

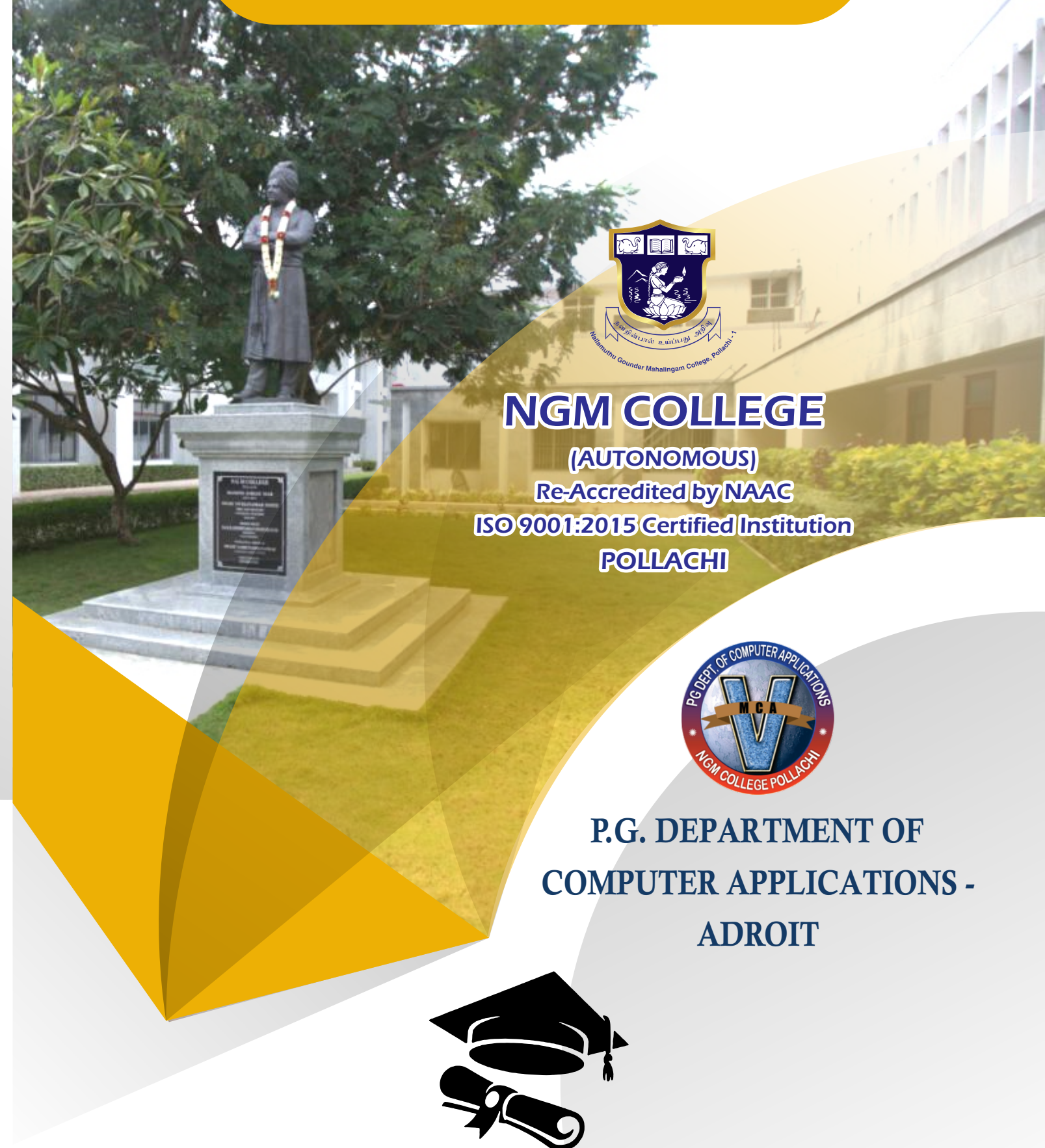


"A College is a temple of wisdom, seed bed of character, model of discipline, training ground of democracy and a nursery of great hearts, strong mind, true faith and willing hands. Hence, education has a pivotal role in harvesting the available resources to contribute to the prosperity of the nation"

- Arutchelvar Dr. N. Mahalingam

Holistic Education for the wholesome development of Human personality for the overall well-being of the Humanity as a whole.

Dr. B. K. Krishnaraj Vanavarayar
President



NGM COLLEGE

(AUTONOMOUS)

Re-Accredited by NAAC

ISO 9001:2015 Certified Institution

POLLACHI



**P.G. DEPARTMENT OF
COMPUTER APPLICATIONS -
ADROIT**



ACADEMIC COUNCIL MEETING

EMPOWER THE YOUTH TO ENRICH THE NATION

11.11.2020

**NALLAMUTHU GOUNDER MAHALINGAM COLLEGE
(AUTONOMOUS)**

POLLACHI

P.G. DEPARTMENT OF COMPUTER APPLICATIONS

Batch No : 30

SYLLABUS FOR THE ACADEMIC YEAR

(2020 - 2022)

NGM College

Vision

Our dream is to make the college an institution of excellence at the national level by imparting quality education of global standards to make students academically superior, socially committed, ethically strong, spiritually evolved and culturally rich citizens to contribute to the holistic development of the self and society.

Mission

Training students to become role models in academic arena by strengthening infrastructure, upgrading curriculum, developing faculty, augmenting extension services and imparting quality education through an enlightened management and committed faculty who ensure knowledge transfer, instill research aptitude and infuse ethical and cultural values to transform students into disciplined citizens in order to improve quality of life.

P.G. Department of Computer Applications

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SCHEME OF EXAMINATION

(FOR THE CANDIDATES ADMITTED FROM THE ACADEMIC YEAR 2020 ONWARDS)

Course Code	Course Title	Lecture+ tutorial/	Duration of Exam Hrs	Marks			Credit Points
				Internal	End of Semeste	Total	
	Semester I						
20PMC101	Digital Fundamentals and Computer Organization	4	3	25	75	100	4
20PMC102	Programming in Java	4	3	25	75	100	4
20PMC103	Database Technology	4	3	25	75	100	4
20PMC104	Mathematical Foundation Course Elective – I	4	3	25	75	100	4
20PMC105	Data and File Structures	4	3	25	75	100	4
20PMC106	Lab I Programming in Java	5	3	40	60	100	2
20PMC107	Lab II Database Technology Lab	5	3	40	60	100	2
Semester Total				205	495	700	24
	Semester II						
20PMC208	Computer Networks	4	3	25	75	100	4
20PMC209	Programming in Python	4	3	25	75	100	4
20PMC210	Software Project Management Elective - II	4	3	25	75	100	4
20PMC211	Information Security	4	3	25	75	100	4
20PMC212	Web Technology	4	3	25	75	100	4
20PMC213	Lab III Programming in Python	5	3	40	60	100	2
20PMC214	Lab IV Programming in Web Technology	5	3	40	60	100	2
Semester Total				205	495	700	24

	SEMESTER-III						
Subject Code	Subject Title	Lecture+ tutorial/ practical	Duration of Exam Hrs	Marks			Credit Points
				Internal	End of Semester	Total	
20PMC315	Open Source Technologies	4	3	25	75	100	4
20PMC316	Data Visualization Techniques – Elective III	4	3	25	75	100	4
20PMC317	Data Analytics	4	3	25	75	100	4
20PMC318	Cloud Computing	4	3	25	75	100	4
20PMC319	Lab – V Programming in Open Source Technologies	4	3	40	60	100	2
20PMC320	Lab – VI Programming in R Tool	4	3	40	60	100	2
20PMC321	Mini Project			20	30	50	2
Semester Total				200	450	650	22

	SEMESTER-IV						
Course Code	Course Title	Lecture+ tutorial/ practical	Duration of Exam Hrs	Marks			Credit Points
				Internal	End of Semester	Total	
20PMC422	Internet of Things	4	3	25	75	100	4
20PMC423	AI and Machine Learning – Elective IV	4	3	25	75	100	4
20PMC424	Online /Skill based Certification			100		100	1
20PMC425	Project and Viva Voce			40	160	200	11
Semester Total							20
Grand Total							90

Credits

4 Theory Hours = 4 Credits

5/4 Lab Hours = 2 Credits

Bloom's Taxonomy Based Assessment Pattern

K1-Remember ;K2- Understanding ; K3- Apply ; K4-Analyze ; K5- Evaluate

1. Theory: 75 Marks

(i) TEST- I & II and ESE:

Knowledge Level	Section		Marks	Description	Total
K1& K2	A(Answer all)	Q 1 to 5	10x1=10	MCQ/Define	75
		Q 6 to 10			
K3	B (Either or pattern)	Q 11 to 15	5x5=25	Short Answers	
K4& K5	C(Answer 4 out of 6)	Q 16 is compulsory	4x10=40	Descriptive/ Detailed	
		Q 17 to 21 (Answer 3 out of 5)			

2. Practical Examinations:

Knowledge Level	Section	Marks	Total
K3	Practicals& Record work	60	100
K4		40	
K5			

Components of Continuous Assessment

Components		Calculation	CIA Total
Test 1	75	$(75+75_25)/7$	25
Test 2	75		
Assignment/Seminar	25		

Programme Outcomes

PO1.

To prepare students to face the industry/ academia/technical profession with confidence

PO2.

To provide students with solid foundation in mathematical and computing fundamentals and techniques required to solve related problems and also to pursue higher studies and research and to train students with good computing breadth so as to comprehend, analyze, design and create computing solutions for the real life problems

Programme Specific Outcomes

- PSO1** Graduates will acquire knowledge of basic mathematics, computing fundamentals, programming concepts and other core computer subjects.
- PSO2** Graduates will have an ability to identify, formulate and implement computing solutions.
- PSO3** Graduates will have an ability to design and conduct experiments, analyze and interpret data.
- PSO4** Graduates will be able to design a system, component or process as per needs and specification.
- PSO5** Graduates will demonstrate effects of computing solutions on the society.

Semester I

Programme code:	MCA	Programme Title :	Master of Computer Application	
Course Code:	20PMC101	Title	Batch :	2020
		Digital Fundamentals and Computer Organization	Semester	I
Hrs/Week:	4		Credits:	4

Course Objective

- The purpose of this syllabus is to make the student to understand the fundamental principles of digital electronics and computer architecture.
- This will make the student to aware about the digital components of the computer hardware

Course Outcomes (CO)

K1	CO1	To remember the concept of machine languages and number system
K2	CO2	To get the idea of logical circuits and boolean equation
K3	CO3	To understand the structure and function of system architecture
K4	CO4	To apply with the real world problems
K5	CO5	To Elaborate advanced concepts of computer architecture, Parallel Processing, inter processor communication and synchronization

Syllabus

Unit-1

Number systems: Complements – Binary codes – error detection code.

Digital Circuits: Logic gates (AND, OR, NOT, NAND, NOR, XOR) – Demorgan's Theorem – Map Simplification Combinational Circuits : Half adder – Full adder – Decoder- Encoder – Multiplexer – Demultiplexer.

12 Hours

Unit-2

Sequential Circuits: Flip flops – RS – D – JK – JK Master/slave – Edge Triggered – Registers: SISO – SIPO- PIPO – Counters: Binary- UP-Down counter – Ring Counter.

10 Hours

Unit-3

Central Processing Unit: General Register organization – Stack Organization – Instruction formats – Addressing modes – Data Transfer and manipulation instruction – Program control.

Arithmetic Processor Design: Addition and Subtraction- Division and Multiplication algorithms.

10 Hours

Unit-4

I/O Organization: Peripheral Devices – I/O Interface – Asynchronous data transfer – mode of transfer – priority interrupt – direct Memory Access – I/O processor. **10 Hours**

Unit-5

Memory Organization: Memory Hierarchy – Main memory – Auxiliary memory – Associative memory. **10 Hours**

Text Books:

- Albert Paul Malvino(1991), , Donald P Leach, “Digital Principles and Applications”, Fourth Edition. Tata McGraw Hill.
- Morris Mano(2008), “*Computer System Architecture*”, Third Edition, Pearson India.

Reference Books:

- V.C Hamachar, Z.G. Vraesic, S.G. Zaky,(2010), “*Computer Organization*”, Fifth Edition, Tata McGraw Hill.
- John p. Hayes(1999), “*Computer Architecture and Organization*”, Third Edition, McGraw Hill.
- William Stallings (2007), “*Computer organization and Architecture – Designing for performance*”, Sixth Edition, Pearson Education,

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	M	H	H	H
CO3	M	H	H	M	M
CO4	M	H	H	L	H
CO5	M	H	H	L	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. M. Rathamani	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC102	Title	Batch :	2020
		Programming in Java	Semester	I
Hrs/Week:	4		Credits:	4

Course Objective

- The main purpose of this syllabus is to provide a platform for learning Java and develop some web based applications.
- To understand the need for new language environment for internet applications. To effectively use the huge library routines while solving problems.
- To handle exceptional situations and to access data to external medium. To make use of java utilities for documentation

Course Outcomes (CO)

K1	CO1	To remember the syntax and the concept of Java
K2	CO2	To understand the format and the usage of the coding
K3	CO3	To implement the concept in terms of programming
K4	CO4	To analyze and interpret the concept
K5	CO5	Application of OOPs Concept using Java

Syllabus

Unit-1

An Overview of Java – Data Types – Variables and Arrays – Operators –Control Structures – Introduction to classes

10 Hours

Unit-2

A closer look at Methods and Classes – Inheritance – Packages and interfaces – Exception Handling – String Handling

10 Hours

Unit-3

Multithreaded Programming – Thread Model – Creating a Thread – Creating Multiple Thread Priorities – Synchronization – Interthread Communication. Networking – Basics – Java and the net – Inet Address – TCP/IP Client Sockets – URL – URL Connection – TCP/IP Server Socket – Data Grams.

10 Hours

Unit-4

Input/Output: Byte Streams – Character Streams –Event Handling – Delegation Event Model – Event Classes – Source of Events – Event Listener Interface -. Applet Basics – Applet Architecture - Applet Skeleton - Simple Applet Display Methods – HTML Applet Tag –Passing Parameters to Applets

12 Hours

Unit-5

Introduction to AWT – Working with Graphics – Working with colors – Using AWT Controls – Layout Managers – Menus – Dialog Boxes – File Dialog – JDBC

10 Hours

Text Book:

- Herbert Schildt ,“ *The Complete Reference – Java* “, 7th Edition, McGraw-Hill Edition

Reference Books:

- Deital and Deital, (2012) “ *Java How to Program*”, Third Edition, Pearson Education Asia
- Herbert Schildt, (2002) *The Complete Reference Java 2*, Third Edition, TMH

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	H
CO2	H	M	H	M	H
CO3	H	M	H	M	M
CO4	M	H	H	M	H
CO5	M	M	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
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Dr. E. Rama Devi	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC103	Title	Batch :	2020
		Database Technology	Semester	I
Hrs/Week:	4		Credits:	4

Course Objective

- Understand fundamental database concepts and the different database systems.
- Understand methodologies to conceptualize and design database systems.
- Identify the key issues in developing database systems and applications.
- Develop applications involving database systems, in particular Web-based applications, and commercial RDBMS such as MySQL, Oracle, SQL Server and Access.

Course Outcomes (CO)

K1	CO1	To remember the fundamentals of data models to conceptualize and depict a database system
K2	CO2	To understand the relational database implementation using SQL with relational database design concepts.
K3	CO3	To apply the internal storage structures using different file and indexing Techniques
K4	CO4	To Analyze the database design procedure for large enterprise database design
K5	CO5	Analyze and design a real database application.

Syllabus

Unit-1

Overview of database systems: Managing data – A historical perspective file systems versus a DBMS – Advantages of a DBMS – Describing and storing data in a DBMS – Queries in a DBMS – Transaction management – Structure of a DBMS.

Database design & ER diagrams – Entities attributes and entity sets – Relationships and Relationship sets – Additional features of the ER model – conceptual database design with the ER model.

12 Hours

Unit-2

Relational Model: Integrity constraints over relations – Enforcing integrity constraints –

Querying relational data – Logical database design; ER to relational introduction to views – Destroying / Altering Tables & Views.

Relational algebra and calculus: Relational Algebra – Relational Calculus. **10 Hours**

Unit-3

SQL: Queries, Programming Triggers: The form of a basic SQL Query – UNION, INTERSECT and EXCEPT – Nested Queries – Aggregate operators – Null values – Complex integrity constraints in SQL – Triggers & Active data bases.

Transaction Management Overview: The ACID properties – Transactions & Schedules – Concurrent execution of transactions – Lock-based concurrency control – performance of locking – Transaction support in SQL. **10 Hours**

Unit-4

Schema Refinement and normal forms: Introduction to schema refinement – Functional dependencies – Reasoning about functional dependencies – Normal forms – Properties of Decompositions – Normalization – Schema refinement in data base design – Other kinds of dependencies.

Security: Introduction to database security – Access control – Discretionary access control – Mandatory access control – Additional issues to security.

Concurrency control: 2PL, serializability and Recoverability – Introduction to lock Management – Lock conversions – Specialized Locking techniques- Concurrency control without locking. **10 Hours**

Unit-5

Parallel & Distributed databases: Introduction – Architecture for parallel databases – Parallel Query evaluation – Parallelizing individual operations – Parallel query optimization – Introduction to distributed databases – Distributed DBMS architecture storing data in a distributed DBMS. **Object Database Systems:** Motivation Example – Structured data types – Operation on structured data types – Encapsulation & ADTS – Inheritance – Objects, OIDS and reference Types – Database design for and ORDBMS – OODBMS – comparing RDBMS OODBMS and ORDBMS. **10 Hours**

Text Book:

- Raghu Ramakrishnan, Johannes Gehrke (2002), “*Database Management Systems*”, Third edition, McGraw-Hill Higher Education.

Reference Books:

- Silberschatry, Korth, Sundarshan (2010), “*Database System Concepts*”, Sixth Edition, McGraw-Hill Higher Education.
- ElmasriNavathe, (2007), “*Fundamentals of Database Systems*”, Fifth Edition, Pearson Education Asia.

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	M	H
CO2	H	M	H	H	H
CO3	M	L	H	M	H
CO4	M	H	H	L	H
CO5	M	M	L	M	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. B. Azhagusundari	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC104	Title	Batch :	2020
		Mathematical Foundation	Semester	I
Hrs/Week:	4	Course – Elective - I	Credits:	4

Course Objective

Mathematical Foundation course Solves

- Modeling linear programs and solving with a computer
- Simplex algorithms to solve linear programs
- Other algorithms for linear programming
- Integer Programming
- Network problems
- Non-linear programming

Course Outcomes (CO)

K1	CO1	To remember the basic principles and practices of computing grounded in mathematics and science
K2	CO2	To understand the Problems using various linear Algorithms
K3	CO3	To apply algorithms to the decision making problems
K4	CO4	To analysis the programming algorithms with exercises
K5	CO5	To Summarize the inventory and queuing models

Syllabus

Unit-1

Introduction: Simplex method – Graphical method – Standard form – IBFS- Artificial Variable technique – big M .

10 Hours

Unit-2

Transportation : Mathematical formulation – Initial feasible solution – North – West Corner Method – Matrix minima method – Vogel’s approximation method – Optimized basic feasible solution- Solution by UV method.

Assignment Problem : Introduction – Definition – Assignment algorithm – Balanced Assignment Problem – Unbalanced Assignment problem – Hungarian Method.

10 Hours

Unit-3

Networks : Networks and basic components – rules – time calculation in networks – CPM –

PERT – PERT Calculations- Resource analysis in network scheduling project cost – time cost optimization algorithm. **10 Hours**

Unit-4

Inventory : Introduction – Reasons for carrying Inventory – Type of Inventories – The Inventory decision – EOQ with no Shortages – Production problem with no shortages – EOQ with Shortages – Production problem with shortages- EOQ with Price Breaks – EOQ with no price breaks – EOQ with two price breaks.

Queuing Theory : Queuing System characteristics – Poisson process and exponential distribution $(M/M/1) : (\alpha / \text{FIFO})$, $(M/M/1) : (N / \text{FIFO})$, $(M/M/C) : (\alpha / \text{FIFO})$, $(M/M/C) : (N / \text{FIFO})$. **12 Hours**

Unit-5

Sequencing : Introduction- problems of sequencing – problems with n jobs and two machines – Problems with n jobs and three machines – problems with n jobs and m machines.

Replacement Theory : Introduction – replacement of equipment or asset the deteriorates gradually – replacement of equipment that fails suddenly. **10 Hours**

Text Book:

- KantiSwarup, P.K. Gupta and Man Mohan, (2008) ,*Operations Research*, Sultan Chand & Sons Educational Publishers, New Delhi.

Reference Books:

- P.K. Gupta, D.S. Hira (2007), “Problem in Operations Research”, S.Chand& Company Ltd.,
- J.K. Sharma(2006) , “Operations Research Theory and Applications”, Third Edition, Macmillan India Ltd.,
- Hamdy A. Taha (2008), “Operations Research : An Introduction” Eight Edition PHI, New Delhi.

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	H
CO2	H	M	H	H	H
CO3	H	H	H	H	H
CO4	M	H	H	L	M
CO5	L	H	M	M	H

H-High; M-Medium; L-Low

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Programme code:	MCA	Programme Title :	MCA	
Course Code:	20PMC105	Title	Batch :	2020
		Data and File Structures	Semester	I
Hrs/Week:	4		Credits:	4

Course Objective

- This syllabus provides the import knowledge on various data structure concepts
- Learn the algorithm analysis techniques.
- Become familiar with the different algorithm design techniques

Course Outcomes (CO)

K1	CO1	To remember the importance of Algorithms and Data structure concept
K2	CO2	To understand the Algorithms and Data structures used for solving a problem are much more important than knowing the exact code for it in some programming language.
K3	CO3	To apply an insight into the intrinsic nature of the problem as well as possible solution techniques, independent of programming language or any other implementation technique.
K4	CO4	To Analyze the Algorithms and Data structures in productive programmer
K5	CO5	Ability to choose appropriate algorithm design techniques for solving Problems.

Syllabus

Unit-1

Introduction – Overview – types of data – How to create programs – how to analyze programs – arrays – representation of arrays – recursion–**Elementary data structures:** Stacks and queues – Graphs – Linked lists – doubly linked lists – Application of linked lists. **12 Hours**

Unit-2

Trees: Basic Terminology – Binary tree – Representation – Binary Tree traversal – more on binary tree – representation of tree, spanning trees. Symbol Tables – Static tree tables – Dynamic tree tables – hash tables. **10 Hours**

Unit-3

Divide and conquer: General Method – Binary search – Finding maximum and minimum – Merge sort – Quick sort.

Greedy Method: The general method – Knapsack problem – job sequencing with deadlines – Minimum cost spanning trees – single source shortest paths. **10 Hours**

Unit-4

Dynamic Programming: The general method – Multistage graphs – all pairs shortest paths – Optimal binary search trees – 0/1 Knapsack problem – Travelling salesperson problem – Flow shop scheduling.

Basic Traversal and search techniques: Techniques for binary trees – Techniques for graphs. **10 Hours**

Unit-5

Backtracking: The general method – 8-queens problem – sum of subsets – graph coloring – Hamiltonian cycles – Knapsack problem.

Branch and Bound: The method– 0/1 Knapsack problem–Travelling salesman problem.

10 Hours

Text Books:

- Ellis Horowitz & Sartaj Sahni (1981), “*Fundamentals of data structures*”, Ninth Edition, Galgotia Publications.
- Ellis Horowitz, Sartaj Sahni and S. Rajasekharan, “*Fundamentals of Computer Algorithms*”, 2nd Edition, Universities Press.

Reference Books:

- Robert L. Kruse (1984), “*Data Structures and Program Design*”, Second Edition, Prentice Hall Publications.
- Dromey, R. G. (2008) “*How to Solve it by computer*”, Fourth Edition, Pearson Education, India
- Larry L. Peterson & Bruce S. Davie, (2000) “*Computer Networks – A Systems Approach*”, 2nd edition, Harcourt Asia/Morgan Kaufmann.
- William Stallings (1997), “*Data and Computer Communications*”, 5th edition, PHI publications.

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
C01	H	H	M	H	H
C02	H	M	H	H	H
C03	M	H	L	M	M
C04	M	H	H	L	H
C05	M	M	H	L	M

H-High; M-Medium; L-Low

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Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	MCA	
Course Code:	20PMC106	Title	Batch :	2020
		Lab I	Semester	I
Hrs/Week:	5	Programming in Java	Credits:	2

Course Objective

- To understand the practical knowledge of Java Program
- Enable the students to write and execute the program
- Simple projects using JDBC Connectivity

Course Outcomes (CO)(for Practical Only)

K3	CO1	To remember and recollect the concept of Java
K4	CO2	To get the idea of java syntax and its structure
K5	CO3	To validate the projects using Java

Program – 1	Class, objects, recursion , constructor, destructor
Program – 2	Array Using sorting techniques
Program – 3	Inheritance
Program – 4	Package
Program – 5	Interface
Program – 6	Multithreading
Program -7	String handling
Program – 8	Applets
Program – 9	AWT tools
Program – 10	Event handling
Program – 11	I/O operations
Program – 12	Networking
Program – 13	JDBC
Program – 14	Animation

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	H	H
CO2	H	M	M	M	H
CO3	H	M	M	H	M
CO4	M	H	H	H	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
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Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC107	Title	Batch :	2020
		LABII Database Technology Lab	Semester	I
Hrs/Week:	5		Credits:	2

Course Objective

- Understand the fundamental design concepts of applications using vb and oracle.

Course Outcomes (CO)(for Practicals Only)

K3	CO1	To remember and recollect the concept of visual basic and sql statements
K4	CO2	To get the idea of visual basic structure and DDL,DML,DTL statement
K5	CO3	To validate the projects using VB and oracle database

Program 1	Programs using Application wizard.
Program 2	SDI, MDI Drawing inside the view window, Device Context.
Program 3	Program to handle Basic events.
Program 4	The message map, saving the view's state, initializing a view Class data member.
Program 5	Programs using graphical devices interface objects
Program 6	Program to display modal and modeless dialogs.
Program 7	Program using Static and dynamic controls.
Program 8	Program using document – view architecture.
Program 9	Programs with toolbars and status bars.
Program 10	Program using SDI and MDI serialization.
Program 11	Program to create dynamic link libraries using MFC.
Program 12	Program to interface with database.
Program 13	Oracle: SQL Operations
Program 14	Queries
Program 15	Database Triggers
Program 16	Procedures
Program 17	Functions
Program 18	Cursors
Program 19	Implicit cursors
Program 20	Packages
Program 21	Exceptions

Mapping

PSO CO \	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	M	H
CO2	H	M	H	H	H
CO3	M	L	H	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
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Signature:	Signature:	Signature:	Signature:

Semester II

Programme code:	MCA	Programme Title :	Master of Applications	
Course Code:	20PMC208	Title	Batch :	2020
		Computer Networks	Semester	II
Hrs/Week:	4		Credits:	4

Course Objective

- This syllabus provides an understanding of the various principles, protocols and design aspects of computer networks.
- Discuss, learn and critique various network technologies and data communication technologies.
- To learn the wide area and local area networks.
- To learn the various communication protocols and applications.

Course Outcomes (CO)

K1	CO1	To remember the concept of OSI and TCP network models and the layers associated functionalities
K2	CO2	To understand different types of network models and topology
K3	CO3	To apply different types of error detection and correction mechanisms
K4	CO4	To Analyze flow control and Error control mechanism using network layer concept
K5	CO5	Evaluate the modern network architecture, protocols and applications

Existing Syllabus

Unit-1

Network fundamentals: use of computer networks – network hardware – network software – reference model – OSI reference model – TCP/IP model

Physical Layer : The theoretical basis for data communication – guided transmission media – wireless transmission – communication satellites.

12 Hours

Unit-2

Data link Layer : Data link layer design issue – error detection and correction – elementary data link protocols – sliding window protocol – protocol specification and verification.

10 Hours

Unit-3

Network Layer: Network layer design issues – routing algorithms(shortest path routing , distance vector, link state, mobile routing) – Internetworking- network layer in the internet (IP protocol, IP addresses, subnet, internet control protocols) **10 Hours**

Unit-4

Transport Layer: The transport service- elements of transport protocol-a simple transport protocol- the internet transport protocols: TCP(TCP service models, TCP protocol)-UDP- wireless TCP and UDP. **10 Hours**

Unit-5

Application Layer: DNS, Telnet, rlogin, SNMP, Email,World Wide Web. Multimedia: Introduction to Digital Audio – Audio Compression – Streaming Audio- Internet Audio- Voice Over IP-Introduction to Video- Video Compression – The JPEG Standard – The MPEG Standard **10 Hours**

Text Book:

- Andrew S Tanenbaum, (2003) ,“*Computer Networks*”, IV Edition, Pearson ducation.

Reference Books:

- Larry L.Peterson& Bruce S.Davie, (2000) “*Computer Networks – A Systems Approach*”, 2nd edition , Harcourt Asia/Morgan Kaufmann,.
- William Stallings(1997), “*Data and Computer Communications*”, 5th edition, PHI publications.
- P.Green, (1982), “*Computer Network Architecture and protocols*”, 1st edition, Plenum Press

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	H	H
CO2	L	M	H	L	H
CO3	H	H	H	H	M
CO4	M	H	M	H	H
CO5	M	M	H	M	L

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. B. Azhagusundari	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC209	Title	Batch :	2020
		Elective I Programming in Python	Semester	II
Hrs/Week:	4		Credits:	4

Course Objective

- To enable the students to understand the core principles of the Python Language.
- To use the tools to produce well designed programs in python.
- To create effective GUI applications.

Course Outcomes (CO)

K1	CO1	To remember the principles of structured programming Recognize and construct common programming idioms: variables, loop, branch, subroutine, and input/output.
K2	CO2	To understand the common programming idioms: variables, loop, branch, subroutine, and input/output
K3	CO3	To deploy the concepts of lists, tuples, dictionaries, standard libraries, modular programming and the design of user interfaces
K4	CO4	To figure out ability to analyze and solve the problems using advanced facilities of the Python language
K5	CO5	Apply the best features of Python to program real life problems

Syllabus

Unit – I

Introduction: Introduction to Python- an interpreted high level language- interactive mode and script mode. Variables- Expressions and Statements: Values- Variables and keywords; Operators and Operands in Python: (Arithmetic - relational and logical operators)- operator precedence- Expressions and Statements(Assignment statement); Taking input (using rawinput() and input()) and displaying output(print statement);Putting Comments.

12 Hours

Unit II

Built in Functions: Importing Modules (entire module or selected objects) – invoking built- in functions - functions from math module (ceil, floor, fabs, exp, log, log10, pow, sqrt, cos, sin,

tan, degrees, radians) - using random() and randint() functions of random module to generate random numbers- composition. Defining functions- invoking functions- passing parameters (default parameter values- keyword arguments). **10 Hours**

Unit III

Variables: Scope of variables- void functions and functions returning values- flow of execution
Conditional constructs and looping: if.. else statement -While- For (range function)- break-
continue- - pass- Nested loops- use of compound expression in conditional constructs.
Strings: Creating- initializing and accessing the elements- String operators: +, *, in, not in, range
slice[n:m] Comparing strings using relational operators.
String functions & methods: len- capitalize- find- isalnum- isalpha- isdigit- lower- islower-
isupper- upper-lstrip- rstrip- isspace- istitle- partition- replace- join- split- count- decode-
encode-swapcase-PatternMatching. **10 Hours**

Unit IV

List functions & methods: Concept of mutable lists- creating- initializing and accessing the
elements- traversing- appending-updating and deleting elements - List operations (joining- list
slices)-len- insert- append- extend- sort- remove- reverse- pop. Dictionaries: Concept of key-
value pair- creating- initializing and accessing the elements in a dictionary- traversing-
appending- updating and deleting elements. Dictionary functions & Methods: cmp- len- clear()-
get()- has_key()- items()- keys()- update()- values(). Tuples: Immutable concept - creating -
initialising and accessing the elements in a tuple. Tuple functions: cmp()- len()- max()- min()-
tuple().

Modules: Modules-Standard Modules – sys- time- dir functions.Exceptions- Errors- Run Time
Errors - The Exception Model- Exception Hierarchy- Handling Multiple Exceptions- raise -
assert- Writing Your Own Exception Classes **10 Hours**

Unit-V

Files: text files, reading and writing files, format operator; command line arguments, Packages
Python Objects and Class: Defining a Class, Creating an object, Constructors, Inheritance,
Operator overloading

GUI: Introduction- Components and Events- An Example GUI- The root Component- Adding a Button- Entry Widgets- Text Widgets- Checkbuttons- Radiobuttons- Listboxes- Frames- Menus- Binding Events to Widgets.

12 Hours

Text Books:

- Mark Lutz “Learning Python”, 5th Edition, O’Reilly mediaPublications, 2013 (UNIT I - V).
- Welsey J. Chun, “Core Python Programming”, 2nd Edition, Prentice Hall, 2009 (UNIT I -IV).

Reference Books:

- Allen B. Downey, “Think Python: How to Think Like a Computer Scientist”, 2nd edition, Updated for Python 3, Shroff/O’Reilly Publishers, 2016, (<http://greenteapress.com/wp/thinkpython/>)
- Guido van Rossum and Fred L. Drake Jr, “An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	M	H	H	H
CO3	M	H	H	M	M
CO4	M	H	H	L	H
CO5	M	M	H	L	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. S. Niraimathi	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC210	Title	Batch :	2020
		Software Project Management – Elective II	Semester	II
Hrs/Week:	4		Credits:	4

Course Objective

On successful completion of the course the students should have:

- Understood the Software configuration management
- Understood the Activity Planning , Risk Management using case studies

Course Outcomes (CO)

K1	CO1	To remember and recollect the concept of software engineering
K2	CO2	To get the idea of various phases of software engineering
K3	CO3	To understand the coding part of software projects
K4	CO4	Understood the Activity Planning , Risk Management
K5	CO5	Case studies

Syllabus

Unit I

Introduction to Software Projects – An Overview of Project Planning – Project Evaluation – Selection of an appropriate Project approach – Software effort Estimation. **10 Hours**

Unit II

Activity Planning – Project Schedules – Sequencing and Scheduling Projects – Network Planning Model – forward and backward pass-Identifying the Critical path-Activity floatShortening Project Duration – Identifying Critical Activities-precedence networks.

12 Hours

Unit III

Risk Management – Resource Allocation – Monitoring and Control – Managing People and Organizing Teams – Planning for Small Projects. **10 Hours**

Unit IV

Software Configuration Management – Basic Functions – Responsibilities – Standards – Configuration Management – Prototyping – Models of Prototyping. **10 Hours**

Unit V

Case Studies - Application of SPM concepts in Hospital information systems or information systems of any small and medium scale Industry – SPM in Hospital information management System, Small and Medium Scale Enterprises – Application of SPM in Marketing **10 Hours**

Text Book

- Mike Cotterell, Bob Hughes, “Software Project Management”, Inclination/Thomas Computer Press, 1995.

Reference Books

- Darrel Ince, H.Sharp and M.Woodman, “Introduction to Software Project Management and Quality Assurance”, Tata McGraw Hill, 1995.
- Ramesh Gopalasamy, “Managing Global Software Projects”, 2005. 4. S. A. Kelkar, “Software Project Management: A Concise Study”, PHI Learning Pvt. Ltd., Dec-2012

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	M	M	H	H
CO3	H	H	M	H	M
CO4	M	H	H	H	M
CO5	M	M	L	H	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. E. Rama Devi	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC211	Title	Batch :	2020
		Information security	Semester	II
Hrs/Week:	4		Credits:	4

Course Objective

- To understand the basics of Information Security.
- To know the legal, ethical and professional issues in Information Security.
- To know the aspects of risk management.
- To become aware of various standards in this area.
- To know the technological aspects of Information Security

Course Outcomes (CO)

K1	CO1	To remember the concept of SDLC and secSDLC
K2	CO2	To understand the concept of security attacks, threats and issues
K3	CO3	To apply the concept of risk management
K4	CO4	To analysis the concept of logical and physical design
K5	CO5	To know the methods of conventional encryption.

Syllabus

Unit-1

INTRODUCTION : History- What is Information Security- Critical Characteristics of Information- NSTISSC Security Model,-Components of an Information System- Securing the Components- Balancing Security and Access,-The SDLC-The Security SDLC **10 Hours**

Unit-2

SECURITY INVESTIGATION :Need for Security- Business Needs- Threats- Attacks- Legal-Ethical and Professional Issues. **10 Hours**

Unit-3

SECURITY ANALYSIS :Risk Management: Identifying and Assessing Risk- Assessing and Controlling Risk. **10 Hours**

Unit-4

LOGICAL DESIGN :Blueprint for Security- Information Security Poicy- Standards and Practices, ISO 17799/BS 7799,-NIST Models,-VISA International Security Model,-Design of Security Architecture,-Planning for Continuity. **12 Hours**

Unit-5

PHYSICAL DESIGN :Security Technology-IDS- Scanning and Analysis Tools,-
Cryptography,-Access Control Devices- Physical Security- Security and Personnel. **10 Hours**

Text Books:

- Michael E Whitman and Herbert J Mattord (2003), "*Principles of Information Security*", Fourth Edition, Vikas Publishing House, New Delhi.

Reference Books:

- Micki Krause, Harold F. Tipton (2004), " *Handbook of Information Security Management*", Vol 1-3 CRC Press LLC,.
- Stuart McClure, Joel Scrambray, George Kurtz,(2003) "*Hacking Exposed*", Tata McGraw-Hill.
- Matt Bishop,(2003) " *Computer Security Art and Science*", Second Edition,Pearson/PHI

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	H	H
CO2	L	M	H	L	H
CO3	H	H	L	M	H
CO4	M	H	H	L	M
CO5	M	H	M	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. M. Rathamani	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC212	Title	Batch :	2020
		Web Technology	Semester	II
Hrs/Week:	4		Credits:	4

Course Objective

- To understand the basics of web designing and internet programming
- To develop interactive and dynamic web applications using JavaScript, VBscript, DOM, XML and ASP script
- To explore different standards of web services

Course Outcomes (CO)

K1	CO1	To remember the basic structure of JavaScript and create dynamic WebPages
K2	CO2	To understand the dynamic WebPages validation
K3	CO3	To apply the WebPage design using various scripting language
K4	CO4	To analysis the design concept to various web site design development
K5	CO5	To Analysis the concept of dynamic web page creation

Syllabus

Unit-1

Java Script(JS): Introduction – Web pages- Database Connectivity- Client Side Java Script – Advantages of Java Script – Writing Java script into HTML – Basic Programming techniques-Data types & Literals - Functions - Operators Comparisons - Conditions -Switch - Loop :For -While - Breaks - Errors - Event Handling - Validation

JS Html DOM: DOM Introduction DOM HTML DOM CSS DOM Events DOM Nodes

JS Object: Number - String -Date - Array – Boolean- Math- - RegExp - Window - Screen – Location- History Navigator PopupAlert - Timing - Cookies - Libraries - JQuery - Prototype

12 Hours

Unit-2

VB Script: VBScript Basics- VB Variables Sub types and Constants- Arrays- VBScript operators-VBScript Procedures- Program control and Structures- Built in functions and statements, objects, using Cookies, frames and Animation with VB Script - Strings and Numbers-

Message and Input boxes- Dates and Times-The Document Object Model – Event handlers

10 Hours

Unit-3

ASP: ASP Introduction- Syntax- Variables- Procedures - Forms - Cookies - Session - Application - Send Email - **Objects:** Response - request -Session Server - Error - file System - TextStream - Drive - File - Folder -Dictionary

ADO Components: AdRotator- Browser Cap -Content Linking - Content Rotator **10 Hours**

Unit-4

Introducing XML: An Eagle's Eye View of XML -XML Applications- Your First XML Document- Structuring Documents- Attributes, Empty Tags, and XSL-Well-Formed XML Documents

Document Type Definitions: Document Type Definitions and Validity - Element Declarations- Attribute Declarations- Entity Declarations- Namespaces

Style Sheets: CSS Style Sheets-CSS Layouts- CSS Text Styles- XSL Transformations- XSL Formatting Objects **10 Hours**

Unit-5

Introducing SOA: Fundamental SOA- Common Misperceptions about SOA- Common tangible benefits of SOA- Common pitfalls of adopting SOA. The Evolution of SOA:-from XML to Web services to SOA, The continuing evolution of SOA, The roots of SOA. Web Services and Primitive SOA: The Web services framework- Services, Service descriptions, messaging with SOAP. **10 Hours**

Text Books:

- Ivan Bayross(2009), “Web Enabled Commercial Application Development Using HTML,DHTML,Javascript,PERL,CGI” Edition IIBPB Publications.
- William-J-Orvis(1998), “Understanding VB Script-Web page Interactivity”, Galgotia Publications,
- H.M Deitel, P.J Deital, T.R Neito, T.M Lin, P Sadhu(2001) “XML – How to Program- Featuring Java2, Perl CGI and Active Server Pages”, Pearsons Education, 2nd Edition.
- Thomas Erl ,” Service-Oriented Architecture: Concepts, Technology & Design”, Pearson Education Pte Ltd 2008.

Reference Books:

- Nicholas C. Zakas “Professional JavaScript for Web Developers “ 3rd Edition
- Cristopher J Goddard, Mark White “Mastering VB Script “— Galgotia Publications
- Elliotte Rusty Harold(2004), “XML 1.1 Bible”, 3rd Edition, John Wiley & Sons.

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	H	H
CO2	H	M	H	M	H
CO3	H	L	H	H	L
CO4	M	H	H	L	H
CO5	H	L	H	H	L

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. B. Azhagusundari	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC213	Title:	Batch :	2020
		Lab III Programming in Python	Semester	II
Hrs/Week:	5		Credits:	2

Course Objective

To give a basic introduction to object-oriented and procedural programming, using Python

Course Outcomes (CO)

K3	CO1	To remember the principles of structured programming Recognize and construct common programming idioms: variables, loop, branch, subroutine, and input/output.
K4	CO2	To understand the common programming idioms: variables, loop, branch, subroutine, and input/output
K5	CO3	To figure out ability to analyze and solve the problems using advanced facilities of the Python language

Syllabus

Program – 1	Program to find the factorial of a number using recursion
Program – 2	Program to implement the control structures
Program – 3	Program to implement the list
Program – 4	Program to implement the operations and methods of the String
Program – 5	Program to implement the Tuples
Program – 6	Program to implement the Dictionaries
Program -7	Program to import and use the system libraries
Program-8	Program to implement the modules
Program-9	Program to implement the standard modules
Program-10	Program to implement Exceptions and Error handling
Program -11	Program to implement Objects and Class
Program-12	Program to demonstrate File handling
Program-13	Program to create Menu using Tkinter
Program-14	Program to generate frames using TKinter
Program-15	Program to emulate a calculator using TKinter

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	M	H	H	H
CO3	M	H	H	M	M
CO4	M	H	H	L	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. S. Niraimathi	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC214	Title	Batch :	2020
		Lab – IV Web Technology	Semester	II
Hrs/Week:	5	Lab	Credits:	2

Course Objective

- To understand the practical knowledge of scripting language
- To provide an opportunity to practice various Scripts like HTML, XML and JavaScript. To design the Web application using CSS and Built in functions.
- To create simple web applications by using xml concepts

Course Outcomes (CO)(for Practicals Only)

K3	CO1	To remember and recollect the concept of scripting language
K4	CO2	To get the idea of scripting syntax and its structure
K5	CO3	To validate the projects using scripting language

Program -1	Create a JS code block using arrays to generate the current date in words
Program -2	Create a JS code block which checks the contents entered in a forms text element
Program -3	Create a JS code block that validate username and password
Program -4	Create a web page using two image files switch between one another at the mouse pointer moves over the images
Program -5	Create a web page which accept the user information and commands on the web site to check if all the text fields have been entered with data else display an alert
Program -6	Write text using VBscript
Program -7	Write html using VBscript
Program -8	Create an Array Using VBScript
Program -9	Create a Procedure using VBScript
Program -10	Write a program using VBScript built in functions
Program -11	Design the XML elements to hold membership information for a computer club
Program -12	XML document to hold the elements for 5 students
Program -13	Create a Link to a CSS to display student information
Program -14	Create a Cookie program using ASP
Program -15	Create a session object using ASP

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	H	M	M
CO2	H	H	H	H	L
CO3	M	H	M	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. B. Azhagusundari	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Semester III

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC315	Title	Batch :	2020
		Open Source Technologies	Semester	III
Hrs/Week:	4		Credits:	4

Course Objective

- To introduce the concept of open Source Software.
- Understand the difference between open source software and commercial software.
- To enable students to learn Linux Environment.
- Familiarity with Linux operating system.

Course Outcomes (CO)

K1	CO1	Understand the difference between open source software and commercial software.
K2	CO2	Identify, install and run Linux operating system.
K3	CO3	Install and manage applications.
K4	CO4	To perform Shell Programming.
K5	CO5	Case Studies

Syllabus

Unit-I

Over View of Open Source Software: Need of Open Sources –Advantages of Open sources – Applications- FOSS – FOSS usage –Free Software Movement – Comercial Aspect of Open Source Movement – Licensing – Certification – Open Source Software Development Model – comparision with close source / Proprietary software – Free Software – Open source Vs source – available –Widely used open source software license :Apache License, BSD license, GNU General Public License, GNU Lesser General Public License, MIT License, Eclipse Public License and Mozilla Public License.

12 hours

Unit-II

Open Source Operating System Installation of Linux (Redhat-CentOS): Theory about Multiboot Enviroment, Hardisk Partitioning, Swap space, LVM, and Bootloader Command Line: Basic File System Manamngnet Task, Working with files, Piping and Redirection, Working with VI editor, use of sed and understanding FHS of Linux

10 hours

Unit-III

Open Source Operating System: system Administrator task Job management, Process Mangment, Mounting Devices and filesystem working with Linux, Backup, working with user, group and permission, Managing Software. Understanding Boot process and related files, Common kernel Management Task **10 hours**

Unit-IV

Open source Operating System: Network and Security Administration Basic networking commands, Configuration of Apache Web servers, DNS servers, DHCP servers, mail Servers, NFS, FTP servers. Securing servers with IPTables. Setting up cryptographic services, SSL, Managing Certificate with OpenSSL, working with the GNU Privacy guard. **10 hours**

Unit-V

Open Source Operating System: Shell Programming Bash Shell Scripting, Executing Script, Working with Variables and Input, Using Control Strutures, Script control, handling with signals, Creating functions, working sed and gawk -Working with web using shell script: Downloading web page as formatted text file and parsing for data, working cURL etc. **10 hours**

Text Books:

- Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, “Linux in a Nutshell”, Sixth Edition, OReilly Media, 2009.
- Sander van Vugt , “Red Hat Enterprise Linux 6.0: Real World Skills for Red Hat Administrators”, Wiley publications, 2013
- Sarath Lakshman ,“Linux Shell scripting Cookbook” PACKT publications, 2011
- DayanandAmbawade, Devan Shah, “Linux Labs and Open source Technologies”,Dreamtech Press, 2014

Reference Books:

- Philosophy of GNU URL: <http://www.gnu.org/philosophy/>.

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	H
CO2	H	M	H	H	H
CO3	H	H	H	H	H
CO4	M	H	H	L	M
CO5	H	H	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. S. Niraimathi	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	MCA	
Course Code:	20PMC316	Title	Batch :	2020
		Data Visualization Techniques – Elective III	Semester	III
Hrs/Week:	4		Credits:	4

Course Objective

- To develop skills to both design and critique visualization
- To understand why visualization is an important part of data analysis
- To understand the components involved in visualization design
- To understand the type of data impacts the type of visualization

		Course Outcomes (CO)
K1	CO1	Describe the concept of data preparation and categories the data
K2	CO2	Illustrate the map and scatter plot
K3	CO3	Analyse the data using various charts and review the chart based on the problem
K4	CO4	Evaluate and compare the solutions by best practices
K5	CO5	Case studies

Unit-I

Data Preparation :Importing Data - Text files -Excel spreadsheets –Statistical packages - Databases - Cleaning Data : Selecting variables – Selecting observations - Creating/Recoding variables - Summarizing data - Using pipes - Reshaping data - Missing data - Introduction to ggplot2 -ggplot- geoms - grouping scales - facets -labels- themes - Placing the data and mapping options-Graphs as objects

10 Hours

Unit-II

Univariate Graphs - Categorical : Bar Chart -Pie Chart - Tree MapQuantitative - Histogram - Kernel Density plot - Dot Chart – Bivariate Graphs - Categorical vs. Categorical : Stacked bar chart - Grouped bar chart - Segmented bar chart - Improving the color and labeling - Other plots -Quantitative vs. Quantitative :Scatterplot - Line plot- Categorical vs. Quantitative: Bar chart (on summary statistics) - Grouped kernel density plots - Box plots -Violin plots -Ridgeline plots -

Mean/SEM plots - Strip plots - Beeswarm Plots -Cleveland Dot Charts - Multivariate Graphs - Grouping –Faceting **12 Hours**

Unit- III

Maps: Dot density maps-Choroplethmaps:Data by country-Data by US stateData by US county - Time-dependent graphs: Time series- Dummmbell charts - Slope graphs - Area Charts - Statistical Models : Correlation plots – Linear Regression - Logistic regression - Survival plots - Mosaic plots **10 Hours**

Unit- IV

3-D Scatterplot : Biplots - Bubble charts - Flow diagrams -Sankey diagramsAlluvial diagrams - Heatmaps - Radar charts - Scatterplot matrix – Waterfall charts- Word clouds -Customizing Graphs - Axes: Quantitative axes - Categorical axes - Date axes- Colors: Specifying colors manually-Color palettes: Points & Lines: Points - Lines - Fonts - Legends: Legend locationLegend title - Labels- Annotations: Adding text - Adding lines – Highlighting a single group - Themes- Altering theme elements - Pre-packaged themes **10 Hours**

Unit- V

Saving Graphs : Via menus - Via code - File formats -External editing - Interactive Graphs - leaflet - plotly -rbokeh - rCharts - highcharter- Best Practices: Labeling - Signal to noise ratio - Color choice- y-Axis scaling – Attribution. **10 Hours**

Text Book

- Rob Kabacoff , Data Visualization with R, Bookdown, 2018. Chapters: 1-13
- <https://rkabacoff.github.io/datavis/>

Reference

- KirthiRaman - Mastering Python Data Visualization - Packt Publishing -2015

Mapping

PSO/ CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	H	L	M	H
CO2	M	M	H	M	H
CO3	L	M	H	H	M
CO4	M	H	H	M	H
CO5	M	M	H	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. B. Azhagusundari	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	MCA	
Course Code:	20PMC317	Title	Batch :	2020
		Data Analytics	Semester	III
Hrs/Week:	4		Credits:	4

Course Objective

- To understand the concept of data mining , Data Analytics and big data.
- To understand association rules, classification and prediction and clustering
- To learn data mining and big data environments

Course Outcomes (CO)

K1	CO1	To remember and recollect the concept of Data base
K2	CO2	To get the idea of data mining and big data
K3	CO3	To apply the concept in the real world problems
K4	CO4	To analyze the results with practical problems
K5	CO5	Implementation using R

Syllabus

Unit-1

Introduction – Data Mining – Need of Data Mining – Kinds of data – Data mining Functionalities – Interesting patterns – classification of data mining systems. **10 Hours**

Unit-2

Mining Frequent Patterns, Associations and Correlations: Basic concepts and a Road Map – Apriori Algorithm – Generating Association rules from frequent item set.

Classification and Prediction - Definition - Issues regarding classification and Prediction - Decision Tree Induction – Rule Based Classification **12 Hours**

Unit-3

Cluster Analysis – Types of Data – categorization of major clustering methods – Partitioning Methods: K-Means and K-Medoids – CLARANS – Hierarchical Methods : Agglomerative and Divisive – BIRCH – ROCK – CHAMELEON **10 Hours**

Unit-4

Fundamentals of Big Data: Evolution of Data Management-Managing the data – Big Data - **Big Data Types:** Structured data – Unstructured Data

Big Data Technology Components: Big Data Stack – Redundant Physical Infrastructure – Security Infrastructure – Operational Databases – Organizing Data Services and Tools – Analytical Data Warehouses – Big Data Analytics – Big Data Applications. **10 Hours**

Unit-5

Operational Database: Relational, Non-relational, Key-value Pair, Document, Columnar, Graph, Spatial, polygot Persistence.

Introducing R- Understanding features of R – Studying the popularity of R – Introducing Big Data – Getting information about popular organizations that hold big data – Introducing Hadoop – Exploring Hadoop features – Studying Hadoop Components – Reason for using R and Hadoop together **10 Hours**

Text Books:

- Jiawei Han and Micheline Kamber (2008) “*Data Mining Concepts and Techniques*” Second Edition, Elsevier, Reprinted .
- Judith Hurwitz, Alan Nurgent, Dr. Fern Halper, Marcia Kaufman,(2013) “ *Big Data for Dummies* ” ,First Edition,A Wiley Publication
- Vignesh Prajapathi, Big Data Analytics with R and Hadoop, PACKT Publishing, 2013.

Reference Books:

- Margaret H. Dunham (2003), “*Data mining introductory and advanced topics*”, Pearson education,.
- ArunK.Pujari (2003), “ *Data Mining Techniques*”, Universities Press (India) Pvt. Ltd.,.
- Michael Minelli, Michele Chambers, AmbigaDhiraj,(2013) “*Big Data, Big Analytics – Emerging Business Intelligence and Analytic Trends For Todays Businesses*”, First Edition,A Wiley Publication,

Mapping

PSO CO \	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	H
CO2	H	M	M	H	H
CO3	H	H	M	M	M
CO4	M	H	H	H	M
CO5	H	H	M	M	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. E. Rama Devi	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	MCA	
Course Code:	20PMC318	Title	Batch :	2020
		Cloud Computing	Semester	III
Hrs/Week:	4		Credits:	4

Course Objective

- Analyze the components of cloud computing showing how business agility in an organization can be created
- Evaluate the deployment of web services from cloud architecture
- Critique the consistency of services deployed from a cloud architecture
- Compare and contrast the economic benefits delivered by various cloud models based on application requirements, economic constraints and business requirements.
- Critically analyze case studies to derive the best practice model to apply when developing and deploying cloud based applications

Course Outcomes (CO)

K1	CO1	To remember the powerful features of android
K2	CO2	To get the idea of Designing and developing User Interfaces for the Android platform.
K3	CO3	To implement and configure Android app development tools
K4	CO4	To analyze user interfaces for the android platform
K5	CO5	Apply suitable virtualization concept

Syllabus

Unit I

CLOUD COMPUTING FUNDAMENTALS: Cloud Computing definition, private, public and hybrid cloud. Cloud types; IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public vs private clouds, role of virtualization in enabling the cloud; Business Agility: Benefits and challenges to Cloud architecture. Application availability, performance, security and disaster recovery; next generation Cloud Applications.

10 Hours

Unit II

CLOUD APPLICATIONS: Technologies and the processes required when deploying web services; deploying a web service from inside and outside a cloud architecture, advantages and disadvantages.

10 Hours

Unit III

MANAGEMENT OF CLOUD SERVICES: Reliability, availability and security of services deployed from the cloud. Performance and scalability of services, tools and technologies used to manage cloud services deployment; Cloud Economics : Cloud Computing infrastructures

available for implementing cloud based services. Economics of choosing a Cloud platform for an organization, based on application requirements, economic constraints and business needs (e.g Amazon, Microsoft and Google, Salesforce.com, Ubuntu and Redhat)

12 Hours

Unit IV

APPLICATION DEVELOPMENT: Service creation environments to develop cloud based applications. Development environments for service development; Amazon, Azure, Google App.

10 Hours

Unit V

CLOUD IT MODEL: Analysis of Case Studies when deciding to adopt cloud computing architecture. How to decide if the cloud is right for your requirements. Cloud based service, applications and development platform deployment so as to improve the total cost of ownership (TCO).

10 Hours

Text Books:

- GautamShroff, “Enterprise Cloud Computing Technology Architecture Applications”, Cambridge University Press; 1 edition, [ISBN: 978-0521137355], 2010.

References Books:

- Toby Velte, Anthony Velte, Robert Elsenpeter, “Cloud Computing, A Practical Approach” McGraw-Hill Osborne Media; 1 edition [ISBN: 0071626948], 2009.
- Dimitris N. Chorafas, “Cloud Computing Strategies” CRC Press; 1 edition [ISBN: 1439834539],2010.

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	H	H
CO2	H	M	M	M	H
CO3	H	M	M	H	M
CO4	M	H	H	H	M
CO5	M	M	H	M	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. M. Rathamani	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	MCA	
Course Code:	20PMC319	Title	Batch :	2020
		Lab –V Programming in Open Source Technologies	Semester	III
Hrs/Week:	4		Credits:	2

Course Objective

- To familiarize students with the Linux environment
- To learn the fundamentals of shell scripting/programming
- To familiarize students with basic linux administration

Course Outcomes (CO)

K3	CO1	To understand Linux library functions , communication facility and system calls
K4	CO2	To deploy shell programming in Linux systems
K5	CO3	To analyze various administrative task in Linux environment

Program -1	File Related commands
Program -2	Directory related commands
Program -3	Shortest Job First algorithm
Program -4	Round Robin scheduling algorithm
Program -5	FIFO Algorithm
Program -6	Dead Lock detection algorithm
Program -7	Paging
Program -8	Segmentation
Program -9	DOS Commands
Program -10	Command Line Arguments

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	M	H	L	H
CO3	L	L	L	M	L
CO4	M	L	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. S. Niraimathi	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	MCA	
Course Code:	20PMC320	Title	Batch :	2020
		Lab VI Programming in R Tool	Semester	III
Hrs/Week:	4		Credits:	2

Course Objective

- To understand the practical knowledge of data mining concepts
- Enable the students to write and execute the program
- Knowledge of R Studio

Course Outcomes (CO)(for Practicals Only)

K3	CO1	To understand the concept of Data Mining and Big Data
K4	CO2	To get the practical knowledge of Data Mining
K5	CO3	Enable the students to write the Data Mining Programs using R

Program -1	Implement Apriori algorithm to extract association rule of data mining
Program -2	Implement k-means clustering technique
Program -3	Implement any one Hierarchal Clustering
Program -4	Implement Classification algorithm
Program -5	Implement Decision Tree
Program -6	Linear Regression
Program -7	Data Visualization

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	H	H
CO2	H	M	M	M	H
CO3	H	M	M	H	M
CO4	M	H	H	H	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. E. Rama Devi	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC321	Title	Batch :	2020
		Mini project	Semester	III
Hrs/Week:			Credits:	2
External : 30 Marks		Internal 20 Marks		Total : 50 Marks

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. S. Niraimathi	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Semester IV

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC422	Title	Batch :	2020
		Internet of Things	Semester	IV
Hrs/Week:	4		Credits:	4

Course Objectives

- On successful completion of the course, the student will:
- Understand the concepts of Internet of Things
- Analyze basic protocols in wireless sensor network
- Design IoT applications in different domain and be able to analyze their performance
- Implement basic IoT applications on embedded platform

Course Outcomes (CO)

K1	CO1	Able to understand building blocks of Internet of Things and characteristics.
K2	CO2	Identify the permutations and combinations
K3	CO3	Apply Inverse Laplace transform to different applications
K4	CO4	Able to understand the application areas of IOT
K5	CO5	Apply the Set theory and Relation concepts

Syllabus

Unit I

Introduction to IoT: Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs. **10 Hours**

Unit II

IoT & M2M: Machine to Machine, Difference between IoT and M2M, Software define Network. **10 Hours**

Unit III

Network & Communication aspects: Wireless medium access issues, MAC protocol survey, Survey routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination. **12 Hours**

Unit IV

Challenges in IoT: Design challenges, Development challenges, Security challenges, Other challenges. **10 Hours**

Unit V

Domain specific applications of IoT: Home automation, Industry applications, Surveillance applications, Other IoT applications. **10 Hours**

Text Books

- Vijay Madiseti, Arshdeep Bahga, “Internet of Things: A Hands-On Approach”

Reference Books:

- Waltenegus Dargie, Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice"

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	H	H
CO2	H	M	M	M	H
CO3	H	M	M	H	M
CO4	M	H	H	H	M
CO5	M	M	H	M	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. M. Rathamani	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC423	Title	Batch :	2020
		Artificial Intelligence and Machine Learning	Semester	IV
Hrs/Week:	4		Credits:	4

Course Objective

- Introduction to AI Problems
- Knowledge of Heuristic techniques
- Representing Simple facts and learning.
- Learning the concepts of AI and Machine Learning

Course Outcomes (CO)

K1	CO1	Understanding the AI Problems
K2	CO2	Get the knowledge of Heuristics Technique
K3	CO3	Representing Simple facts and learning.
K4	CO4	Learning the concepts of AI and Machine Learning
K5	CO5	Case studies on machine learning

Unit I

Introduction: AI Problems - Criteria for success. Problems, Problem Spaces, Search: State space search - Production Systems - Problem Characteristics –Production system characteristics - Issues in design of Search.

10 Hours

Unit II

Heuristic Search techniques: Generate and Test - Hill Climbing- Best-First, Problem Reduction, Constraint Satisfaction, Means-end analysis.

10 Hours

Unit III

Knowledge representation issues: Representations and mappings -Approaches to Knowledge representations -Issues in Knowledge representations - Frame Problem.

Using Predicate logic: Representing simple facts in logic - Representing Instance and Isa relationships - Computable functions and predicates - Resolution - Natural deduction.

10 Hours

Unit IV

Understanding Machine Learning: Machine Learning – Defining Big Data – Big Data in context with Machine Learning – Need to understand and trust the data – Importance of the hybrid cloud – Leveraging the power of Machine Learning – Roles of statistics and data mining with machine learning – Putting machine learning in context – Approaches to machine learning

10 Hours

Unit V

Looking inside machine learning : Impact of machine learning on Applications – Data Preparation – Machine Learning Cycle . Learning Machine Learning Skills – Using Machine Learning to Provide Solutions to Business Problems - Ten Predictions on the future of Machine Learning

10 Hours

Text Books :

- Elaine Rich and Kevin Knight," Artificial Intelligence", Tata McGraw Hill Publishers company Pvt Ltd, Third Edition..
- Judith Hurwitz and Daniel Kirsch " Machine Learning ", IBM Limited Edition 2018

Reference Books :

- Tom M. Mitchell, “Machine Learning “,Tata McGraw Hill Publishers company Pvt Ltd,

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	H
CO2	H	M	M	H	H
CO3	H	H	M	M	M
CO4	M	H	H	H	M
CO5	H	M	M	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. E. Rama Devi	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC424	Title	Batch :	2020
		Online Certification (Swayam/NPTEL/CISCO/SUN/Microsoft/RedHat etc..)	Semester	IV
Hrs/Week:			Credits:	1

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. M. Rathamani	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

Programme code:	MCA	Programme Title :	Master of Computer Applications	
Course Code:	20PMC425	Title	Batch :	2020
		Project and Viva voce	Semester	IV
Hrs/Week:			Credits:	5

Course Designed by	Verified by HoD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Dr. S. Niraimathi	Dr. M. Rajasenathipathi	Mr. K. Srinivasan	Dr. R. Muthukumaran
Signature:	Signature:	Signature:	Signature:

**PG DEPARTMENT OF COMPUTER APPLICATIONS
VALUE ADDED COURSE SYLLABUS - 2020-2023**

**PC ASSEMBLY & CCTV INSTALLATION
SUBJECT CODE: 20PMCVA1**

Objective of the Course:

This course enables the students to understand the fundamentals of PC Assembly and CCTV Installation

Learning Outcomes:

- Assemble/setup and upgrade personal computer systems
- Diagnose and isolate faulty components
- Optimize system performance
- Install and connect peripherals
- Knowledge of CCTV components
- Installation of CCTV

Expected Job Roles

Service Technician for PC and CCTV camera

Duration of the course

30 Hours

Outline of the Course

Unit – I

Computer Components – Computer Tools – Computer Case Preparation - Mother Board -
Installing a CPU - Installing a Computer Memory 4 hours

Unit – II

Installing a Mother Board - Installing a Power Supply - Computer Wiring - Installing a Hard
Drive – DVD Drive 4 hours

Unit – III

Installing a Graphics Card – Booting the computer – Install Drivers – Installing Windows 7
and 10 – Trouble Shooting – Case Study
6 hours

Unit – IV

Electronic Surveillance : Objective - Introduction to Electronic Surveillance - Introducing CCTV
- CCTV Technology - Designing of the CCTV System: Objective - Pre-Installation Activities -
Customer Requirements and Site Analysis - Selection of Components 8 hours

Unit - V

CCTV Camera Installation: Objective - Planning for CCTV Camera Installation - Installing the
Camera - Checking the Camera Functions - Set Up CCTV Surveillance System: Objective -
Connecting Camera and DVR with System - Configuring Network Settings - Checking the
Functioning of the System 8 hours

Material for Study

- <https://www.build-your-own-computer.net/support-files/build-your-own-computer.pdf>
- CCTV Installation Technician – National Skill Development Corporation – Facilitator Guide
- <https://nsdcindia.org/sites/default/files/FG-ELEQ4605-CCTV-Installation-Technician-09-03-2018.pdf>
- <https://www.instructables.com/id/How-To-Assemble-A-Basic-Desktop-PC/>
- <https://choosemympc.net/assemblyguide/>
- http://ptgmedia.pearsoncmg.com/images/9781587132636/samplechapter/9781587132636_ch03.pdf
- http://www.uobabylon.edu.iq/eprints/publication_3_27197_1357.pdf