

**Punyashlok Ahilyadevi Holkar Solapur University,
Solapur**



Name of the Faculty : Science and Technology

CHOICE BASED CREDIT SYSTEM

Syllabus

Name of the Course: **MCA – II (Sem. III and IV)**
(Two Year)

(Syllabus to be implemented from June. 2024)

MASTER OF COMPUTER APPLICATIONS
(SCIENCE & TECHNOLOGY FACULTY)
DETAIL SYLLABUS OF MCA-II SEMESTERS III AND IV

1. Program Outcomes :

- Students are able to take up positions as systems analysts, systems designers, programmers and managers in any field related to information technology.
- Students are able to apply knowledge of Mathematical Foundations in computing problems.
- Students pass on their knowledge for planning, designing and building complex Application Software Systems as well as provide support to automated systems or application.
- Produce entrepreneurs who can develop customized software solutions for small to large Enterprises.
- Students are able to function as an effective communicator and team member through essential skills in multidisciplinary projects.

- 2. COURSE STRUCTURE:** The MCA course is a FOUR semester course. The teaching for the semesters I and III will be during the first half of the academic year and for the semesters II and IV will be during the second half the academic year.

A Four Semester M.C.A. Course

Semester	No. of Papers / Practical / Project	Marks	Credits
Semester - I			
• Theory Papers	06	600	24
• Practical Papers	02	100	04
• Mini Project	01	50	02
Semester - II			
• Theory Papers	06	600	24
• Practical Papers	02	100	04
• Mini Project	01	50	02
Semester - III			
• Theory Papers	06	600	24
• Practical Papers	02	100	04
• Mini Project	01	50	02
Semester - IV			
• Major Project	01	250	10
Total marks and credits		2500	100

Bridge Course for B.Sc. / B.Com. / B.A. students

Semester	No. of Papers / Practical	Marks	Credits
Semester - I			
• Theory : Programming using C	01	50	02
• Practical : Programming using C	01	50	02

MCA – II Semester III and IV: Structure of the Syllabus

M. C. A. Part – II Semester – III						
Paper Code	Title of the Paper	Contact hrs./week	Distribution of Marks for Exam.			Credits
			Internal	University	Total	
	Hard Core – Theory					
HCT3.1	•NET Technology	04	20	80	100	04
HCT3.2	Digital Image Processing	04	20	80	100	04
HCT 3.3	Mobile Computing	04	20	80	100	04
HCT 3.4	Artificial Intelligence	04	20	80	100	04
Soft Core - Theory (Any One Group)						
SCT 3.1	Data Warehouse and Mining	04	20	80	100	04
SCT 3.2	Finite Automata					
Open Elective (Any One)						
OET 3.1	Open-Source Technologies (PHP, MySql)	04	20	80	100	04
OET 3.2	SWAYAM course *					
Hard Core –Practical						
HCP 3.1	Practical-I based on HCT 3.1, HCT3.2 and HCT3.3	08	10	40	50	02
HCP 3.2	Mini Project –III	02	10	40	50	02
Open Elective - Practical (Any One)						
OEP 3.1	Practical Based on OET 3.1	02	10	40	50	02
OEP 3.2	Practical / Seminar / Viva based on SWAYAM course OET3.2					
Total		36	150	600	750	30
M. C. A. Part – II Semester – IV						
Paper Code	Title of the Paper	Contact hrs./week	Distribution of Marks for Exam.			Credits
			Internal	University	Total	
Hard Core –Practical						
HCP 4.1	Project – IV (Major Project)	02	50	200	250	10
Total		02	50	200	250	10

*: The credits will be transferred as per university policy and UGC guidelines after submitting the completion certificate / mark list from the SWAYAM.

3. Nature of theory question paper

<p>M. C. A. ____ Sem. ____</p> <p>Paper Name _____</p>	
Time : 3 hrs	Marks : 80
<p>Instructions :</p> <p>1. Question No. 1 and 2 are compulsory</p> <p>2. Attempt any 3 questions from Q. No. 3 to Q. No. 7</p> <p>3. Figures to the right indicate full marks</p>	
<p>Q. 1. A) Choose correct alternatives (10 questions)</p> <p style="padding-left: 40px;">B) Fill in the blanks or true / false (06 questions)</p> <p>Q.2. Answer the following</p> <p style="padding-left: 40px;">A)</p> <p style="padding-left: 40px;">B)</p> <p style="padding-left: 40px;">C)</p> <p style="padding-left: 40px;">D)</p> <p>Q.3. Answer the following</p> <p style="padding-left: 40px;">A)</p> <p style="padding-left: 40px;">B)</p> <p>Q.4. Answer the following</p> <p style="padding-left: 40px;">A)</p> <p style="padding-left: 40px;">B)</p> <p>Q.5. Answer the following</p> <p style="padding-left: 40px;">A)</p> <p style="padding-left: 40px;">B)</p> <p>Q.6. Answer the following</p> <p style="padding-left: 40px;">A)</p> <p style="padding-left: 40px;">B)</p> <p>Q.7. Answer the following</p> <p style="padding-left: 40px;">A)</p> <p style="padding-left: 40px;">B)</p>	<p>10</p> <p>06</p> <p>16</p> <p>(10 + 6 OR 8 + 8)</p> <p>(10 + 6 OR 8 + 8)</p> <p>(10 + 6 OR 8 + 8)</p> <p>(10 + 6 OR 8 + 8)</p> <p>(10 + 6 OR 8 + 8)</p>

MASTER OF COMPUTER APPLICATIONS

SEMESTER II

HCT 3.1: .NET Technology

Course Objectives : To study

- .NET framework and its runtime environment
- Major aspects of C# language
- Object oriented features such as classes, inheritance, interfaces and polymorphism
- New features that are unique to c# such as properties, indexers, delegates, events and namespaces
- Set up a programming environment for ASP.net programs.
- Configure an asp.net application.
- Creating ASP.Net applications using standard .net controls.
- Develop a data driven web application.
- Connecting to data sources and managing them.

Learning Outcomes : The student will be able to:

- describe the concepts of logic preparation;
- recognize and explain the benefits of procedural, event driven, and object-oriented languages;
- explain the basics of GUI design;
- work with Forms, Toolbox controls and Properties;
- be able to design and create Windows programs
- design web applications using ASP.NET
- use ASP.NET controls in web applications.
- debug and deploy ASP.NET web applications
- create database driven ASP.NET web applications and web services

Unit – I

Microsoft .NET framework: Structure, the common language runtime, JIT, CTS, Metadata.

[05]

Introduction to C#

The Dot Net Framework, CLR, CLS, CTS, MSIL, Managed Code, Programming Features of C#,

Introduction of ASP.Net:

Introduction to ASP.Net, ASP.Net Architecture, ASP.Net Page Life Cycle, Page Life Cycle Events, ASP.Net Directives.

Introduction to Windows Programming:

Overview of Windows Forms, Windows Forms Class Hierarchy, Windows of Visual Studio IDE (Start Page, Menu Bar, Solution Explorer Window, Properties Window, Server Explorer Window, Toolbox, Forms Designer), Dynamic Controls.

ASP.Net Web Parts:

Introduction, Advantages of Web Parts, WebPartsManager, CatalogPart, PageCatalogPart, EditorPart, WebPartZone, EditorZone, CatalogZone Controls. [10]

Unit – II

Introduction to ASP.Net: Introduction, difference between ASP & ASP.Net Application, Web Architecture Model, Introduction to Visual Studio for Web Application. [07]

Application and Page Frameworks: Application Location Options, TheASP.NET Page Life Cycle, The ASP.NET Page Structure Options, ASP.NET Page Directives, ASP.NET Page Events, Dealing with Post Backs, ASP.NET Application Folders, Global.asax [08]

Unit – III

ASP.NET Server Controls and Validation Controls: ASP.Net Server Controls, Understanding Validation, Client-Side versus Server-Side Validation, Turning Off Client-Side Validation. [07]

Working with Master Pages: Need and basics of Master Pages, Master Page and Content Page, Programmatically Assigning the Master Page, Nesting Master Pages, Master Page Events. [08]

Unit – IV

ASP.Net State Management: Application State, Session State, Client & server storing, View state, Cache, Hidden Variable, Session object, Profiles, Overview of HTTP Handler & Modules. [15]

References

1. Microsoft Visual C# .NET Step-By-Step, Version 2003: Sharp, Jagger, Publisher: Microsoft Press (Published: 3/2003).
2. Programming in C#: E. Balagurusamy, TMH, 2nd edition, 2008.
3. C# a beginners guide: Herbert Schildt, TMH, 4th edition, 2001.
4. Professional ASP.NET 2.0: Bill Evjen, Scott Hanselman, Farhan Muhammed, Sirnivasa Sivakumar, Devin Rader, Wrox Publication, 2005.
5. Microsoft ASP.NET 2.0 Step by Step: George Shepherd, Microsoft Press,2010.

HCT 3.2: Digital Image Processing

Course Objectives : To study

- Fundamental concepts of a digital image processing system.
- Concepts of image enhancement techniques and Various Image Transforms.
- Compression techniques and Morphological concepts
- Various segmentation techniques, and object descriptors.
- Color models and various applications of image processing

Learning Outcomes : Students will able to:

- Remember the fundamental concepts of image processing.
- Explain different Image enhancement techniques
- Understand and review image transforms
- Analyze the basic algorithms used for image processing & image compression with morphological image processing.
- Contrast Image Segmentation and Representation
- Design & Synthesize Color image processing and its real world applications.

Unit – I :

1. Introduction - Digital image processing, Applications of digital image processing, Fundamental steps in digital image processing, and Components of an image processing system. [5]
2. Digital image fundamentals - Image sampling and quantization, some basic relationships between pixels, Linear and nonlinear operation [5]
3. Image enhancement in the spatial domain -Some basic gray level transformations, Histogram processing, Enhancement using arithmetic/logic operations, Basics of spatial filtering, Smoothing spatial filters, Sharpening spatial filters [5]

Unit – II :

1. Image enhancement in the frequency domain - Introduction to the Fourier transform and the frequency domain, Smoothing frequency-domain filters, Sharpening frequency domain filters, homomorphic filtering [7]
2. Image restoration - A model of the image degradation/restoration process, Noise models, Restoration in the presence of noise only-spatial filtering, Periodic noise reduction by frequency domain filtering [8]

Unit – III :

1. Morphological image processing - Preliminaries, Dilation and erosion, Opening and closing, The hit-or-miss transformation, Some basic morphological algorithms [7]
2. Image segmentation - Detection of discontinuities, Edge linking and boundary detection, Thresholding, Region-based segmentation, Segmentation by morphological watersheds [8]

Unit – IV :

1. Representation and description - Representation, Boundary descriptors, Regional descriptors, Use of principal components for description, Relational descriptors [7]
2. Object recognition - Patterns and pattern classes, Recognition based on decision- theoretic methods, Structural methods [8]

References :

1. Digital image processing by Gonzalez and Woods PHI
2. Image Processing, Analysis and Machine Vision: Milan Sonka, Vaclav Hlavac, Roger Boyle (Thomson Brooks / Cole Edition).
3. Fundamentals of Digital Image Processing: Anil K. Jain (Prentice Edition Hall of India)

HCT 3.3: Mobile Computing

Course Objectives: To study

- To provide both broad and in-depth knowledge, and a critical understanding of mobile computing from different viewpoints: infrastructures, principles and theories, technologies, and applications in different domains.
- To provide a complete overview of the mobile computing subject area, including the latest research.

Learning Outcomes: Students will be able to

- explain the principles of mobile computing technologies;
- list different applications that mobile computing offers to people, employees, and businesses;
- describe the possible future of mobile computing technologies and applications.

Unit – I :

1. WIRELESS TRANSMISSION: Frequencies for radio transmission, Regulations. Signals, Antennas, Signal propagation-Path loss of radio signals, Additional signal propagation effects, Multipath propagation. Multiplexing-Space, Frequency, Time, Code division multiplexing. Modulation- Amplitude, Frequency, Phase Shift Keying, Advanced frequency and phase shift keying, spread spectrum- DSSS, FHSS. Cellular System [8]
2. MEDIUM ACCESS CONTROL: CSMA/CD, Hidden and exposed terminals, Near and Far terminals, SDMA, FDMA, TDMA- Fixed TDM, Classical Aloha, Slotted Aloha, Carrier sense multiple access, Demand assigned multiple access, PRMA, Reservation TDMA, MACA, Polling, CDMA. [7]

Unit – II :

1. TELECOMMUNICATION SYSTEM: GSM – Mobile services, Architecture of a GSM System, Protocol Architecture, Radio Interface, Localization and calling: MTC, MOC, Handover, Security-Authentication, Encryption. [6]
2. WIRELESS LAN: Introduction, Infrared vs radio transmissions, architecture of an infrastructure based IEEE 802.11 and Ad-hoc networks, Protocol architecture, Physical Layer, Format of an IEEE 802.11 frame using DSS. MAC management- synchronization, power management, roaming. Bluetooth Architecture, simple Bluetooth Pico-net. [9]

Unit - III :

1. MOBILE NETWORK LAYER: Entities & terminology in Mobile IP, IP packet delivery agent discovery, Registration. Dynamic Host Configuration Protocol (DHCP) [7]
2. MOBILE TRANSPORT LAYER: Traditional TCP- Congestion control, Slow start, fast retransmit/Fast recovery, implications on mobility. Classical TCP- Indirect TCP, Snooping TCP, Mobile TCP [8]

Unit – IV :

1. INTRODUCTION TO ANDROID: Android System Architecture, Creating and Running Android Applications, Types of Android Applications, Building blocks, Application Manifest, Application Life Cycle, Application Priority and Process States, Creating and Using Resources, The Activity Life Cycle, Android GUI architecture, Views, Layouts, Creating simple android GUI based applications with event handling such as Sudoku game and To-do list. [8]
2. USING BLUETOOTH AND MANAGING NETWORKS IN ANDROID: Using Bluetooth - Introducing the Bluetooth Service, Controlling the Local Bluetooth Device, Discovering and Bonding with Bluetooth Devices, Managing Bluetooth Connections, Communication with Bluetooth. Managing Networks - Monitoring and Managing Your Internet Connectivity, Managing Active Connections, Managing Your Wi-Fi [7]

Reference Books:

1. Mobile communication (2 nd Edition) – John Schiller (Pearson Edition)
2. Wireless LAN: Peter T Davis, Craig R McGuffin (MGH International)
3. Professional Android Development – Reto Meier (Wrox Publication)
4. Hello Android - Ed Burnette (Pragmatic Bookshelf)
5. Android Application Development - Rick Rogers, John Lombardo (O'Reilly Publication)

HCT 3.4: Artificial Intelligence

Course Objectives :

- To create appreciation and understanding of both the achievements of AI and the theory underlying those achievements.
- To introduce the concepts of a Rational Intelligent Agent and the different types of Agents that can be designed to solve problems
- To review the different stages of development of the AI field from human like behavior to Rational Agents.
- To impart basic proficiency in representing difficult real life problems in a state space representation so as to solve them using AI techniques like searching and game playing.
- To create an understanding of the basic issues of knowledge representation and Logic and blind and heuristic search, as well as an understanding of other topics such as minimal, resolution, etc. that play an important role in AI programs.

Learning Outcomes : Students will able to:

- Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.
- Analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game based techniques to solve them.
- Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing
- Attain the capability to represent various real life problem domains using logic based techniques and use this to perform inference or planning.

Unit – I :

1. What is Artificial Intelligence: The AI Problems, The underlying Assumption, What is an AI Technique? [4]
2. Problems, Problem Spaces and Search: Defining the problem, as a state space search, production systems, problem characteristics, production system characteristics, Issues in the design of search programs. [4]
3. Heuristic Search Techniques: Generate-and-Test, Hill Climbing, Best-First Search, Problem Reduction, Constraint Satisfaction Means-Ends Analysis. [7]

Unit – II :

1. Knowledge Representation Issues : Approaches to Knowledge representation, Issues in Knowledge representation. [5]
2. Using Predicate Logic : Representing Simple Facts in Logic, Representing Instance and ISA Relationships, Computable Functions and Predicates, Resolution, Natural deduction. [5]
3. Representing Knowledge Using Rules :Procedural Versus Declarative Knowledge, Forward Versus Backward Reasoning, Matching. [5]

Unit – III :

1. Statistical Reasoning : Probability and Bayes' Theorem, Certainty Factors and Rule-Based Systems, Bayesian Networks, Dempster-Shafer Theory, Fuzzy Logic. [5]
2. Weak Slot-and Filler Structures : Semantic Nets, Frames. [5]
3. Strong Slot-and-Filler Structures :Conceptual Dependency, Scripts. [5]

Unit – IV :

1. Game Playing : Overview, The Minmax Search Procedure, Adding Alpha-Beta Cutoffs, Additional Refinements, Iterative Deepening. [5]
2. Natural Language Processing : Introduction, Syntactic Processing, Semantic Analysis, Discourse and Pragmatic Processing. [5]
3. Expert Systems : Representing and Using Domain Knowledge, Expert System Shells, Explanation, Knowledge Acquisition. [5]

Reference Books :

1. Artificial Intelligence by Elaine Rich, Kevin Knight, TMH, 3rd Edition.
2. Artificial Intelligence : Structures and Strategies for Complex Problem solving by George F Luger, 4th Edition, Pearson Education, Asia.
3. Introduction to Artificial Intelligence and Expert Systems by D W Patterson, PHI, 2nd Edition.

SCT 3.1: Data Warehouse and Mining

Course Objectives :

- Be familiar with mathematical foundations of data mining tools.
- Understand and implement classical models and algorithms in data warehouses and data mining
- Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.
- Master data mining techniques in various applications like social, scientific and environmental context.
- Develop skill in selecting the appropriate data mining algorithm for solving practical problems.

Learning Outcomes :

- Understand the functionality of the various data mining and data warehousing component.
- Appreciate the strengths and limitations of various data mining and data warehousing models
- Explain the analyzing techniques of various data Analyze
- Describe different methodologies used in data mining and data ware housing.
- Compare different approaches of data ware housing and data mining with various technologies.

Unit – I

Introduction: What is Data Warehouse? A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Data cube Technology, From Data Warehousing to Data Mining, Data Mining, Functionalities, Data Cleaning, Data Integration and Transformation, Data Reduction. [08]

Data Mining Primitives, Languages, And System Architectures: Data Mining Primitives, Presentation and Visualization of discovered patterns, A Data Mining Query Language. [07]

Unit – II

Mining Association Rules In Large Data Bases Translation: Association Rule Mining Single-Dimensional Boolean, Association Rules from Transactional Databases, Mining Multilevel Association Rules From Transactional Databases. [15]

Unit – III

Classification And Predication: Issues regarding Classification and Predication, Classification by Decision tree induction, Bayesian Classification, Classification by Back propagation, Baye's Theorem, Classification Based on the concepts from association rule mining, Other classification methods, Prediction. [15]

Unit – IV

Clustering: What is Cluster Analysis? Types of data in Cluster Analysis: A Categorization of Major Clustering Methods. Partitioning Methods, Hierarchical Methods, Density-Based Methods, Model-Based Clustering Methods: Statistical Approach, Neural Network Approach. Outlier Analysis [07]

Applications and Trends in Data Mining: Data Mining Applications, Data Mining System Products and Research Prototypes, Additional Themes on Data Mining, Data Mining and Intelligent Query Answering, Trends in Data Mining. [04]

Introduction to Data Science

What is data science, relation to data mining, machine learning, big data and statistics, Several data science settings, Introduction to the WEKA tool. [04]

Reference Books:

1. Data Mining Concepts and Techniques: Jiawei Micheline Kamber, Morgan Kauf Mann Publishers, 3rd edition, 2011.
2. Modern Data Warehousing, Mining and Visualization: George M. Marakas, Pearson Education, 2003.
3. Building the Data Warehouse: W. H. Inmon, Wiley Dreamtech, Third Edition, 2002.

SCT 3.2: Finite Automata

Course Objectives :

- To learn fundamentals of Regular and Context Free Grammars and Languages
- To understand the relation between Regular Language and Finite Automata and machines.
- To learn how to design Automata's and machines as Acceptors, Verifiers and Translators. To understand the relation between Contexts free Languages, PDA and TM.
- To learn how to design PDA as acceptor and TM as Calculators.
- To learn how to correlate Automata's with Programs and Functions.

Learning Outcomes :Students will able to:

- Understand, design, construct, analyze and interpret Regular languages, Expression and Grammars.
- Design different types of Finite Automata and Machines as Acceptor, Verifier and Translator.
- Understand, design, analyze and interpret Context Free languages, Expression and Grammars.
- Design different types of Push down Automata as Simple Parser.
- Design different types of Turing Machines as Acceptor, Verifier, Translator and Basic computing machine.

Unit – I

Introduction to Finite Automata: Introduction to Finite Automata, the central concepts of Automata theory, deterministic finite automata, non deterministic finite automata, and application, Finite automata with Epsilon transition. [07]

Regular Expressions and Languages, Properties of Regular Languages:

Regular Expression, Finite Automate and Regular Expressions, Applications of Regular Expressions, Proving languages not to be regular, Closure Properties of Regular Languages, Decision Properties of Regular Languages, Equivalence and minimization of automata. [08]

Unit – II

Context-Free Grammars and Languages: Context-free grammars, Parse trees, Applications, Ambiguity in grammars and languages. [07]

Pushdown Automata: Definition of the Pushdown automata, the languages of a PDA, Equivalence of PDA's and CFG's, Deterministic Pushdown Automata. [08]

Unit – III

Properties of Context Free Languages: Normal forms for CFGs, The pumping lemma for CFGs, Closure properties of CFLs. [06]

Introduction to Turing Machines: Problems those computers cannot solve, The Turing Machine, Programming techniques for Turing machines, extension to the basic Turing machine, Restricted Turing Machine, Turing Machine and Computers. [09]

Unit – IV

Undecidability: A Language that is not recursively enumerable, A Non decidable problem that is RE, Post's Correspondence problem, other undecidable problems. [15]

Reference Books:

1. Introduction to Automata Theory: J. P. Hopcroft, Rajeev Motwani, J.D. Ullman, Languages and Computation, II Edition, Pearson Education, 2001.
2. Introduction to Languages and Theory of Computation: John Martin, Tata McGraw Hill, 2003.
3. Introduction to Computer Theory: Daniel I. A., Cohen, 2nd Edition, John Wiley and Sons, Inc, 2000.
4. An Introduction to Formal Languages and Automata: Peter Linz, II Edition, Narosa Publishing House, 1997.

OET 3.1: Open Source Technologies (PHP, MySql)

Course Objective:

This course is aimed to provide a fundamental understanding of dynamic web site creation. PHP is the language used for development of most common web sites. Syllabus includes basic and advanced features of PHP which includes detailed introduction of PHP and MYSQL, Arrays, Loops and variables etc. It also gives an overview open-source Joomla framework.

Unit – I

Introduction to Open Source and PHP programming Introduction to Open Sources Technologies, Introduction to PHP, installation and configuration, Advantages and Disadvantages of PHP, Client-Side Scripting, Server-Side Scripting, Variables, data types, various types of function, creating your own function, Strings in PHP, String Functions. [15]

Unit – II

Operator, Loops, Array, Exception and Error Handling Operators, Conditions, Loops, using for each, Creating and Using Arrays, Multidimensional Array, Associative array. Error Handling in PHP, Errors and Exceptions, Exception class, try/catch block, throwing an exception, defining your own Exception subclass. [15]

Unit – III

Classes, File system, Passing Information between pages Object oriented programming with PHP, Working with Datetime, code re-use, require (), include (), and the include path; Understanding PHP file permissions, File reading and writing functions, File system functions, File uploads, Sending mail & use of email server. HTTP, GET arguments, POST arguments, Using Session in PHP, cookies, The set cookie () function, Deleting Cookies and Reading Cookies. [15]

Unit – IV

Working with database HTML Tables and Database tables, Database manipulation (Select, Insert, Update, Delete), validating User Input using Java script. MYSQL, Introducing MySQL; database design concepts; the Structured Query, Language (SQL); communicating with a MySQL back end via the PHP, MySQL API Building Database Applications, Web site development with Joomla. [15]

References:

1. The Complete Reference PHP, by Steven Holzner, TAYA McGraw-Hill Publication
2. Beginning PHP and MYSQL, by W. Jason Gilmore, Willey press Publication
3. Beginning PHP, Apache, MySQL Web Development, Michael K. Glass, Yann Le Scouarnec, Elizabeth Naramore, Gary Mailer, Jeremy Stolz, Jason Gerner

OET 3.2: SWAYAM Course

1. Student has to register one course of minimum 4 credits from SWAYAM
2. The selected course should not be from the syllabus.
3. After registration student has to report to the SWAYAM mentor of the dept.
4. Student should register for the online exam of the same course, pass the exam. and submit the marklist / certificate from SWAYAM to the mentor.

Course Code: HCP 3.1

Course Title: Practical-I based on HCT 3.1, HCT3.2 and HCT3.3

Minimum 10 Practical Assignments based on HCT 3.1.

Minimum 10 Practical Assignments based on HCT 3.2.

Minimum 10 Practical Assignments based on HCT 3.3.

Course Code: HCP 3.2

Course Title: Project – III

Instructions:

1. Team size for major project not exceed than two students.
2. Real time and live project followed by Presentation and Viva-Voce.

Course Code: OEP 3.1

Course Title: Practical-I based on OET 3.1

Minimum 15 Practical Assignments based on OET 3.1.

SEMESTER IV

Paper Code	Title of the Paper	Contact hrs./week	Distribution of Marks for Exam.			Credits
			Internal	University	Total	
Hard Core –Practical						
HCP 4.1	Project – IV (Major Project)	02	50	200	250	10
Total		02	50	200	250	10

GENERAL INSTRUCTION REGARDING PREPARATION OF PROJECT REPORT FOR MCA-III SEM-VI

TYPING

- (a) The typing shall be standard 12 pts in double spaced
- (b) Margins must be Left : 1.5 inches, Right : 1.5 inches, Top 1.5 inches, Bottom 1.5 inches
- (c) Paper A4 size Bond Paper

COPIES

Two hard-bound copies (Black Rexine with Golden Embossing as per format displayed herewith) one original and one clean Xerox Copy.

FORMAT FOR TITLE PAGE AND FOR EMBOSSING

<p style="text-align: center;">PROJECT REPORT</p> <p style="text-align: center;">ON</p> <p style="text-align: center;"><i>NAME OF THE PROJECT</i></p> <p style="text-align: center;"><i>NAME OF THE COMPANY</i></p> <p style="text-align: center;">BY</p> <p style="text-align: center;"><i>NAME OF STUDENT</i></p> <p style="text-align: center;">Department of Computer Applications School of Computational Sciences Punyashlok Ahilyadevi Holkar Solapur University, Solapur</p> <p style="text-align: center;">MASTER OF COMPUTER APPLICATIONS 20__ - 20__</p>

The Guidelines regarding the documentation

Title Page

Certificate from Company

Certificate from Guide and Head of the Department

Acknowledgement

Index with printed page Numbers

CHAPTER 1 : INTRODUCTION

1.1 Company Profile

1.2 Existing System and Need for System

1.3 Scope of Work

1.4 Operating Environment – Hardware and Software

1.1 Detail Description of Technology Used

CHAPTER 2 : PROPOSED SYSTEM

2.1 Proposed System

2.2 Objectives of System

2.3 User Requirements

CHAPTER 3 : ANALYSIS & DESIGN

3.1 Class Diagram

3.2 Object Diagram

3.3 Use Case Diagrams

3.4 Module Hierarchy Diagram

3.5 Component Diagram

3.6 Deployment Diagram (in case of Web Deployment)

3.7 Module Specifications

3.8 Interface Diagram (in case of WAP and Embedded Systems)

3.9 Web Site Map Diagram (in case of Web Site)

3.10 User Interface Design (Screens etc.)

3.11 Table specifications (in case back end is a database)

3.12 Test Procedures and Implementation

CHAPTER 4 : USER MANUAL

4.1 User Manual

4.2 Operations Manual / Menu Explanation

4.3 Program Specifications / Flow Charts

Drawbacks and Limitations

Proposed Enhancements

Conclusions

Bibliography

ANNEXURES :

ANNEXURE 1 : USER INTERFACE SCREENS

ANNEXURE 2 : OUTPUT REPORTS WITH DATA (if any)

ANNEXURE 3 : SAMPLE PROGRAM CODE (which will prove sufficient development is done by the student)

Equivalent Subjects for Old Syllabus M.C.A.-II (Sem. III and IV)

MCA - II Sem. III		
Sr. No.	Name of the Old Paper (w.e.f. 2021-22)	Name of the New Paper (w.e.f. 2024-25)
1	.NET Technology	.NET Technology
2	Digital Image Processing	Digital Image Processing
3	Mobile Computing	Mobile Computing
4	Artificial Intelligence	Artificial Intelligence
5	Data Warehouse and Mining	Data Warehouse and Mining
6	FiniteAutomata	FiniteAutomata
7	Fundamentals of Web Designing	No equivalence