JSS MAHAVIDYAPEETHA

JSS UNIVERSITY, NOIDA

EVALUATION SCHEME AND SYLLABUS

For

Master of Computer Applications (MCA)

First Year

Effective from the Session

2024-2025

JSS UNIVERSITY, NOIDA

C-20/1, Sector-62, Noida, Gautam Budh Nagar,
Uttar Pradesh, India-201301.

Master of Computer Applications (MCA) First Year

SEMESTER I

Sl. No	Course Code	Course Title	Teaching hours / week				Credits	Marks			Exam Duration
			L	T	P	Total		CIE	ESE	Total	
1	JCA 101	Fundamentals of Mathematics for Computer Applications	3	0	0	3	3	40	60	100	3 hrs
2	JCA 102	Programming and Data Structures using C	3	0	2	5	4	40	60	100	3 hrs
3	JCA 103	Python Programming	3	0	2	5	4	40	60	100	3 hrs
4	JCA 104	Database Management System	3	0	2	5	4	40	60	100	3 hrs
5	JCA 105	Operating System with Linux	3	0	0	3	3	40	60	100	3 hrs
6	JCA 106	Communication & Social Skills for Professional Development	2	0	0	2	2	40	60	100	2 hrs
7	JCA 107	Human Values and Ethics	2	0	0	2	2	40	60	100	2 hrs
						25	**22**	**280**	**420**	**700**	

Master of Computer Applications (MCA) First Year

SEMESTER II

Sl. No	Course Code	Course Title	Teaching hours / week				Credits	Marks			Exam Duration
			L	T	P	Total		CIE	ESE	Total	
1	JCA 201	Object Oriented Programming using Java	3	0	2	5	4	40	60	100	3 hrs
2	JCA 202	Software Engineering	4	0	0	4	4	40	60	100	3hrs
3	JCA 203	Advance Design and Analysis of Algorithms	3	0	2	5	4	40	60	100	3hrs
4	JCA 204	Web Development	3	0	2	5	4	40	60	100	3hrs
5	JCA 205	Computer Network	4	0	0	4	4	40	60	100	3hrs
6	JCA 206	Cyber Security	3	0	0	3	3	40	60	100	3hrs
7	JCA 207	Entrepreneurship & Business Basics	2	0	0	2	2	40	60	100	2hrs
						28	**25**	**280**	**420**	**700**	

DETAILED SYLLABUS

for

Master of Computer Applications (MCA) First Year

First Semester

Effective from the Session

2024-2025

JCA101 FUNDAMENTALS OF MATHEMATICS FOR COMPUTER APPLICATIONS

Course Outcomes

CO1: Apply the fundamentals of set theory and matrices for the given problem.
CO2: Solve the given problem by applying the Mathematical logic concepts
CO3: Discuss relations, functions, and pigeonhole principle in the context of discrete mathematics.
CO4: Illustrate the techniques of Graph theory and its applications.
CO5: Apply the types of distribution, evaluate the mean and variance for the given case study/ problem.

UNITS	Syllabus	No of Hours
Unit – I	**Linear Systems and Matrices:** Complex matrices, Hermitian, Skew-Hermitian, Unitary matrices, Elementary transformation, Inverse of a matrix, Echelon forms, Rank of matrix, Solution of linear systems, Characteristic equation, Cayley-Hamilton theorem, Eigenvalues and eigenvectors	**08 Hrs**
Unit – II	**Set Theory :** Sets, Operations on sets, Cardinality of sets, inclusion-exclusion principle, pigeonhole principle. **Relations:** Relations and Their Properties, n-ary Relations and Their Application, Representing Relations, Closures of Relations, Equivalence Relations, Partial Orderings	**06 Hrs**
Unit – III	**Mathematical Logic:** Propositional Logic, Applications of Propositional Logic, Propositional Equivalences Predicates and Quantifiers, Nested Quantifiers, Rules of Inference Introduction to Proofs	**08 Hrs**
Unit – IV	**Graph Theory:** Graphs and Graphs models, Graph Terminology and Special Types of Graphs, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamilton Paths, Shortest-Path Problems, Planar Graphs, Graph Coloring	**06 Hrs**
Unit – V	**Random variable and probability distribution:** Concept of random variable, discrete probability distributions, continuous probability distributions, Mean, variance and co-variance and co-variance of random variables. Binomial and normal distribution, Exponential and normal distribution with mean and variables and problems	**08 Hrs**

Text Books

1. Kenneth H Rosen, "Discrete Mathematics and its Applications", McGraw Hill publications, 7th edition. (Chapters 2.1,2.2,2.5, 2.6,6.2,8.5,8.6,10.1 to 10.8)
2. Wolpole Myers Ye "Probability and Statistics for engineers and Scientist" Pearson Education, 8th edition.
3. Chandrasekharaiah. D. S, "Discrete Mathematical Structures", PRISM Pvt.Ltd, 4 th Edition, 2012.
4. Chandrasekharaiah. D. S, "Graph Theory and combinatories", PRISM Books Pvt.Ltd,2008.

Reference Books

1.Richard A Johnson and C.B Gupta "Probability and statistics for engineers" Pearson Education.
2. J.K Sharma "Discrete Mathematics", Mac Millian Publishers India, 3rd edition,2011.

Web Resources

1. http://www.math.kent.edu/~zvavitch/GTC_2020.html
2. https://www.tutorialspoint.com/discrete_mathematics/index.htm
3. https://www.tutorialsduniya.com/notes/probability-theory-statistics-notes/
4.https://www.khanacademy.org/math/algebras-home/alg-basic-eq-ineq/alg-old- schoolequations/v/algebra-linear-equations-1

JCA102 PROGRAMMING AND DATA STRUCTURES USING C

Course Outcomes

CO1: Able to apply the knowledge of basic concepts of C Programming
CO2: Utilize structures pointers, dynamic memory allocation to enhance the functionality and efficiency of C programs and Apply the knowledge of basics of data structures.
CO3: Apply the knowledge of various Linear and its Applications.
CO4: Analyze the various complex data structures like Hash table & linked list along with Its applications.
CO5: Illustrate classical algorithms and Non-linear data structures.

UNITS	Syllabus	No of Hours
Unit I	**Basics of C:** Structure of a C program,, Data Types, operators, Input and Output operations, Decision Making and Branching, Looping statements. **Arrays:** Initialization, Declaration, One dimensional and Two-dimensional arrays. Strings- String operations.	**8 Hrs**
Unit II	**Functions and Pointers:** Basics and passing parameters to functions and pointers, Recursion, Dynamic Memory Allocation, Structures- Defining Structure, Passing Structures to Functions, Pointer to Structure. **Basics of Data Structures and Algorithms:** Basics of Algorithms, Analyzing algorithms, Growth of Functions Asymptotic notations, Types of data structures.	**8 Hrs**
Unit III	**Stack:** Definition, Array representation, Prefix, Infix and Postfix expressions, conversion of these expressions from one to another. **Queue:** Definition, Types of queues: Simple queue, Circular queue, Double ended queue, Priority queue.	**8Hrs**
Unit IV	**Linked List:** Inserting and Removing nodes from a list, singly linked List, Doubly Linked List, Linked list Implementation of Stack and queue, Hash Table , Hash Functions.	**06 Hrs**
Unit V	**Graphs:** Introduction to Graph, Graph Traversal Techniques. **Trees:** Types of Trees, Binary Tree, Representation of Binary trees using arrays and lists, Binary tree traversals, Binary search trees.	**06 Hrs**

PROGRAMMING AND DATA STRUCTURES USING C PRACTICALS

Preamble: The objective of the course is to introduce the basic ideas and concepts of C programming language and Data Structure. This will help students to design and implement real world problem solutions using different Data Structure approaches concepts.

List of experiments

1. Programs to learn and explore C data types, looping and decision making structures.
2. Program to Calculate the salary of an employee given his basic pay, HRA = 10%of basic pay, TA=5% of his basic pay and deductions IT = 2.5% of his basic pay.
3. Program to Solve quadratic equations to find the roots of the equation.
4. Program to implement arrays and structures. {Ex: Students marks calculation, matrix operations}

5. Program to Calculate the average marks of the student test marks and display the result using structure.
6. Implementation of Stack using Array.
7. Implementation of Queue using Array.
8. Implementation of Circular Queue using Array.
9. Implementation of Stack using Linked List.
10. Implementation of Queue using Linked List.
11. Implementation of Circular Queue using Linked List.
12. Implementation of Tree Structures, Binary Tree, Tree Traversal, Binary Search Tree, Insertion and Deletion in BST

Text Books

1. Computer Concepts and Programming in C, E Balaguruswami, McGraw Hill.
2. Lipschutz, "Data Structures" Schaum's Outline Series, Tata McGraw-hill Education (India) Pvt. Ltd.
3. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publications Pvt Ltd Delhi India.

Reference Book

1. Thareja, "Data Structure Using C" Oxford Higher Education.
2. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein, "Data Structures Using C and C++", PHI Learning Private Limited, Delhi India.
3. Michael T. Goodrich, Roberto Tamassia, David M. Mount "Data Structures and Algorithms in C++",
4. Wiley India. P. S. Deshpandey, "C and Data structure", Wiley Dreamtech Publication.
5. Cracking the Coding Interview",GayleLaakmannMcDowell,Career Cup.

Web Resources

1. https://nptel.ac.in/courses/106102064
2. https://onlinecourses.swayam2.ac.in/cec19_cs04/preview
3. https://www.coursera.org/learn/data-structures
4. https://www.my-mooc.com/en/categorie/algorithms-and-data-structures

JCA103 PYTHON PROGRAMMING

Course Outcomes

CO1: Apply the syntax of Python Programming Language.
CO2: Implement various mutable and immutable data structures.
CO3: Demonstrate Python functions to facilitate code reuse and manipulate strings.
CO4: Demonstrate the use of built-in functions to navigate the file system.
CO5: Apply python packages and libraries.

UNITS	Syllabus	No of Hours
Unit I	**Introduction to Python Basics** : Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program. **Python Program Flow Control Conditional blocks**: if, else and else if, Simple for loops in python, For loop using ranges, string, list and dictionaries. Use of while loops in python, Loop manipulation using pass, continue, break and else. Programming using Python conditional and loop blocks.	**06 Hrs**
Unit II	**Python Complex data types:** Using string data type and string operations, Defining list and list slicing, Use of Tuple data type, String, List, Set and Dictionary, Manipulations Building blocks of python programs, string manipulation methods, List manipulation. Dictionary manipulation, Programming using string, list and dictionary in-built functions.	**06 Hrs**
Unit III	**Functions:** Def Statements with Parameters, Return Values and return Statements, The None Value, Keyword Arguments and print(), Local and Global Scope, Introduction to functional programming and Lamda function , map, filter and reduce , Iterator and Generator in Python, Exception Handling.	**06 Hrs**
Unit IV	**Python File Operations**: Reading files, Writing files in python, Understanding read functions, read(), readline(), readlines(). Understanding write functions, write() and writelines() Manipulating file pointer using seek Programming, using file operations.	**06 Hrs**

PYTHON PROGRAMMING PRACTICALS

Preamble: The objective of the course is to introduce the basic ideas and concepts of programming using Python as a basic language. This will help students to design and implement cross- platform programming concepts as well.

List of experiments

1. Execution of expressions involving arithmetic, relational, logical, and bitwise operators.
2. Write a python program for the following:
 a) to read a number and display corresponding day using if_elif_else?

b) to compute the GCD of two numbers

c) to print first n prime numbers

3. Write a python program to demonstrate the looping mechanism like while loop, For loop and nested loops.

4. Write a python program to perform Matrix Addition and Multiplication

5. Write a python program merge sort.

6. Write a python program Linear and Binary search

7. Write a Python function to produce the outputs such as:

a)
```
    *
   * * *
 * * * * *
  * * *
    *
```

b)
```
    1
  232
34543
4567654
 567898765
```

8. Create a list and perform the following methods:

a) Insert ()

b) remove ()

c)append ()

d) len ()

e) pop()

f)clear()

9. Create a dictionary and apply the following methods

a) Print the dictionary items

b) access items

c) useget ()

d) change values

e) use len ()

10. Write a program to create a menu with the following options.

a) to perform addition

b) to perform subtraction

c) to perform multiplication

d) to perform division

Accepts users input and perform the operation accordingly. Use functions with arguments.

11. Write a program to find sum of the numbers for the elements of the list by using reduce ()?

12. Write a program for map () function to double all the items in the list?

13. Write a Python function that takes a string as an input from the user and determines whether

it is palindrome or not.
14. Write a Python function that takes a string as an input from the user and displays its reverse.
15. Write a Python program to use a lambda function for adding 4 numbers.
16. Write a python program to print date, time using date and time functions
17. Write a python program which accepts the radius of a circle from user and computes the area (use math module)
18. Write a python program to create a package (Engg), subpackage (years), modules (sem) and create staff and student function to module.
19. Using a numpy module create array and check the following:
a) List with type float
b) 3*4 array with all zeros
c) From tuple
d) Random values
20. Using a numpy module create an array and check the following:
a) Type of array
b) Axes of array
c) Shape of array
d) Type of elements in array.
21. Write a function that reads a file file1 and displays the number of words and the number of vowels in the file.
22.Write a Python function that copies the content of one file to another.

Text books

1.Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.
2. John V Guttag, —Introduction to Computation and Programming Using Python‘‘, Revised and expanded Edition, MIT Press , 2013

Reference Books

1.Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist‘‘, 2nd edition, Updated for Python 3, Shroff/O‘Reilly Publishers, 2016
2. Robert Sedgewick, Kevin Wayne, Robert Dondero, —Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
3. Timothy A. Budd, —Exploring Python‖, Mc-Graw Hill Education (India) Private Ltd.2015.
4. Kenneth A. Lambert, —Fundamentals of Python: First Programs‖, CENGAGE Learning, 2012.
5. Charles Dierbach, —Introduction to Computer Science using Python: A Computational Problem Solving Focus, Wiley India Edition, 2013.
6. Paul Gries, Jennifer Campbell and Jason Montojo, —Practical Programming: An Introduction to Computer Science using Python 3‖, Second edition, Pragmatic Programmers, LLC, 2013

Web Resource

1. https://programming-24.mooc.fi/
2. https://www.my-mooc.com/en/mooc/python-programming-essentials
3. https://onlinecourses.nptel.ac.in/noc24_cs57/preview
4. https://onlinecourses.swayam2.ac.in/cec22_cs20/preview

JCA104 DATABASE MANAGEMENT SYSTEM

Course Outcomes

CO1: Explain the basic concepts of data models, modeling notations and database management system.
CO2: Design of database and development of ER –Models.
CO3: Implementation of SQL queries.
CO4: Implementation of Advanced SQL and explore relational query language.
CO5: Design and build a simple database system and explore different normal forms.

UNITS	Syllabus	No of Hours
Unit – I	**Introduction**: Database-System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Design, Data Storage and Querying, Transaction Management, Database Architecture, Data Mining and Information Retrieval, Specialty Databases, Database Users and Administrators, History of Database Systems. **Introduction to the Relational Model:** Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages.	**8 Hrs**
Unit – II	**Database Design and the E-R Model:** Overview of the Design Process, The Entity Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues, Extended E-R Features, Other Aspects of Database Design	**8 Hrs**
Unit – III	**Introduction to SQL:** Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Sub queries, Modification of the Database. **Intermediate SQL:** Join Expressions, Views, Transactions, Integrity Constraints, SQL Data Types and Schemas.	**8 Hrs**
Unit – IV	**Advanced SQL**: Accessing SQL from a Programming Language, Functions and Procedures, Triggers, Recursive Queries, Advanced Aggregation Features, OLAP. Formal **Relational Query Languages:** The Relational Algebra, The Tuple Relational Calculus	**6 Hrs**
Unit – V	**Relational Database Design**: Features of Good Relational Design, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Functional Dependency Theory, Algorithm for Decomposition, Decomposition Using Multivalued Dependencies, More Normal Forms, Database-Design Process. Basics of DB2 objects Db2's structure and functions, Comparison of Oracle & DB2.	**6 Hrs**
DATABASE MANAGEMENT SYSTEM PRACTICALS		
Preamble: The objective of the course is to enable learners Design database schema for a given		

application. Working on database systems, designing of database, creating relational databases and analysis of table design. Acquire skills in using SQL commands for data definition and data manipulation.
List of experiments
1. Creating Entity-Relationship Diagram using case tools. 2. Writing SQL statements Using ORACLE /MYSQL: a)Writing basic SQL SELECT statements. b) Restricting and sorting data. c)Displaying data from multiple tables. d)Aggregating data using group function. e)Manipulating data f)Creating and managing tables. 3. Normalization 4. Creating cursor 5. Creating procedure and functions 6. Creating packages and triggers 7. Design and implementation of payroll processing system 8. Design and implementation of Library Information System 9. Design and implementation of Student Information System 10. Automatic Backup of Files and Recovery of Files 11. Mini project (Design & Development of Data and Application) for following : a) Inventory Control System. b) Material Requirement Processing. c) Hospital Management System. d) Railway Reservation System. e) Personal Information System. f) Web Based User Identification System. g) Timetable Management System. h) Hotel Management System

Text Books

1. A. Silberschatz, Henry.F.Korth, S.Sudharshan, "Database System Concepts", 7th Edition,2013

Reference Books

1. Raghu Ramakrishnan and J Gehrke," Database Management Systems", 3rd Edition, 2014.
2. C.J.Date, AKannan, S..Swamynathan ,"An Introduction to Database System", 8th Edition,2004.
3. RamezElmasri, Shamkant.B.Navathe, "Database Systems", 7th Edition,2016.

Web Resources

1. www.tutorialspoint.com/sql/sql-rdbms-concepts.htm
2. nptel.ac.in/courses/106106093/6
3. msdis.missouri.edu/resources/gis_advanced/pdf/relational.pdf

JCA105 OPERATING SYSTEMS WITH LINUX

Course Outcomes

CO1. Describe the basic principles adopted in the design of modern operating systems.
CO2. Explain the objective and functions of modern operating systems.
CO3. Describe how computing resources are used by application software and managed by system software.
CO4. Design and implement the concepts of shell programming.
CO5. Implement the various filters of LINUX.

UNITS	Syllabus	No of Hours
Unit – I	**Operating System concepts:** Types of Operating Systems, Operating System Components & Services, System calls. **Process Management:** Process Concept, Process Scheduling, Threads, CPU Scheduling Criteria, Scheduling algorithm. The Critical Section Problem, Semaphores, Classical problems of synchronization, Monitors.	**08 Hrs**
Unit – II	**Deadlocks** – system model, Characterization, Dead lock prevention, avoidance and detection, Recovery from dead lock. **Memory Management**: Logical and Physical address space, Swapping, Contiguous allocation, Paging, Segmentation, Segmentation with paging, Virtual memory -Demand paging and its performance, Page replacement algorithms, Allocation of frames, Thrashing.	**08 Hrs**
Unit – III	**FILE SYSTEM**: Concept of a file, access methods, directory structure, file system mounting, file sharing, protection. File system implementation: file system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance.	**08 Hrs**
Unit – IV	I/**O SYSTEM**: Mass storage structure - overview of mass storage structure, disk structure, disk attachment, disk scheduling algorithms, swap space management, stable storage implementation, tertiary storage structure.	**06 Hrs**
Unit – V	**Introduction and interacting with shell and Desktop to Linux**: History, salient features, Linux system architecture, Linux command format, Linux internal and external commands, Directory commands, File related commands, Disk related commands. The Linux Shell Basic command cls, cat, cal, date, calendar, who, printf, tty, sty, uname, passwd, echo, tput, bc, script, spell and ispell, Introduction to Shell Scripting, Shell Scripts, read, Command Line Arguments, Exit Status of a Command.	**06 Hrs**

Text Books

1. Abraham Silberschatz And Peter Baer Galvin, “Operating System Concepts”, 8th Edition, Pearson Education, 2002.
2. M.G.Venkateshmurthy , “Introduction To Unix & Shell Programming”, First Edition, Pearson Education, 2004.
3. Richard Petersen, “The Complete Reference Linux “, Sixth Edition Petersen, Tata Mcgraw Hill [Chapter 1]
4. Kernighan B W & Robert B, “The Unix Programming Environment”.

Reference Books

1. Harvey M. Deital, “Operating Systems”, Third Edition, Pearson Education, 2004.
2. William Stallings, Operating Systems, Prentice Hall.
3. Daniel P. Bovet, Marco Cesati,”Understanding The Linux Kernel(O'Reilly) “
4. William Bo Rothwell ,”Linux for Developers: Jumpstart Your Linux Programming Skills
5. Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, “Linux in a Nutshell”, O'Reilly Media, 6th Ed., 2009.
6. Neil Matthew, Richard Stones, Alan Cox, “Beginning Linux Programming”, 3rd Ed., 2004.

JCA106 COMMUNICATION & SOCIAL SKILLS FOR PROFESSIONAL DEVELOPMENT

Course Outcomes

CO1: Explain the qualities of technical communication and explore to remove its barriers.
CO2: Apply modern technology for improvement of Communication.
CO3: Analyze the effective presentation strategies using various tool.
CO4: Explore the basic concepts of ethics in business world and Informational technology.
CO5: Practice and acquire ethics as IT Professionals and users.

UNITS	Syllabus	No of Hours
Unit – I	**Introduction**: Introduction, Process of Communication, Language as a Tool, Levels of Communication, Communication Networks, Importance of Technical Communication. Definition of Noise, re housing in strategic Decision Making.	**05 Hrs**
Unit – II	**Impact of Technology**: Impact of Technology, Software for Creating Messages, Software for Writing Documents, Software for Presenting Documents, Transmitting Documents.	**05 Hrs**
Unit – III	**Effective Presentation Effective Presentation:** Introduction, Defining purpose, Analyzing Audience and Locale, Organizing Contents, preparing outline, Visual Aids, Kinesics, Proxemics, Paralinguistic, Chronemics, Sample speech.	**05 Hrs**
Unit – IV	**Ethics Introduction**: What are Ethics: Definition of ethics, Importance of Integrity, Ethics in the Business world.	**05 Hrs**
Unit – V	**Professional Ethics** - IT Professionals & Users Professional, The ethics behavior of IT professionals, IT users: Supporting the ethical practices of IT users.	**05 Hrs**

Text Books

1. Meenakshi Raman and Sangeeta Sharma,Technical Communication - Principles and Practices, Oxford University Press, 2015.
2. George Reynolds, Ethics in Information Technology, CENAGE Learning, 2014

Reference Books

1. Mike W Martin and Roland Schinzinger, Ethics in Engineering, Tata McGraw Hill Edition 2007
2. M.AshrafRizivi, Effective Technical Communication, Tata McGraw Hill, 2009

Web Resources

1. www.coursehero.com.
2. www.studocu.com.
3.http://www2.ece.ohio-state.edu/~passino/ee481.html.

JCA107 HUMAN VALUES AND ETHICS

Course Outcome:

CO1: Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society

CO2: . Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body.

CO3: Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society.

CO4: Understand the harmony in nature and existence, and work out their mutually fulfilling participation in the nature.

UNITS	Syllabus	No of Hours
Unit I	**Course Introduction -** Need, Basic Guidelines, Content and Process for Value Education Understanding the need, basic guidelines, content and process for Value Education, Self-Exploration–what is it? - its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration, Continuous Happiness and Prosperity- A look at basic Human Aspirations, Right understanding, Relationship and Physical Facilities.	**05 Hrs**
Unit II	**Understanding Harmony in the Human Being:** Harmony in Myself Understanding human being as a co-existence of the sentient 'I' and the material 'Body', Understanding the needs of Self ('I') and 'Body' - Sukh and Suvidha, Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer), Understanding the characteristics and activities of 'I' and harmony in 'I', Understanding the harmony of I with the Body: Sanyam and Swasthya.	**05 Hrs**
Unit III	**Understanding Harmony in the Family and Society:** Harmony in Human-Human Relationship Understanding harmony in the Family- the basic unit of human interaction , Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship, Understanding the meaning of Vishwas; Difference between intention and competence, Understanding the meaning of Samman.	**05 Hrs**
Unit IV	**Understanding Harmony in the Nature and Existence :** Whole existence as Co-existence Understanding the harmony in the Nature, Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature, Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space, Holistic perception of harmony at all levels of existence	**05 Hrs**

Text Books

R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.

Reference Books

1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and Harper Collins, USA
2. E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.
3. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
4. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth Club of Rome's report, Universe Books.

DETAILED SYLLABUS

for

Master of Computer Applications (MCA) First Year

Second Semester

Effective from the Session

2024-2025

JCA 201 OBJECT ORIENTED PROGRAMMING USING JAVA

Course Outcomes

CO1: Develop the object-oriented programming concepts using Java
CO2: Implement exception handling, file handling, and multi-threading in Java
CO3: Apply new java features to build java programs.
CO4: Analyse java programs with Collection Framework
CO5: Test web and Restful Web Services with Spring Boot using Spring Framework concepts

UNITS	Syllabus	No of Hours
Unit – I	**Introduction:** Why Java, History of Java, JVM, JRE, Java Environment, Java Source File Structure, and Compilation. Fundamental, Programming Structures in Java: Defining Classes in Java, Constructors, Methods, Access Specifies, Static Members, Final Members, Comments, Data types, Variables, Operators, Control Flow, Arrays & String. Object Oriented Programming: Class, Object, Inheritance Super Class, Sub Class, Overriding, Overloading, Encapsulation, Polymorphism, Abstraction, Interfaces, and Abstract Class. Packages: Defining Package, CLASSPATH Setting for Packages, Making JAR Files for Library Packages, Import and Static Import Naming Convention For Packages	**08 Hrs**
Unit – II	**Exception Handling:** The Idea behind Exception, Exceptions & Errors, Types of Exception, Control Flow in Exceptions, JVM Reaction to Exceptions, Use of try, catch, finally, throw, throws in Exception Handling, In-built and User Defined Exceptions, Checked and Un-Checked Exceptions. Input /Output Basics: Byte Streams and Character Streams, Reading and Writing File in Java. Multithreading: Thread, Thread Life Cycle, Creating Threads, Thread Priorities, Synchronizing Threads, Inter-thread Communication.	**06 Hrs**
Unit – III	**Java New Features:** Functional Interfaces, Lambda Expression, Method References, Stream API, Default Methods, Static Method, Base64 Encode and Decode, ForEach Method, Try-withresources, Type Annotations, Repeating Annotations, Java Module System, Diamond Syntax with Inner Anonymous Class, Local Variable Type Inference, Switch Expressions, Yield Keyword, Text Blocks, Records, Sealed Classes.	**06 Hrs**
Unit – IV	**Java Collections Framework:** Collection in Java, Collection Framework in Java, Hierarchy of Collection Framework, Iterator Interface, Collection Interface, List Interface, ArrayList, Linked List, Vector, Stack, Queue Interface, Set Interface, HashSet, Linked HashSet, SortedSet Interface, Tree Set, Map Interface, Hash Map Class, Linked HashMap Class, TreeMap Class, Hashtable Class, Sorting, Comparable Interface, Comparator Interface, Properties Class in Java.	**08 Hrs**

Unit – V	**Spring Framework:** Spring Core Basics-Spring Dependency Injection concepts, Spring Inversion of Control, AOP, Bean Scopes- Singleton, Prototype, Request, Session, Application, Web Socket, Auto wiring, Annotations, Life Cycle Call backs, Bean Configuration styles Spring Boot: Spring Boot Build Systems, Spring Boot Code Structure, Spring Boot Runners, Logger, BUILDING RESTFUL WEB SERVICES, Rest Controller, Request Mapping, Request Body, Path Variable, Request Parameter, GET, POST, PUT, DELETE APIs, Build Web Applications	**08 Hrs**

OBJECT ORIENTED PROGRAMMING USING JAVA PRACTICAL

Preamble: The objective of the course is to apply new java features in java programs with collection frame work and apply Restful Web Services with Spring Boot using Spring Framework concepts.

List of experiments

1. Use Java compiler and eclipse platform to write and execute java program.
2. Creating simple java programs using command line arguments
3. Understand OOP concepts and basics of Java programming.
4. Create Java programs using inheritance and polymorphism.
5. Implement error-handling techniques using exception handling and multithreading.
6. Create java program with the use of java packages.
7. Construct java program using Java I/O package.
8. Create industry oriented application using Spring Framework.
9. Test RESTful web services using Spring Boot.
10. Test Frontend web application with Spring Boot

Text Books

1. Herbert Schildt, Java – The Complete Reference, 9th Edition. McGraw Hill Education (India) Edition-2014.
2. Jim Keogh, J2EE The Complete Reference, Tata McGraw Hill Education Private Limited-2011.

Reference Books

1. Java 8 Programming Black Book, Dreamtech Press-2012
2. Timothy Budd, "Understanding Object-Oriented programming with Java", Updated Edition Pearson Education, 2000.

Web Resources

1. http://www.javaworld.com/
2. http://www.oracle.com/technetwork/java/index-jsp-135888.html
3. http://www.learnjavaonline.org/
4. http://www.javaworld.com/article/2074929/core-java.

JCA 202 SOFTWARE ENGINEERING

Course Outcome:

CO1: Explain various software characteristics and analyze different software Development Models

CO2: Demonstrate the contents of a SRS and apply basic software quality assurance practices to ensure that design, development meet or exceed applicable standards

CO3: Compare and contrast various methods for software design.

CO4: Formulate testing strategy for software systems, employ techniques such as unit testing, Test driven development and functional testing

CO5: Manage software development process independently as well as in teams and make use of Various software management tools for development, maintenance and analysis.

UNITS	Syllabus	No of Hours
Unit – I	**Introduction:** Introduction to Software Engineering, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes. Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models.	**08 Hrs**
Unit – II	**Software Requirement Specifications (SRS):** Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modelling, Data Flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, IEEE Standards for SRS. Software Quality Assurance (SQA): Verification and Validation, SQA Plans, Software Quality Frameworks, ISO 9000 Models, SEI-CMM Model.	**08 Hrs**
Unit – III	**Software Design:** Basic Concept of Software Design, Architectural Design, Low Level Design: Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, Design Strategies: Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design. Software Measurement and Metrics: Various Size Oriented Measures: Halestead's Software Science, Function Point (FP) Based Measures, Cyclomatic Complexity Measures: Control Flow Graphs.	**08 Hrs**
Unit – IV	**Software Testing:** Testing Objectives, Unit Testing, Integration Testing, Acceptance Testing, Regression Testing, Testing for Functionality and Testing for Performance, TopDown and BottomUp Testing Strategies: Test Drivers and Test Stubs, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Test Data Suit Preparation, Alpha and Beta Testing of Products. Static Testing Strategies: Formal Technical Reviews (Peer Reviews), Walk Through, Code Inspection, Compliance with Design and Coding Standards.	**08 Hrs**
Unit – V	**Software Maintenance and Software Project Management**: Software as an Evolutionary Entity, Need for Maintenance, Categories of Maintenance:	**08 Hrs**

	Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re- Engineering, Reverse Engineering. Software Configuration Management Activities, Change Control Process, Software Version Control, An Overview of CASE Tools. Estimation of Various Parameters such as Cost, Efforts, Schedule/Duration, Constructive Cost Models (COCOMO), Resource Allocation Models, Software Risk Analysis and Management.	

Text Books:

1. R S Pressman, "Software Engineering: A Practitioners Approach", McGraw Hill.
2. Pankaj Jalote, "Software Engineering", Wiley
3. Rajib Mall, "Fundamentals of Software Engineering", PHI Publication.
4. K K Aggarwal and Yogesh Singh, "Software Engineering", New Age International Publishers.

Reference Books:

1. Ian Sommerville: Software Engineering, 9th Edition, Pearson Education Ltd, 2011
2. MichelBlaha, James Rumbaugh: Object-Oriented Modelling and Design with UML, 2nd edition, Pearson, 2007.

Web Resources:

1. www.allaboutagile.com/what-is-agile-10-key-principles/
2. https://www.versionone.com/agile

JCA 203 ADVANCE DESIGN AND ANALYSIS OF ALGORITHMS

Course Outcome:

CO1: Design new algorithms, prove them correct, and analyze their asymptotic and absolute runtime and memory demands.

CO2: Find an algorithm to solve the problem (create) and prove that the algorithm solves the problem correctly (validate).

CO3: Understand the mathematical criterion for deciding whether an algorithm is efficient, and know many practically important problems that do not admit any efficient algorithms.

CO4: Apply classical sorting, searching, optimization and graph algorithms.

CO5: Understand basic techniques for designing algorithms, including the techniques of recursion, divide-and-conquer, and greedy.

UNITS	Syllabus	No of Hours
Unit – I	**Introduction**: Algorithms, Analyzing algorithms, Complexity of algorithms, Growth of functions, Performance measurements, Sorting and order Statistics - Shell sort, Quick sort, Merge sort, Heap sort, Comparison of sorting algorithms, Sorting in linear time.	**08 Hrs**
Unit – II	**Advanced Data Structures**: Red-Black trees, B – trees, Binomial Heaps, Fibonacci Heaps, Tries, skip list	**06 Hrs**

Unit – III	**Divide and Conquer** with Examples such as Sorting, Matrix Multiplication, Convex hull and Searching. **Greedy methods** with Examples such as Optimal Reliability Allocation, Knapsack, Minimum Spanning trees – Prim's and Kruskal's algorithms, Single source shortest paths - Dijkstra's and Bellman Ford algorithms	**08 Hrs**
Unit – IV	**Dynamic Programming** with Examples such as Knapsack. All pair shortest paths – Warshal's and Floyd's algorithms, Resource allocation problem. Backtracking, Branch and Bound with examples such as Travelling Salesman Problem, Graph Coloring, n-Queen Problem, Hamiltonian Cycles and Sum of subsets.	**08 Hrs**
Unit – IV	**Selected Topics**: Algebraic Computation, Fast Fourier Transform, String Matching, Theory of NP-completeness, Approximation algorithms and Randomized algorithms.	**06 Hrs**
ADVANCE DESIGN AND ANALYSIS OF ALGORITHMS PRACTICAL		
Preamble: The objective of the course is to apply classical sorting, searching, optimization and graph implement and design the techniques of recursion, divide-and-conquer, and greedy.		
List of experiments		
1. Program for Recursive Binary & Linear Search. 2. Program for Heap Sort. 3. Program for Merge Sort. 4. Program for Selection Sort. 5. Program for Insertion Sort. 6. Program for Quick Sort. 7. Knapsack Problem using Greedy Solution 8. Perform Travelling Salesman Problem 9. Find Minimum Spanning Tree using Kruskal's Algorithm 10. Implement N Queen Problem using Backtracking		

Text Books:

1. Anany Levitin, Introduction to The Design and Analysis of Algorithms, 3rd Edition, Pearson Education, 2012.

2. T. H Cormen, C E Leiserson, R L Rivest and C Stein: Introduction to Algorithms, 3rd Edition, Prentice-Hall of India, 2009.

3. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, Fundamentals of Computer Algorithms, 2nd Edition, University press, 2014.

Reference Books:

1. Kenneth A. Berman, Jerome L. Paul: Algorithms, Cengage Learning, 2002.

2. Haralambos Marmanis and Dmitry Babenko, Algorithms of the Intelligent Web, Manning Publications, 2009.

Web Resources:

1. https://www.classcentral.com/course/nptel-design-and-analysis-of-algorithms-3984

2.https://ocw.mit.edu/courses/6-854j-advanced-algorithms-fall-2008/pages/study-materials/

JCA 204 WEB DEVELOPMENT

Course Outcome:

CO1: Understand the fundamental concepts of web development, including the history, protocols, and tools. Apply HTML and XML in the development of web projects.

CO2: Apply CSS for designing and styling web pages, including the use of CSS properties, styling elements, and advanced techniques for creating responsive web sites.

CO3: Develop interactive web applications using JavaScript and AJAX, with a focus on scripting documents, forms, and networking concepts such as internet addressing and TCP/IP sockets.

CO4: Design and implement server-side applications using Enterprise Java Beans (EJB) and Node.js, including the creation of JavaBeans, RESTful APIs, and database operations with MongoDB.

CO5:Implement web server functionality using Servlets and Java Server Pages(JSP), focusing on handling HTTP requests, session tracking, and utilizing custom tag libraries for dynamic web content.

UNITS	Syllabus	No of Hours
Unit I	**Introduction:** Introduction and Web Development Strategies, History of Web and Internet, Protocols Governing Web, Writing Web Projects, Connecting to Internet, Introduction to Internet services and tools, Introduction to client-server computing. **Web Page Designing:** HTML: List, Table, Images, Frames, forms, XML: Document type definition (DTD), XML schemes, Object Models, presenting and using XML, Using XML Processors: DOM and SAX.	**08 Hrs**
Unit II	**CSS:** Creating Style Sheet, CSS Properties, CSS Styling (Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, Box Model (Introduction, Border properties, Padding Properties, Margin properties) **CSS Advanced** (Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector), CSS Color, Creating page Layout and Site Designs.	**08 Hrs**
Unit III	**Scripting: Java script:** Introduction, documents, forms, statements, functions, objects, introduction to AJAX. **Networking:** Internet Addressing, InetAddress, Factory Methods, Instance Methods, TCP/IP Client Sockets, URL, URL Connection, TCP/IP Server Sockets, and Datagram.	**08 Hrs**
Unit IV	**Enterprise Java Bean:** Creating a JavaBeans,JavaBeans Properties, Types of beans, Stateful Session bean, Stateless Session bean, Entity bean. Node.js: Introduction, Environment Setup, REPL Terminal, NPM (Node Package Manager) Callbacks Concept, Events, Packaging, Express Framework, Restful API. **Node.js with MongoDB:** MongoDB Create Database, Create Collection, Insert, delete, update, join, sort, query.	**08 Hrs**
Unit V	**Servlets:** Servlet Overview and Architecture, Interface Servlet and the Servlet Life Cycle, Handling HTTP get Requests, Handling HTTP post Requests, Redirecting Requests to Other Resources, Session Tracking, Cookies, Session Tracking with Http Session **Java Server Pages (JSP):** Introduction, Java Server Pages Overview, A First Java Server Page Example, Implicit Objects, Scripting, Standard Actions, Directives, Custom Tag Libraries.	**08 Hrs**

WEB DEVELOPMENT PRACTICAL
Preamble: The objective of the course is to Analyze a web page and identify its elements and attributes. Create dynamic web pages using XHTML and Cascading Style Sheets and JavaScript. Build dynamic web pages using JavaScript (Client-side programming). Create XML documents and Schemas.
List of experiments
1. Write HTML program for designing your institute website. Display departmental information of your institute on the website. 2. Write HTML program to design an entry form for student details/employee information/faculty details. 3. Develop a responsive website using CSS and HTML. Website may be for tutorial/blogs/commercial website. 4. Write programs using HTML and Java Script for validation of input data. 5. Write a program in XML for creation of DTD, which specifies set of rules. Create a style sheet in CSS/ XSL & display the document in internet explorer. 6. Create a Java Bean for Employee information (EmpID, Name, Salary, Designation and Department). 7. Build a command-line utility using Node.js that performs a specific task, such as converting text to uppercase, calculating the factorial of a number, or generating random passwords. 8. Develop a script that uses MongoDB's aggregation framework to perform operations like grouping, filtering, and sorting. For instance, aggregate user data to find the average age of users in different cities. 9. Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servlet for doing the following: a. Create a Cookie and add these four user id's and passwords to this Cookie. b. Read the user id and passwords entered in the Login form and authenticate with the values available in the cookies. 10. Create a table which should contain at least the following fields: name, password, email-id, phone number Write Servlet/JSP to connect to that database and extract data from the tables and display them. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page. 11. Write a JSP which insert the details of the 3 or 4 users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user name and password from the database. 12. Design and implement a simple shopping cart example with session tracking API.

Text Books:

1. Christopher Murphy, Richardclark, OliStudholme, DivysManian, "Beginning HTML5 and CSS3", Apress Publication,2012.
2. Grant, Andrew, "Beginning AngularJS", Apress Publication,2014.
3. Matt Doyle, "Beginning PHP 5.3", Wiley Publisher,2010.

Reference Books:

Chris Bates, "Web Programming Building Internet Applications", Wiley India, 3 rd Edition, 2007

Web Resources:

1. https://www.w3schools.com/html/
2. https://www.w3schools.com/w3css/defaulT.asp
3.https://careerfoundry.com/en/tutorials/web-development-for-beginners/introduction-toweb-development/

JCA 205 COMPUTER NETWORKS

Course Outcome:

CO1: Explain basic concepts, OSI reference model, services and role of each layer of OSI model and TCP/IP, networks devices and transmission media, Analog and digital data transmission

CO2: Apply channel allocation, framing, error and flow control techniques.

CO3: Describe the functions of Network Layer i.e. Logical addressing, sub netting & Routing Mechanism.

CO4: Explain the different Transport Layer function i.e. Port addressing, Connection Management, Error control and Flow control mechanism

CO5: Explain the functions offered by session and presentation layer and their Implementation**.**

UNITS	Syllabus	No of Hours
Unit I	**Introductory Concepts:** Goals and applications of networks, Categories of networks, Organization of the Internet, ISP, Network structure and architecture (layering principles, services, protocols and standards), The OSI reference model, TCP/IP protocol suite, Network devices and components. **Physical Layer:** Network topology design, Types of connections, Transmission media, Signal transmission and encoding, Network performance and transmission impairments, Switching techniques and multiplexing.	**08 Hrs**
Unit II	**Link layer:** Framing, Error Detection and Correction, Flow control (Elementary Data Link Protocols, Sliding Window protocols). Medium Access Control and Local Area Networks: Channel allocation, Multiple access protocols, LAN standards, Link layer switches & bridges (learning bridge and spanning tree algorithms).	**08 Hrs**
Unit III	**Network Layer:** Point-to-point networks, Logical addressing, Basic internetworking (IP, CIDR, ARP, RARP, DHCP, ICMP), Routing, forwarding and delivery, Static and dynamic routing, Routing algorithms and protocols, Congestion control algorithms, IPv6.	**08 Hrs**
Unit IV	**Transport Layer:** Process-to-process delivery, Transport layer protocols (UDP and TCP), Multiplexing, Connection management, Flow control and retransmission, Window management, TCP Congestion control, Quality of service.	**08 Hrs**
Unit V	**Application Layer:** Domain Name System, World Wide Web and Hyper Text Transfer Protocol, Electronic mail, File Transfer Protocol, Remote login, Network management, Data compression, Cryptography – basic concepts.	**08 Hrs**

OBJECT ORIENTED PROGRAMMING USING C++ PRACTICALS

Preamble: The objective of the course is to introduce the basic ideas and concepts of Object Oriented Programming using C++. This will help students to design and implement real world problem solutions using classes and different object oriented programming approaches

List of experiments

1. Write a C++ program to generate the first n terms of the sequence.
2. Write a C++ program to generate all the prime numbers between 1 and n, where n is a value

supplied by the user.

3. Write a C++ program to find both the largest and smallest number in a list of integers.
4. Write a Program to illustrate New and Delete Keywords for dynamic memory allocation
5. Write a program Illustrating Class Declarations, Definition, and Accessing Class Member
6. Program to illustrate default constructor, parameterized constructor and copy constructors.
7. Write a Program to Demonstrate the i) Operator Overloading ii) Function Overloading.
8. Write a Program to Demonstrate Friend Function and Friend Class.
9. Write a Program to Access Members of a STUDENT Class Using Pointer to Object Members.
10. Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are: a) Reading a matrix. b) Addition of matrices. c) Printing a matrix. d) Subtraction of matrices. e) Multiplication of matrices.
11. Write a Program to illustrate New and Delete Keywords for dynamic memory allocation
12. Write a program Illustrating Class Declarations, Definition, and Accessing Class Members.
13. Write a Program to illustrate default constructor, parameterized constructor and copy constructors.
14. Write C++ programs that illustrate how the following forms of inheritance are supported: a) Single inheritance b) Multiple inheritance c) Multi level inheritance d) Hierarchical inheritance.

Text Books:

1. B. A. Forouzan, "Data Communications and Networking", 5th Edition, McGraw Hill Education (India) Private Limited, 2016.
2. William Stallings, "Cryptography and Network Security", 7th Edition, Pearson, 2018

Reference Books:

1. William Stallings, Data and Computer Communications, 10th Edition, Pearson, 2015.
2. Andrew S. Tanenbaum, Computer Networks, Fourth Edition, PHI, 2014.
3. Behrouz A. Forouzan, "Cryptography and Network Security", Tata McGraw-Hill Publishing, 2010.

Web Resources:

1. www.nptel.ac.in/courses
2. http://freevideolectures.com/Course/2276/Computer-Networks
3. williamstallings.com/Extras/Security-Notes/.
4. www.cs.bilkent.edu.tr/~selcuk/teaching/cs519/.
5. http://freevideolectures.com/Course/3027/Cryptography-and-Network-Security

JCA 206 CYBER SECURITY

Course Outcome:

CO1: Apply IT ACT (Cyber law) to the given case/problem and infer from the given case and analyze the gap if exists.

CO2: Analyze the working of cyber security principles in designing the system.

CO3: Analyze the given problem (cybercrime, vulnerability, threat), develop a strategy (physical, logical or administrative controls) to mitigate the problem and articulate consequences on Society and National Economy.

CO4: Examine relevant network defence / web application tool to solve given cyber security problem and evaluate its suitability.

CO5: Evaluate provisions available in Indian cyber law to handle infringement of intellectual property rights that happens on the cyber platform.

UNITS	Syllabus	No of Hours
Unit – I	**Introduction:** to security attacks, services and mechanism, Classical encryption techniques substitution ciphers and transposition ciphers, cryptanalysis, steganography, Stream and block ciphers. Modern Block Ciphers: Block ciphers principles, Shannon's theory of confusion and diffusion, fiestal structure, Data encryption standard (DES), Strength of DES, Idea of differential cryptanalysis, block cipher modes of operations, Triple DES.	**06 Hrs**
Unit – II	**Introduction to Cybercrime and Laws Introduction, Cybercrime**: Definition and Origins of the word, Cybercrime and information Security, Who are Cybercriminals? Classifications of Cyber crimes. How Criminals Plan Them – Introduction, How Criminals Plan the Attacks, Cyber café and Cyber crimes, Botnets, Attack Vector, The Indian IT ACT 2000 and amendments.	**06 Hrs**
Unit – III	**Phishing and Identity Theft Introduction, Phishing** – Methods of Phishing, Phishing Techniques, Phishing Toolkits and Spy Phishing. Identity Theft – PII, Types of Identity Theft, Techniques of ID Theft. Digital Forensics Science, Need for Computer Cyber forensics and Digital Evidence, Digital Forensics Life Cycle.	**06 Hrs**
Unit – IV	**Cybercrime:** Mobile and Wireless devices, Introduction, proliferation of mobile and wireless devices, Trends in Mobility, credit card frauds in Mobile and wireless computing,	**06 Hrs**
Unit – V	**Network Defense tools and block chain technology Firewalls and Packet Filters:** Firewall Basics, Packet Filter Vs Firewall, How a Firewall Protects a Network, Packet Characteristic to Filter, Stateless Vs Stateful Firewalls, Network Address Translation (NAT) and Port Forwarding, the basic of Virtual Private Networks.	**06 Hrs**

Text Book

1. Anti-Hacker Tool Kit (Indian Edition) by Mike Shema, Publication McGraw Hill.
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Nina.

Reference Books

1. Marjie T. Britz - Computer Forensics and Cyber Crime: An Introduction - Pearson
2. Chwan-Hwa (John) Wu,J. David Irwin - Introduction to Computer Networks and Cyber securityCRCPress
3. Bill Nelson, Amelia Phillips, Christopher Steuart - Guide to Computer Forensics and InvestigationsCengage Learning

JCA 207 ENTREPRENEURSHIP &BUSINESS BASICS

Course Outcome:

CO1: Describe distinct entrepreneurial traits**.**

CO2: Recognize the process and nature of entrepreneurship.

CO3: Identify the different ways in which entrepreneurs manifest in start-ups.

CO4: Comprehend the entrepreneurial process for initiating new venture creation**.**

UNITS	Syllabus	No of Hours
Unit – I	Concept and Definitions Entrepreneurship, Traits and Qualities of Entrepreneurs, Entrepreneurship process; Theories of entrepreneurship; Factors affecting The emergence of entrepreneurship; Role of an entrepreneur in economic growth as an innovator.	**05 Hrs**
Unit – II	Classification and Types of Entrepreneurs: Social Entrepreneurship; Corporate Entrepreneurs, Family Business: Concept, structure, and kinds of family firms; Culture and evolution of family firm; Managing Business, Industry Types:-Primary-Secondary-Tertiary.	**05 Hrs**
Unit – III	Resources mobilization, types of resources, Process of resource mobilization, Arrangement offends, Traditional sources of financing, Venture capital, Angel investors, Business Incubators. Benefits of E- Business. Limitations of E-Business:- Meaning of online transaction and Types of On-line payment mechanism.	**05 Hrs**
Unit – IV	Difference between Private Company and Public Company, Role of Sole Trading Company and Partnership Firm, Distinguish between Partnership Co-operative society and Joint Stock Companies. Fundamentals of Startup culture and Entrepreneurs ship, Lifecycle of startup an funding option.	**05 Hrs**

Text Books

1. Barringer, B.R., & Ireland, R.D. (2015). *Entrepreneurship*. Pearson.
2. Gersick, K. E., Davis, J. A., Hampton, M. M. & Lansberg, I. (1997). Generation to generation: Life cycles of the family business. Boston, United States: Harvard Business School Press.

Reference Books

1. Hisrich, R.D., Manimala, M.J., Peters, M.P., & Shepherd, D.A. (2013). Entrepreneurship. Delhi, India: Tata McGraw Hill.
2. Kuratko D.F., & Rao, T. V. (2012). Entrepreneurship: A South-Asian Perspective.
3. The 4- hour work week by Timothy Ferris.