamentals of networking systems, their architecture, function and operation.

2. Student Learning Outcomes:

At the end of this course, Students should be able to:
At the end of the course students will able to:
1. Explain basic concepts, OSI reference model, services and role of each layer of OSI model and
T transmission.
2. Apply channel allocation, framing, error and flow control techniques.
3. Describe the functions of Network Layer.
4. Explain the different Transport Layer function i.e. Port addressing, Connection Management, Error control and Flow control mechanism.
5. Explain the functions offered by session and presentation layer and their Implementation.
6. Explain the different protocols used at application layer i.e. HTTP, SNMP, SMTP, FTP, TELNET and VPN.CP/IP, networks devices and transmission media, analog and digital data

3.   Required Textbook and Reference Material:

- Material will be provided by faculty.

4. Session Plan:

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5. Evaluation:

COMPONENT	WEIGHTAGE	DETAILS
Assignment	10%	Sheet Work(A-4 Size sheet in a well mannered way)
Tests	10%	Test would be taken to assess the knowledge about topics related to daily basis classes.
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Course Outline

COURSE TITLE	OOPS LAB
Course Code	MCA C 205
Credits	4 (L: 3 ,P:1 ,T:4)
Faculty Name	Dr. Monika
Program	MCA
Academic Year and Semester	w.e.f. 2024-25, 2nd Semester

1. Course Description

This lab purpose is to enhance the programming skills of the students by giving practical assignments and also requisite knowledge about Object Oriented Programming through C++ so that they make their own Applications/Projects using C++.

2. Student Learning Outcomes:

At the end of the course students can:
1. Demonstrate class object concepts by using C++.
2. Develop programs using inheritance and polymorphism.
3. Demonstrate the significance of constructors and destructor.
4. Implement function and operator overloading using C++.
5. Construct generic classes using template concepts.
6. Implement the concept of file handling.

3. Required Textbook and Reference Material:

● Material will be provided by faculty.

4. Session Plan:
Session plan will be provided by faculty members according to the syllabus.

5. Evaluation:

COMPONENT	WEIGHTAGE	DETAILS
Assignment	10%	Sheet Work(A-4 Size sheet in a well mannered way)
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Course Outline

COURSE TITLE	DBMS LAB
Course Code	MCA C 206
Credits	4 (L: 3 ,P:1 ,T:4)
Faculty Name	Dr. Monika
Program	MCA
Academic Year and Semester	w.e.f. 2024-25, 2nd Semester

2. Course Description

The objective of this lab course is to understand the practical applicability of database management system concepts.

2. Student Learning Outcomes:

At the end of the course students can:
1. Design a database schema for a given problem domain.
2. Use the basics of SQL and construct queries using SQL in database creation and interaction.
3. Use of various software to designs and build ER diagrams, UML, Flowchart for related database systems.
4. Design and implement database applications on their own.

3.   Required Textbook and Reference Material:

● Material will be provided by faculty.

4. Session Plan:
Session plan will be provided by faculty members according to the syllabus.

5. Evaluation:

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6. Academic Integrity:

● Please note that students involved in academic dishonesty will receive a **ZERO** grade on the particular component in which the infraction occurred.

● Academic dishonesty consists of misrepresentation by deception or by other fraudulent means. In an academic setting this may take the form of copying or use of unauthorized aids in tests, assignments, examinations, term papers, or cases; plagiarism; talking during in-class examinations; submission of work that is not your own without citation; submission of work generated by another person; aiding and abetting another student's dishonesty; and giving false information for the purpose of gaining credits.

7. No Network Policy

Students cannot operate any network enabled devices such as cell phones, e- tabs, I - pads or any other electronic network enabled devices inside the classroom during the sessions unless specifically instructed by the faculty. In case you are compelled to carry it in person, you may keep it in the switched off mode. Anyone found to operate such devices during the session timings will be penalized as per the rules. No discussion or negotiation will be entertained at all with respect to this.