Deccan Education Society's
FERGUSSON COLLEGE, PUNE
(AUTONOMOUS)

SYLLABUS UNDER AUTONOMY
FIRST YEAR M.Sc. (Computer Applications)

Deccan Education Society's
Fergusson College (Autonomous), Pune
Faculty of Science
Post Graduate Syllabus M.Sc. (Computer Applications)
First Year

Semester	Course Code	Title of the Course	Core / Elective	No. of Credits
I	CSA4101	Mathematical Foundation	CORE	4
	CSA4102	System Analysis and Design & UI Design	CORE	4
	CSA4103	Core Java	CORE	4
	CSA4104	Database Management Systems	CORE	4
	CSA4105	Practical - I (Based on Core Java)	PCORE	4
	CSA4106	Practical - II (Based on Databases)	PCORE	4
	CSA4107	Self Learning: 'C' Programming	CORE	1
II	CSA4201	Web Technologies	CORE	4
	CSA4202	Object Oriented Analysis and Design	CORE	4
	CSA4203	Advanced Java	CORE	4
	CSA4204	Data Mining and Data Warehousing	CORE	4
	CSA4205	Practical - I (Based on Web Technologies and Advanced Java)	PCORE	4
	CSA4206	Project using PHP or Java	PCORE	4
	CSA4207	Self Learning: Basics of LINUX	CORE	1
			TOTAL	**50**

Extra Credits

Semester	Course Code	Title of Course	No. of Credits
I	XHR0001	Human Rights - I	1
	XCS0002	Introduction to Cyber Security / Information Security - I	1
	XSD0003	Skill Development - I	1
II	XHR0004	Human Rights - II	1
	XCS0005	Introduction to Cyber Security / Information Security - II	1
	XSD0006	Skill Development - II	1
		TOTAL	**06**

Deccan Education Society's
Fergusson College (Autonomous), Pune
Faculty of Science
Post Graduate Syllabus M.Sc. (Computer Applications)
Second Year

Semester	Course Code	Title of the Course	Core / Elective	No. of Credits
III	CSA5301	Python Programming	CORE	4
	CSA5302	Mobile Technology	CORE	4
	CSA5303	Networking Concepts	ELECTIVE-I	4
	CSA5304	Software Testing	ELECTIVE-I	4
	CSA5305	Operating System	ELECTIVE-I	4
	CSA5306	Soft Computing	ELECTIVE-II	4
	CSA5307	Big Data Analytics	ELECTIVE-II	4
	CSA5308	Advanced Web Technologies	ELECTIVE-II	4
	CSA5309	Practical - I (Python Programming)	PCORE	4
	CSA5310	Project	PCORE	4
	CSA5311	Self Learning: DOT NET	CORE	1
Note: Students should choose one Elective subject out of the given Elective sets.				
IV	CSA5401	Internet of Things	CORE	4
	CSA5402	Information System Security	CORE	4
	CSA5403	Advanced Networking	ELECTIVE-III	4
	CSA5404	Cloud Computing	ELECTIVE-III	4
	CSA5405	Artificial Intelligence	ELECTIVE-III	4
	CSA5406	E-Commerce	ELECTIVE-IV	4
	CSA5407	Digital Image Processing	ELECTIVE-IV	4
	CSA5408	Machine Learning	ELECTIVE-IV	4
	CSA5409	Practical - I (Based on Internet of Things, Information System Security)	PCORE	4
	CSA5410	Project	PCORE	4
	CSA5411	Self Learning: Current Trends and Technologies (Umbrello)	CORE	1
Note: Students should choose one Elective subject out of the given Elective sets.				
			TOTAL	**50**

Extra Credits

Semester	Course Code	Title of Course	No. of Credits
III	XCS0007	Introduction to Cyber Security / Information Security-III	1
	XSD0008	Skill Development - III	1
IV	XCS0009	Introduction to Cyber Security / Information Security-IV	1
	XSD0010	Skill Development - IV	1
		TOTAL	**04**

Deccan Education Society's
FERGUSSON COLLEGE, PUNE
(AUTONOMOUS)

SYLLABUS UNDER AUTONOMY
FIRST YEAR M.Sc. (Computer Applications)
SEMESTER - I

(Academic Year 2018-2019)

M.Sc. (CA) SEMESTER - I
M.Sc. (CA) PAPER - I
TITLE: MATHEMATICAL FOUNDATION
PAPER CODE: CSA4101

[CREDITS - 4]

Learning Objective:
1.   To provide basic mathematical foundations required for various computer science courses.

	Title and Contents	**No. of Lectures**
Unit - I	**Sets, Relations and Functions** 1.1 Sets 1.2 Relations and functions 1.3 Methods of proof 1.4 Equivalence relations 1.5 Cardinality	**5**
Unit - II	**Introductory Logic** 1.1 Fundamentals of Logic 1.2 Logic operators such as AND, OR etc., Truth tables 1.3 Logical inferences 1.4 Methods of proofs of an implication 1.5 First order logic 1.6 Predicate calculus Predicates and Quantifiers 1.7 Rules of inference for quantified propositions	**7**
Unit - III	**Recurrence Relations** 3.1 Recursion 3.2 Forming and solving recurrence relations by substitution method and generating function 3.3 Method of characteristic roots 3.4 Solving non homogeneous recurrence relations	**7**
Unit - IV	**Theory of Graphs** 4.1 Graphs 4.2 Subgraphs 4.3 Isomorphism Proofs 4.4 Types of graphs 4.5 Paths and cycles 4.6 Adjacency matrices 4.7 Transitive closure 4.8 Connectivity 4.9 Directed acyclic graphs 4.10 Planar graphs and Euler's formula 4.11 Dual of a graph 4.12 Hamiltonian and Eulerian graphs 4.13 Applications like matching and colouring graphs 4.14 Graph traversals (BFS and DFS) 4.15 Trees 4.16 Spanning trees	**10**
Unit - V	**Probability and Random Vectors** 5.1 Introduction to regular expression to finite automata 5.2 Random vectors 5.3 Conditional Probability 5.4 Bayes Rule	**7**

	5.5 Multivariate Gaussian	
	5.6 Random Processes	
Unit - VI	**Basics of statistics** 6.1 Introduction to measure of central tendency and dispersion 6.2 Best linear unbiased estimator and weighted least-squares, maximum likelihood 6.3 Computing estimates: unconstrained optimization, stochastic gradient descent 6.4 Bayesian estimation 6.5 Hypothesis testing	**7**
Unit - VII	**Basics of Vector spaces** 7.1 Linear Vector spaces 7.2 Linear independence 7.3 Norms and Inner products 7.4 Bases and Orthobases 7.5 Examples: Bsplines, cosines / Fourier, radial basis Functions, etc. 7.6 Linear approximation (closest point in a subspace, Least squares - I)	**5**

References:
1. J. L. Mott, A. Kandel, T. P. Baker, Discrete Mathematics for Computer Scientists and Mathematicians: PHI.
2. John Truss, Discrete Mathematics for Computer Science: Pearson International, 2001.
3. Introduction to Discrete Mathematical Structures with Applications to Computer Science, McGraw Hill, 1975.
4. Liu, Computer Science: Mathematical Introduction: PHI.

M.Sc. (CA) SEMESTER - I
M.Sc. (CA) PAPER - II
TITLE: SYSTEM ANALYSIS AND DESIGN & UI DESIGN
PAPER CODE: CSA4102

[CREDITS - 4]

Learning Objectives:

1. To know the importance of System Development Life Cycle
2. To get the knowledge about CASE tools
3. To know about the system requirement specifications
4. To know about System Requirement Analysis
5. To identify and classify about Cost and Benefits

	Title and Contents	**No. of Lectures**
Unit - I	**Introduction**	**7**
	1.1 System	
	1.2 Types of Systems	
	1.3 System analysis fundamentals	
	1.4 System Analysis and Design	
	1.5 Roles of System Analysts	
	1.6 Business Systems Concepts	
	1.7 Systems Development Life Cycle	
	1.8 System Development Models	
	1.9 CASE tools and their Significance	
Unit - II	**System Study and Planning**	**8**
	2.1 Problem identification & Project Initiation	
	2.2 Introduction to Feasibility Study and its importance	
	2.3 Preparing Systems proposal	
	2.4 Presenting Systems proposal	
	2.5 Systems Planning Methodologies	
	2.6 Preliminary Investigation	
	2.7 Selecting Project Development Strategy	
Unit - III	**System Requirements and Analysis**	**15**
	3.1 Introduction	
	3.2 User requirements and System requirements	
	3.3 Fact Finding Techniques: Traditional, Modern & Radical Techniques	
	3.4 Tools and Techniques for Documenting Procedures	
	3.5 Structured Analysis & its components	
	3.6 Process Flow Strategy: Data Flow Diagram, Entity-Relationship diagram	
	3.7 Data Flow Strategy: Structured English, Decision Tables, Decision Trees	
	3.8 Data Dictionary	
Unit - IV	**System Design**	**10**
	4.1 Introduction	
	4.2 Design Goals and Objectives	
	4.3 Elements of Design	
	4.4 Relationship between System Analysis & Design	

	4.5 Input / Output Design including Online Dialogue and User Interface : Form design, Page layout, Visual Framework, Center Stage, Grid of Equals, Titled Sections, Module Tabs, Accordion, Collapsible Panels, Movable Panels , Right / Left Alignment, Diagonal Balance, Responsive Disclosure, Responsive Enabling Liquid Layout, Input Design, Forgiving Format, Structured Format, Fill-in-the-Blanks, Input Hints, Input Prompt, Password Strength Meter, Auto completion, Dropdown Chooser, List Builder, Good Defaults, Same-Page Error Messages, Mobile UI, Vertical Stack, Filmstrip, Touch Tools, Bottom Navigation, Thumbnail-and-Text List, Infinite List, Generous Borders, Text Clear Button, Loading Indicators, Richly Connected Apps, Streamlined Branding 4.6 Control / Procedures Design 4.7 Program Specification Design 4.8 Design and Documentation Tools 4.9 Design Specification	
Unit - V	**System Testing and Implementation** 5.1 Objectives 5.2 Types 5.3 Techniques 5.4 Installation User Training and Support	**8**

References:
1. J. A. Hoffer, J. F. George & J. S. Valacich, Modern Systems Analysis & Design, Pearson Education
2. James A. Senn, Analysis and Design of Information Systems, McGraw Hill International Edition, Second Edition
3. James A., Management Information Systems: Managing IT in the E-business Enterprise, Tata McGraw Hill
4. Kendall & Kendall, Systems Analysis and Design, PHI.

	M.Sc. (CA) SEMESTER - I M.Sc. (CA) PAPER - III TITLE: CORE JAVA PAPER CODE: CSA4103	
		[CREDITS - 4]
Learning Objectives: 1. To understand basic concepts of Java		
	Title and Contents	**No. of Lectures**
Unit - I	**Introduction to Java Language** 1.1 History and Evolution of Java 1.2 OOP Principles 1.3 Java Platform 1.4 JDK Environment 1.5 Java Tools 1.6 Java Byte Code	**2**
Unit - II	**Basic Programming Concepts** 2.1 Keywords 2.2 Data Types 2.3 Variables 2.4 Operators 2.5 Naming Conventions 2.6 Type Casting 2.7 Control Statements 2.8 Arrays	**4**
Unit - III	**Object Oriented Concepts of Java** 3.1 Introducing classes and objects 3.2 Constructors (All types) 3.3 Garbage Collection and finalize() method 3.4 Inheritance Basics 3.5 Types of Inheritance 3.6 Implementation of polymorphism : Method Overloading and Method Overriding 3.7 Nested and Inner classes 3.8 Modifiers and Access Control Specifiers 3.9 Final variables, methods and classes 3.10 Abstract methods and classes 3.11 Interfaces 3.12 Creating and Importing Packages 3.13 Exception Handling	**8**
Unit - IV	**Java Library** 4.1 String Handling: String Constructors, Special String Operations, Character Extraction, String Comparison, Searching Strings, Modifying a String, valueOf(), StringBuffer 4.2 Primitive Type Wrappers: Number, Double and Float, Byte, Short, Integer and Long, Character Boolean, Void	**10**

	4.3	Utility Classes (Only listed below): Math, StringTokenizer, Date, Calender, GregorianCalender, Random	
Unit - V	**Files and Streams**		**8**
	5.1	Exploring java.io package, File, Byte Streams	
	5.2	InputStream & OutputStream: FileInputStream & FileOutputStream, ByteArrayInputStream and ByteArrayOutputStream, DataInputStream & DataOutputStream	
	5.3	PrintStream	
	5.4	RandomAccessFile	
	5.5	Character Streams	
	5.6	Reader & Writer: FileReader & FileWriter, BufferedReader & BufferedWriter, CharArrayReader & CharArrayWriter	
	5.7	PrintWriter	
	5.8	Serialization	
	5.9	Serializable	
	5.10	ObjectInput & ObjectOutput: ObjectInputStream & ObjectOutputStream	
Unit - VI	**Applets, AWT and Event Handling**		**8**
	6.1	Applet Programming	
	6.2	Applet Basics	
	6.3	Applet Architecture	
	6.4	Applet Skeleton	
	6.5	update() and repaint()	
	6.6	HTML Applet Tag	
	6.7	Passing Parameters to an Applet Using Status Window	
	6.8	Introducing AWT: AWT classes, Windows Fundamentals, Working with Frame Windows Working with Graphics, Working with Colors and Fonts, AWT Controls, Layout Managers, Menus	
	6.9	Event Handling: Event Handling Mechanism, Delegation Event Model, Event Classes Event Listener Interfaces, Adapter Classes Anonymous Inner Classes	
Unit - VII	**Swing**		**6**
	7.1	Swing Features	
	7.2	Model View Controller Architecture for Swing, Components & Containers	
	7.3	Swing Controls: JApplet, JFrame, JButton, JCheckBox, JTextField, JTabbedPane, JInternalFrame, JScrollPane, JLabel, JList, JTree JTable, JDialog, JFileChooser, JProgressBar	
Unit - VIII	**Multithreaded Programming**		**2**
	8.1	Java Thread Model	
	8.2	The Main Thread	
	8.3	Creating a Thread Using isAlive() and join()	
	8.4	Thread Priorities	
	8.5	Thread Synchronization	
	8.6	Interthread Communication	
	8.7	Suspending, Resuming and Stopping Threads	

References:
1. Herbert Schildt, The Complete Reference - Seventh Edition
2. Horstman & Cornell, Core Java (Volume 1 - Fundamentals) Eighth Edition
3. Horstman & Cornell, Core Java (Volume 2 - Advanced Features) Eighth Edition
4. Balaguruswamy, Programming with Java
5. Java 7 Programming - Black Book, Kogent Learning Solutions Inc.

	M.Sc. (CA) SEMESTER - I **M.Sc. (CA) PAPER - IV** **TITLE: DATABASE MANAGEMEMENT SYSTEMS** **PAPER CODE: CSA4104** **[CREDITS - 4]**	

Learning Objectives:
1. To understand the difference between File system and Database system
2. To know basic E-R Concepts
3. To know the fundamentals of Normalization
4. To study basics and features of SQL

	Title and Contents	**No. of Lectures**
Unit - I	**Introduction to Database Systems** 1.1 Introduction 1.2 Basic Concepts and Definition: Data, Information, Data versus Information, Data Warehouse, Metadata, Data Item or Field, Records, Data Dictionary, Database, Database System 1.3 Database Users and Database Administrator 1.4 Functions and Responsibilities of DBA 1.5 File System versus Database System 1.6 View of Data 1.7 Database Languages 1.8 Schemas, Sub-schemas and Instances 1.9 3-Level Architecture: Internal Level, Conceptual Level, External Level 1.10 Data Independence: Physical Data Independence, Logical Data Independence 1.11 Structure of a DBMS 1.12 Functions of DBMS 1.13 Data Models	**4**
Unit - II	**Relational Model** 2.1 Introduction 2.2 Structure of Relational Database 2.3 Relational Algebra: Selection Operation, Projection Operation, Union Operation, Cartesian Product Operation, Difference Operation, Intersection Operation, Division Operation, Rename Operation, Join Operation	**6**
Unit - III	**Database and Relational Database Design** 3.1 Introduction 3.2 Basic E-R Concepts 3.3 Keys 3.4 Constraints 3.5 Entity Set 3.6 Strong Entity Set	**9**

		3.7 Weak Entity Set	
		3.8 E-R Diagram Symbol	
		3.9 E-R Diagram	
		3.10 Extended E-R Features	
		3.11 Conversion of E-R Model into Relations	
		3.12 Functional Dependency	
		3.13 Full Functional Dependency	
		3.14 Armstrong's Axioms	
		3.15 Redundant Functional Dependencies	
		3.16 Closure of a set of Functional Dependencies	
		3.17 Decomposition	
		3.18 Normalization	
		3.19 Normal Forms: First Normal Form, Second Normal Form, Third Normal Form, Boyce - Codd Normal Form (BCNF), Fourth Normal Form, Fifth Normal Form	
Unit - IV	**SQL**		**12**
		4.1 Introduction	
		4.2 Data definition	
		4.3 Basic structure of SQL queries	
		4.4 Data types	
		4.5 Integrity constraints	
		4.6 Set operations	
		4.7 Aggregate Functions	
		4.8 Null values	
		4.9 Nested sub-queries	
		4.10 Complex queries	
		4.11 Modification of database	
		4.12 Integrity and Security Constraints	
		4.13 Join relations	
		4.14 Stored Functions	
		4.15 Cursors	
		4.16 Triggers	
		4.17 Views	
		4.18 Security and Authorization	
		4.19 Embedded SQL	
		4.20 Dynamic SQL	
Unit - V	**Transaction Management**		**7**
		5.1 Transaction Concepts	
		5.2 Transaction Properties	
		5.3 Transaction States	
		5.4 Concurrent Execution	
		5.5 Serializability	
		5.6 Recoverability	
Unit - VI	**Concurrency Control & Database Recovery System**		**10**
		6.1 Introduction	
		6.2 Lock Based Protocols	
		6.3 Locks	

	6.4 Granting of Locks
	6.5 Two Phase Locking Protocol
	6.6 Time Stamp-Based Protocol
	6.7 Thomas Write Rule
	6.8 Multiple Granularity
	6.9 Deadlock Handling
	6.10 Database Recovery Concepts
	6.11 Types of Database Recovery
	6.12 Recovery Technique
	6.13 Deferred Update
	6.14 Immediate Update
	6.15 Buffer Management

References:
1. Abraham Silberschatz, Henry Korth, S. Sudarshan, ISBN: 9780071244763, Database Systems Concepts, Tata McGraw Hill
2. Raghu Ramakrishnan, Johannes Gehrke, ISBN: 9780072465631, Database Management Systems, Tata McGraw Hill
3. Date / Kanna, ISBN, 9788177585568, An Introduction to Database Systems, Pearson
4. Elmasri, Navathe, Fundamentals of Database Systems, Pearson Education
5. Singh, Database Systems: Concepts, Design and Applications, ISBN: 9788131760925, Pearson
6. Chakrabarti, Advanced Database Management system, ISBN: 9788177228021, Wiley India
7. O'Neil, Database-Principles, Programming and Performance, ISBN:9789380501284, Elsevier
8. Russell Dyer, MySQL Nutshell
9. Paul DuBois, MySQL Cookbook 3rd Edition, O'Reilly

M.Sc. (CA) SEMESTER - I
M.Sc. (CA) PAPER - V
TITLE: PRACTICAL-I (BASED ON CORE JAVA)
PAPER CODE: CSA4105

[CREDITS - 4]

Continuous Internal Assessment

1	Journal	10 Marks
2	Viva	
	Core Java	20 Marks
3	Internal test - for skill assessment	10 Marks
4	Attendance + Active Participation	10 Marks
	TOTAL	**50 Marks**
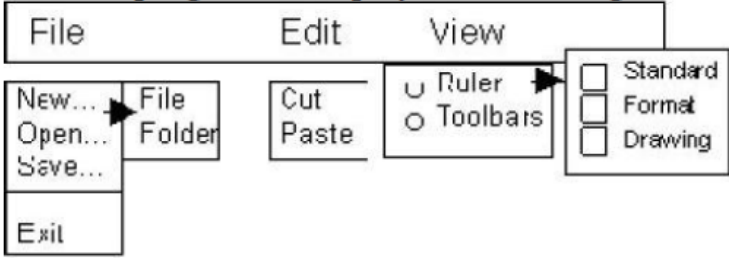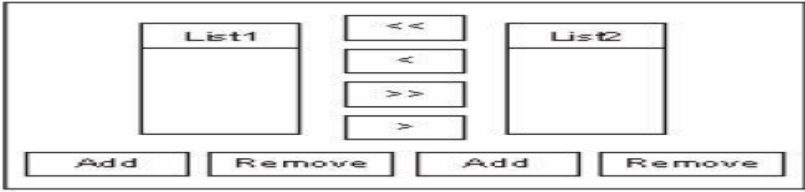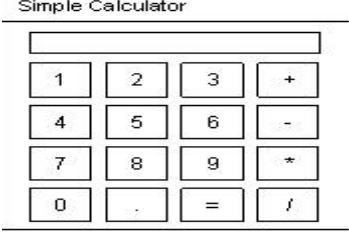
End Semester Assessment

1	Core Java Program1	15 Marks
2	Core Java Program2	25 Marks
3	Viva	10 Marks
	TOTAL	**50 Marks**

M.Sc. (CA) SEMESTER - I
M.Sc. (CA) PAPER - V
TITLE: PRACTICAL-I (BASED ON CORE JAVA)
PAPER CODE: CSA4105

[CREDITS - 4]

Sr. No.	Title of Experiment / Practical
1	Define a Employee class (name, position, salary). Define a default and parameterized constructor. Override the toString method. Keep a count objects created. Create objects using parameterized constructor and display the object count after each object is created. (Use static member and method). Also display the contents of each object
2	Write a program to create a Package "MCA_I" which has a class McaIMarks (members – SemITotal, SemIITotal). Create another package MCA_II which has a class McaIIMarks (members – SemITotal, SemIITotal). Create n objects of Student class (having rollNumber, name, McaIMarks and McaIIMarks). Add the marks of McaI and McaII calculate the Grade ('A' for >= 70, 'B' for >= 60 'C' for >= 50 , Pass Class for > =40 else 'FAIL') and display the result of the student in proper format.
3	Define an abstract class "car" with members reg_no, model, reg_date. Define two subclasses of this class – "transportVehicles " (validity_no, start_date, period) and "privateVehicle " (owner_name, owner_address). Define appropriate constructors. Create n objects which could be of either transportVehicles or privateVehicle class by asking the user's choice. Display details of all "privateVehicle" objects and all "transportVehicles" objects.
4	Create an interface "CreditCardInterface" with methods to viewCreditAmount,viewPin, changePin, useCard and payBalance. Create a class Customer (name, card number, pin, creditAmount – initialized to 0). Implement methods viewCreditAmount, viewPin, changePin and payBalance of the interface. From Customer, create classes RegularCardHolder (maxCreditLimit) and GoldCardHolder (String specialPrivileges) and define the remaining methods of the interface Create n objects of the RegularCardHolder and GoldCardHolder classes and write a menu driven program to perform the following actions: • Use Card • Pay Balance • Change Pin
5	Write a program to create a Package "MCA_I" which has a class McaIMarks (members - SemITotal, SemIITotal). Create another package MCA_II which has a class McaIIMarks (members - SemITotal, SemIITotal). Create n objects of Student class (having rollNumber, name, McaIMarks and McaIIMarks). Add the marks of McaI and McaII calculate the Grade ('A' for >= 70, 'B' for >= 60 'C' for >= 50 , Pass Class for > =40 else 'FAIL') and display the result of the student in proper format.

6	Write a menu driven program to perform the following operations on a binary file "item.dat" which contains id, name, price and quantity.
	1. Add an item 2. Search for an item. 3. Delete an item 4. Modify details of an item. 5. Display all items.
7	Write a program to display the following menus and sub-menus.
8	Write a program to create two lists and transfer elements from one list to another. Multiple selection is allowed. The Add button allows an element to be added and the Remove button allows an element to be removed (Accepted in an input dialog). Do not add duplicate elements.
9	Create an Applet which displays a message in the center of the screen. The message indicates the events taking place on the applet window. Handle events like mouse click, mouse moved, mouse dragged, mouse pressed, and key pressed. The message should update each time an event occurs. The message should give details of the event such as which mouse button was pressed, which key is pressed etc. (Hint: Use repaint(), KeyListener, MouseListener, MouseEvent method getButton, KeyEvent methods getKeyChar)
10	Create a calculator in an applet
11	Write a program to show how three thread manipulate same stack, two of them are pushing elements on the stack, while the third one is popping elements off the stack.

| 12 | Write a program to create a class called FileWatcher that can be given several filenames that may or may not exist. The class should start a thread for each file name. Each thread will periodically check for the existence of its file. If the file exists, the thread will write a message to the console and then end. |

M.Sc. (CA) SEMESTER - I
M.Sc. (CA) PAPER - VI
TITLE: PRACTICAL-II (BASED ON DATABASES)
PAPER CODE: CSA4106

[CREDITS - 4]

Continuous Internal Assessment

1	Journal	10 Marks
2	Viva	
	Database	20 Marks
3	Project	10 Marks
4	Attendance + Active Participation	10 Marks
	TOTAL	**50 Marks**

End Semester Assessment

1	Database Programs	25 Marks
2	Project Demo	15 Marks
3	Project Viva	10 Marks
	TOTAL	**50 Marks**

[CREDITS - 4]

Sr. No.	Title of Experiment / Practical
1	**Database Creation** *a) Bank Database* Consider the following database maintained by a Bank. The Bank maintains information about its branches, customers and their loan applications. Following are the tables: 1) branch (<u>bid</u> integer, brname char (30), brcity char (10)) 2) customer (<u>cno</u> integer, cname char (20), caddr char (35), city char(20)) 3) loan_application (<u>lno</u> integer, lamtrequired money, lamtapproved money, l_date date) 4) account (<u>acc_no</u> int , acc_type char(10) , acc_balance float(8,2)) The relationship is as follows: • customer-account : 1:M • customer-loan : 1:M • branch-loan: 1 :M • branch-account :1:M • customer-branch : M:1 *b) Railway Reservation Database* Consider a railway reservation Database of passengers. Passengers reserve berths of a bogie of trains. The bogie capacity of all the bogies of a train is same. 1) train (<u>train no</u> int, train_name varchar(20), depart_time time, arrival_time time, source_stn varchar(20) , dest_stn varchar(20), no_of_res_bogies int , bogie_capacity int) 2) passenger (<u>passenger_id</u> int, passenger_name varchar(20), address varchar(30), age int , gender char) Relationship is as follows: train _passenger : m-m with descriptive attributes as follows : 3) ticket (<u>train_no</u> int , passenger_id int, ticket_no int composite key, bogie_no int, no_of_berths int , date date , ticket_amt decimal(7,2),status char(10)) The status of a particular berth can be 'W' (waiting) or 'C' (confirmed).

2	**Queries**
	a) Using Bank Database
	1. Find out customer name having loan amt >10000
	2. List the names of the customers who have loan at _____branch.
	3. Find out the total loan amount sanctioned by "Houston "branch.
	b) Using Railway Reservation Database
	1. List the information about the availability of trains between "Mumbai" and "Pune".
	2. Give the names of all the trains which start from 'Pune'.
	3. Count no. of passengers for 'Duronto Express'
3	**Stored Functions**
	a) Using Bank Database
	1. Write a function that returns the total loan amount of a particular branch.
	2. Write a function to count the no. of customers of a particular branch.
	b) Using Railway Reservation Database
	1. Write a function which accepts train name and date as a input parameter and calculate total ticket amount for that train on the given date.
	2. Write a function to calculate total no of berths reserved for the train 'Jammutavi Express' on 2018-01-10.
4	**Cursors**
	a) Using Bank Database
	1. Write a procedure using cursor to display the customers having loan amounts between 45000 and 60000 from branch name 'MGROAD'.
	2. Write a procedure using cursor to add an interest of 4% to the balance of all accounts having balance > 7000.
	b) Railway Reservation Database
	1. Write a cursor to find the not confirmed bookings of all the trains on 18-05-2018.
	2. Write a cursor to find the total number of berths reserved for all the trains on _____.
5	**Triggers**
	a) Using Bank Database
	1. Write a trigger which will fire when account_no is less than 0 .
	2. Write a trigger which will fire before insert on the loan table to validate the loan approved amount must be less than the loan required amount.
	b) Using Railway Reservation Database
	1. Create a trigger to validate train arrival time must be less than train departure time.
	2. Write a trigger which will be activated before changing the status field in the ticket table.

6	**Views**
	a) Using Bank Database
	1. Create a view which contains all the customer details along with the details of all accounts of that customer.
	2. Create a view which contains details of all loans from the 'FC' branch.
	b) Using Railway Reservation Database
	1. Create a view containing the details of all the passengers who have booked a ticket for the 'Mumbai express' on 10/01/2018
	2. Create a view to list the passenger names whose ticket status is 'RAC' of 'Duronto' express' on date ——————————.
7	**Project**

M.Sc. (CA) SEMESTER - I
M.Sc. (CA) PAPER - VII
TITLE: SELF LEARNING: 'C' PROGRAMMING
PAPER CODE: CSA4107

[CREDITS - 1]

Learning Objectives:

1. Understand and develop programming concepts using C language

	Title and Contents	**Learning Hours**
Unit - I	**Introduction to C**	**3**
	1.1 Keywords	
	1.2 Identifiers	
	1.3 Variables	
	1.4 Constants – character, integer, float, string, escape sequences	
	1.5 Data types – built-in and user defined(enumerated)	
	1.6 Operators and Expressions	
	1.7 Operator Types (arithmetic, relational, logical, assignment, bitwise, conditional, other operators)	
	1.8 Operator precedence and Associativity rules	
Unit - II	**Control Structures**	**3**
	2.1 Decision making structures: if, if-else, switch	
	2.2 Loop Control structures: for, while, do...while	
	2.3 break, continue and goto	
Unit - III	**Functions**	**4**
	3.1 Introduction	
	3.2 Advantages of Functions	
	3.3 Standard library functions	
	3.4 User defined functions: Declaration, definition, function call, parameter passing (by value)	
	3.5 Return keyword	
	3.6 Scope of variables	
	3.7 Storage classes	
	3.8 Recursion	
Unit - IV	**Arrays**	**2**
	4.1 Array declaration, initialization	
	4.2 Types – one, two and multidimensional	
	4.3 Passing arrays to functions	
Unit - V	**Pointers**	**3**
	5.1 Pointer declaration	
	5.2 Pointer initialization	
	5.3 Dereferencing pointers	
	5.4 Pointer arithmetic	
	5.5 Pointer to pointer	

		5.6 Arrays and pointers	
		5.7 Functions and pointers: Passing pointers to Functions, Function returning pointers	
		5.8 Dynamic memory allocation	

Note: The evaluation is for 10 Marks based on above concepts.

References :
1. Brian W. Kernighan and Dennis M. Ritchie: The C programming language Second edition, Prentice Hall Publication
2. Behrouz A. Forouzan and Richard F. Gilberg: Computer Science A Structured programming approach using C Third edition, Thomson Course Technology Publication
3. Yashavant Kanetkar: Let Us C Seventh edition PBP Publications
4. E Balagurusamy: Programming in ANSI C Fourth edition TMH

Deccan Education Society's
FERGUSSON COLLEGE, PUNE
(AUTONOMOUS)

SYLLABUS UNDER AUTONOMY
FIRST YEAR M.Sc.(Computer Applications)
SEMESTER - II

(Academic Year 2018-2019)

M.Sc. (CA) SEMESTER - II
M.Sc. (CA) PAPER - I
TITLE: WEB TECHNOLOGIES
PAPER CODE: CSA4201

[CREDITS - 4]

Learning Objectives:
1. To understand basic concepts of PHP
2. To get familiarity of how to use processing forms
3. To gain the knowledge of storing information on server
4. To know the Object Oriented Concepts in PHP
5. To gain the knowledge of using PHP to access the database
6. To know the concept of using Graphics in PHP
7. To gain the knowledge of XML

	Title and Contents	**No. of Lectures**
Unit - I	**Introduction to Internet Programming** 1.1 Client-Server model 1.2 Browsers - Graphical and Hypertext Access to the Internet 1.3 HTTP - HyperText Transfer Protocol (how it actually works)	**2**
Unit - II	**Overview of Language Essentials** 2.1 Data Types 2.2 Variables 2.3 Embedding PHP into web pages 2.4 Functions 2.5 Arrays 2.6 Objects 2.7 Strings	**7**
Unit - III	**HTML forms processing** 3.1 Building a form 3.2 Text fields and value, size, maxlength, 3.3 HTML buttons 3.4 Radio buttons 3.5 Checkboxes 3.6 Selection lists 3.7 Introduction to CGI scripting Action and Method - GET and POST 3.8 Global variables 3.9 Reading files 3.10 File permissions 3.11 Uploading files 3.12 Reading from other Servers 3.13 Security: Filtering Input and Escaping Output	**10**
Unit - IV	**Web Techniques** 4.1 Server Information 4.2 Cookies 4.3 Sessions 4.4 Maintaining state	**5**

Unit - V	Databases	7
	5.1 Relational databases and SQL	
	5.2 Using PHP to access a database	
	5.3 Accessing Databases	
	5.4 PEAR DB Basics	
Unit - VI	XML	7
	6.1 Introduction	
	6.2 PHP and XML	
	6.3 Functions in XML	
	6.4 The Simple XML extension	
	6.5 Loading XML Document into a SimpleXML Object	
	6.6 Looping through an Element	
	6.7 Use SimpleXML Element Constructor	
	6.8 Looping over all Elements and its Attributes	
	6.9 Recursively processing XML Document	
	6.10 Parsing XML	
Unit - VII	Graphics	7
	7.1 Basic concepts	
	7.2 GD extensions	
	7.3 Creating and drawing images	
	7.4 Images with text	
	7.5 Scaling images	
	7.6 Color handling	
	7.7 Embedding an image into page	
Unit - VIII	E-mail via scripts	3
	8.1 Email Background	
	8.2 Internet Mail Protocols	
	8.3 Structure of an Email message	
	8.4 Sending Email with PHP	
	8.5 Email-Id Validation and Email-Id Verification	

References:
1. Rasmus Lerdorf and Kevin Tatroe, Programming PHP, O'Reilly Publication
2. Beginning PHP 5, Wrox Publication
3. Mastering PHP, BPB Publication
4. PHP cookbook, O'Reilly Publication
5. Learning PHP and MYSQL, O'Reilly Publication
6. PHP and MYSQL, O'Reilly Publication
7. PHP for Beginners, SPD Publication
8. Robert W. Sebesta (3rd Edition), Programming the World Wide Web
9. www.php.net.in
10. www.w3schools.com
11. www.wrox.com

M.Sc. (CA) SEMESTER - II
M.Sc. (CA) PAPER - II
TITLE: OBJECT ORIENTED ANALYSIS AND DESIGN
PAPER CODE: CSA4202

[CREDITS - 4]

Learning Objectives:
1. Give an overview of object-oriented methodologies.
2. Learn about the concept of UML and UML diagrams
3. Know about the support for Modelling architecture in UML

	Title and Contents	No. of Lectures
Unit - I	**Introduction to UML** 1.1 Introduction to UML 1.2 Importance of modelling 1.3 Principles of modelling 1.4 Object oriented modelling 1.5 Conceptual model of the UML 1.6 Architecture 1.7 Software Development Life Cycle	**6**
Unit - II	**Basic and Advanced Structural Modeling** 2.1 Basic Structural Modeling: Classes, Relationships, Common Mechanisms and diagrams 2.2 Advanced Structural Modeling: Advanced Classes, Advanced relationships, Interfaces, Types and Roles, Packages	**8**
Unit - III	**Class & Object Diagrams** 3.1 Terms 3.2 Concepts 3.3 Modeling techniques for Class & Object Diagrams 3.4 Examples	**6**
Unit - IV	**Basic Behavioral Modeling - I** 4.1 Introduction 4.2 Interactions 4.3 Interaction diagrams 4.4 Examples	**5**
Unit - V	**Basic Behavioral Modeling - II** 5.1 Use cases 5.2 Use case Diagrams 5.3 Activity Diagrams 5.4 Examples	**8**
Unit - VI	**Advanced Behavioral Modeling** 6.1 Events and signals 6.2 State machines 6.3 Processes and Threads 6.4 Time and space 6.5 State chart diagrams 6.6 Examples	**5**
Unit - VII	**Support for modeling Architecture in UML** 7.1 Package diagrams	**6**

	7.2 Component diagrams	
	7.3 Deployment diagrams	
	7.4 Applications of UML in embedded systems, Web applications	
	7.5 Commercial applications	
Unit - VIII	**Case Study**	**4**

References:
1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.
3. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
4. Pascal Roques: Modeling Software Systems Using UML2, WILEY- Dreamtech India Pvt. Ltd.
5. Atul Kahate: Object Oriented Analysis & Design, The McGraw Hill Companies.
6. John W. Satzinger, Robert B Jackson and Stephen D. Burd, Object-Oriented Analysis and Design with the Unified Process Cengage Learning.

Learning Objectives:
1. To understand use of database connectivity, collections and networking in Java
2. To study web development using Servlets, JSP and JavaBeans

	Title and Contents	**No. of Lectures**
Unit - I	**Database Programming**	10
	1.1 The design of JDBC	
	1.2 Jdbc configuration	
	1.3 Types of drivers	
	1.4 Executing sql statements	
	1.5 query execution	
	1.6 Batch execution	
	1.7 Scrollable and updatable result sets	
	1.8 Rowset,Metadata, transactions.(Databases : Mysql/ SQL Server/ PostgreSQL/Oracle/MS-Access)	
Unit - II	**Collections**	**6**
	2.1 Collections	
	2.2 Introduction to the Collection framework (Interfaces, Implementation and algorithms)	
	2.3 Interfaces	
	2.4 Collection classes : Set, List, Queue and Map	
	2.5 Set : HashSet, TreeSet, and LinkedHashSet	
	2.6 Interfaces such as Lists, Set, Vectors, Stack, LinkedList, Comparator, Iterator, Enumerators, hash tables	
	2.7 Working with Maps: Map Interface and Map classes	
Unit - III	**Networking**	**7**
	3.1 The java.net package	
	3.2 Connection oriented transmission – Stream Socket Class	
	3.3 Internet Addressing	
	3.4 Inet Address	
	3.5 Factory methods	
	3.6 Instance methods	
	3.7 TCP/IP client socket	
	3.8 TCP/IP Server sockets	
	3.9 Creating a Socket to a remote host on a port(creating TCP client and server)	
	3.10 URL	
	3.11 URL Connection	
	3.12 Datagrams	
	3.13 Developing small application with sockets	
Unit - IV	**Servlet**	**10**
	4.1 Introduction to Servlet (HTTP Servlet)	

	4.2	Life Cycle of servlet	
	4.3	GenericServlet Class	
	4.4	Handing get and post request(HTTP)	
	4.5	Data handling using Servlet	
	4.6	Creating cookies	
	4.7	Session tracking using HTTP servlet	
	4.8	Servlet - JDBC	
	4.9	Security Issues	
Unit - V	**Web development using JSP**		**8**
	5.1	Introduction to JSP	
	5.2	JSP Architecture	
	5.3	JSP Directives	
	5.4	JSP scripting elements	
	5.5	Default objects in JSP	
	5.6	JSP Actions	
	5.7	JSP with Database	
	5.8	Error handling in JSP	
	5.9	Session tracking techniques in JSP	
	5.10	Introduction to custom tags	
Unit - VI	**JavaBeans Components**		**7**
	6.1	What is Bean?	
	6.2	Advantages	
	6.3	Using the Bean Development Kit (BDK)	
	6.4	The Bean Writing process	
	6.5	The Java Beans API	
	6.6	Enterprise Java Beans: Introduction to Enterprise java beans	
	6.7	Types of EJB, (session bean ,entity bean and message driven bean)	
	6.8	Sample program on EJB	

References:
1. Herbert Schildt (5th edition), Complete reference Java
2. Steven Horlzner, Java 2 programming black books
3. Jason Hunter,O'Reilly, Java Servlet Programming
4. Cay S. Horstmann, Gary Cornell, Core Java Volume-II - Advanced Features, Eighth Edition, Prentice Hall, Sun Microsystems Press
5. Ivan Bayross, Commercial web development using java 2.0, BPB
6. Richard Monson - Haefel, O'Reilly, Enterprise JavaBeans (3rd Edition)
7. Jim Keogh, Book Complete Reference J2EE

M.Sc. (CA) SEMESTER - II
M.Sc. (CA) PAPER - IV
TITLE: DATA MINING AND DATA WAREHOUSING
PAPER CODE: CSA4204

[CREDITS - 4]

Learning Objectives:
1. To study the structure of Data Warehouse and the ETL process
2. To study different data pre processing techniques
3. To study basic descriptive and predictive data mining techniques
4. To study some advanced data mining techniques and their applications
5. To use data mining tool on different data sets

	Title and Contents	**No. of Lectures**
Unit - I	**Introduction to Data Mining** 1.1 Definition of Data Mining and Data Warehousing 1.2 DM versus Knowledge 1.3 Discovery in Databases 1.4 Data to be mined 1.5 Basic mining techniques 1.6 Data Mining Issues 1.7 Data Mining Metrics 1.8 Social Implications of Data Mining 1.9 Overview of Applications of Data Mining	**8**
Unit - II	**Data Preprocessing** 2.1 Data Processing prerequisites 2.2 Attributes and Data types 2.3 Statistical descriptions of data 2.4 Distance and similarity measures 2.5 Need for Preprocessing 2.6 Handling Missing data 2.7 Data Cleaning 2.8 Data Integration 2.9 Data Reduction 2.10 Data Transformation and Data Discretization	**9**
Unit - III	**Introduction to Data Warehousing** 3.1 Architecture of DW 3.2 OLAP and Data Cubes 3.3 Dimensional Data Modeling-star, snowflake schemas 3.4 DMQL	**4**
Unit - IV	**Association Rule Mining** 4.1 Market Basket analysis 4.2 Frequent item-sets 4.3 Association rule mining: Apriori algorithm, FP growth algorithm, Sampling Algorithms	**6**
Unit - V	**Classification & Prediction** 5.1 Definition of classification 5.2 Model construction 5.3 Model Usage 5.4 Choosing algorithm 5.5 Decision tree Induction	**12**

	5.6 Information gain	
	5.7 gain ratio	
	5.8 gini index	
	5.9 Bayesian Classification	
	5.10 Bayes Theorem	
	5.11 Naïve Bayes classifier	
	5.12 Measuring performance of classifiers	
	5.13 Precision	
	5.14 Recall	
	5.15 F-measure	
	5.16 confusion matrix	
	5.17 cross-validation	
	5.18 Bootstrap	
	5.19 Linear Regression	
	5.20 Non-linear Regression	
	5.21 Logistic Regression	
Unit - VI	**Clustering** 6.1 Definitions 6.2 Partitioning methods 6.3 Hierarchical clustering 6.4 Density Based methods	**5**
Unit - VII	**Data Mining Tool** 7.1 Weka 7.2 Performance measures TP, FP, ROC 7.3 Baseline algorithms zeroR, oneR	**4**

References:

1. Tom Mitchell, Machine Learning, McGraw Hill, 1997
2. R.O. Duda, P.E. Hart, D.G. Stork, Pattern Classification, Second edition
3. Jiawei Han, Micheline Kamber, Jian Pei, Data Mining: Concepts and Techniques, ISBN:9789380931913, Elsevier Morgan Kaumann Publishers
4. Margaret H. Dunham, S. Sridhar, Data Mining - Introductory and Advanced Topics, Pearson Education
5. George Marak, Modern Data warehousing and mining and visualization, Pearson Publication

M.Sc. (CA) SEMESTER - II
M.Sc. (CA) PAPER - V
TITLE: PRACTICAL-I (BASED ON WEB TECHNOLOGIES AND ADVANCED JAVA)
PAPER CODE: CSA4205

[CREDITS - 4]

Continuous Internal Assessment

1	Journal	10 Marks
2	Viva	
	Web Technologies	10 Marks
	Advance Java	10 Marks
3	Flexible-Internal test	10 Marks
4	Attendance + Active Participation	10 Marks
	TOTAL	**50 Marks**

End Semester Assessment

1	Web Technologies Programs	20 Marks
2	Advance Java Programs	20 Marks
3	Viva	10 Marks
	TOTAL	**50 Marks**

M.Sc. (CA) SEMESTER - II
M.Sc. (CA) PAPER - V
TITLE: PRACTICAL-I (BASED ON WEB TECHNOLOGIES AND ADVANCED JAVA)
PAPER CODE: CSA4205

[CREDITS - 4]

Web Technologies: Set of Assignments

Sr. No.	Title of Experiment / Practical
1	Write a PHP script for the following: Design a form to accept 3 strings from the user. Perform the following operations on strings and show the results. 1. Find the string2 in string1. 2. Replace the string2 by string3 in string1. 3. Compare string 2 with string3. 4. Convert all the strings to Upper case 5. Convert all the strings to Lowercase
2	Write PHP program to perform the following operations: 1. Union of two arrays 2. Traverse the array elements in random order 3. Calculate sum of array elements 4. Check the array element is negative or not using filter
3	Write a PHP script for the following: Design a form to accept the directory name/ file name from the user. Perform the file operations and show the results. 1. Display size of file 2. Display details about owner and user of File 3. Display type of file 4. Copy a file 5. Remove a directory
4	Write a PHP script for the following: Define an interface which has methods area(), volume(). Define constant PI. Create classes sphere, cylinder which implements this interface and calculate area and volume.
5	Write PHP script for the following: Design a form to accept student information (name, class, address). Once the student information is accepted, accept marks in next form (IP, DM, SPM, PPL, Project, Lab). Display the mark sheet for the student in the next form containing name, class, marks of the each subject, total and percentage.
6	Write PHP script for the following: Design a form to accept the username and password from the user. Once the user logs in, the second form should be displayed to accept the user details (Rollno, Name, Address). If the user does not enter the information within the specified time limit, expire the session and display a warning message.
7	Consider the following entities and their relationships: OrderMaster(Orderno, custname, Orderdate, Orderamt) OrderDetails(Productname, qty, rate) OrderMaster and OrderDetails are related with one-to-many relationship. Create a RDB in 3 NF for the above and solve following:

	Write PHP script to generate the bill in following format. Accept the Order number from the user.
	Order No: Order Date:
	S. No. Customer Product Quantity Rate Total
	Name Name
8	Write a PHP program to implement Create, Insert, Update and Delete, Display operations on Employee table with attributes (empno, empname, dateofjoin, address, salary).

9	Write a PHP script to accept an .XML file having following details:
	 <Geeta Productions>
	 <Movie>
	 <MovieName>……….</MovieName>
	 <Actor Name>…………</ActorName>
	 <ReleaseYear>…………</ReleaseYear>
	 </Movie>
	 </Geeta Productions>
	 for at least 5 movies.
	     1. Display the information of movies released in year 2000.
	     2. Display the information of movies acted by a specific actor.
	     3. Display the information of a specific movie.

10	Write a PHP script to recursively process XML document. Accept the name of the XML file from the user.

11	Write a script in PHP to divide the output screen into four quadrants and draw the following graphical shapes ,in each of them and save the file as ─shapes.php‖
	     1. Ist quadrant - Triangle
	     2. IInd quadrant - Rectangle
	     3. IIIrd quadrant - Pentagon
	     4. IVth quadrant - Ellipse
	 (All the above mentioned shapes should be filled with different colors.)

12	Write a program to add Watermark to the file and display it on the screen.

Advance Java: Set of Assignments

Sr. No.	Title of Experiment / Practical

1	Write a java JDBC program to create a Hospital (Hospno,Hospname,address) table. And insert the records in the table by accepting the details from user.
	     1. Create Hospital table in database
	     2. Accept n records details from user
	     3. Create JDBC database connection
	     4. Insert the details into the table using JDBC

2	Write a JDBC program to display the first record, last record, nth record of a student. (Student table should contain student id, name and class)
	     1. Establish database connection
	     2. Display first record
	     3. Display last record
	     4. Display nth record

3	Create a linked list containing the names of the days in a week. Display the following details:
	    1. Display the contents of the list using Iterator
	    2. Display the contents of the list in reverse order using ListIterator
	    3. Accept the day and display its index in a collection

4	Create a Hash table containing student name and percentage. Accept the details from user. Display the details of the hash table. Search for a specific student and display percentage of that student.
	
	    1. Accept the details of Student
	    2. Create Hash table and add details
	    3. Display Hash table contents
	    4. Search a specific student and display percentage

5	Write a server program which echoes messages sent by the client.
	The process continues till the client types "END".
	    1. Create server program
	    2. Create client program
	    3. Display messages received from client
	    4. Handle END message

6	Write a Java Socket program that runs on a server which accepts a message from client & sends this message to the server by changing the case.
	    1. Create server program
	    2. Create client program
	    3. Accept the messages from client
	    4. Send message to the server by changing the case

7	Design a servlet to display "Welcome IP address of client" to first time visitor. Display "Welcome-back IP address of client" to revisited visitor.
	    1. Create basic servlet
	    2. Display Welcome message
	    3. Display Welcome-back message
	    4. Display IP address of client & Use of proper session tracking technique

8	Write a Java program to display book details on browser from database using servlet. Book (bno,bname,price)
	    1. Create Book table in database
	    2. Create JDBC database connection
	    3. Fetch the book details from database
	    4. Display book details on browser using servlet

9	Create a servlet that will return Course details such as Course name and Course Fee in tabular format using servlet. Fetch the course details from database.
	    1. Create course table and insert data using database
	    2. Create basic servlet
	    3. Establish connection and fetch the details from database
	    4. Display the details in tabular format using servlet

10	Create a JSP page which accepts username and password. User can have 3 login chances only. If username and password is correct display Welcome message else display an error message.
	    1. Create user interface for accepting details
	    2. Accept details and check whether it is correct or not
	    3. Check for 3 login chances if it is not correct
	    4. Display appropriate message

11	Create a Html page which contains a list of colors & it should display the "Welcome" message with selected color on the next page using JSP.
	    1. Create HTML page
	    2. Get selected color
	    3. Display message in selected color

12	Write a JSP program to perform Arithmetic operations such as Addition, Subtraction, Multiplication and Division. Design HTML to accept two numbers in text box and radio buttons to display operations. On submit display result as per the selected operation on next page using JSP.
	    1. Create HTML page
	    2. Accept the details and perform the operation using JSP
	    3. Display the result using JSP

M.Sc. (CA) SEMESTER - II
M.Sc. (CA) PAPER - VI
TITLE: PROJECT USING PHP OR JAVA
PAPER CODE: CSA4206

[CREDITS - 4]

Evaluation for Internal (50 Marks)

Sr. No.	Description	Marks
1	Analysis and Design Document	10 Marks
2	First Demo	15 Marks
3	Second Demo	15 Marks
4	Presentation	10 Marks

End term Evaluation (50 Marks)

Sr. No.	Description	Marks
1	Demo	20 Marks
2	Report	10 Marks
3	Presentation	10 Marks
4	Viva	10 Marks

M.Sc. (CA) SEMESTER - II
M.Sc. (CA) PAPER - VII
TITLE: SELF LEARNING: BASICS OF LINUX
PAPER CODE: CSA4207

[CREDITS - 1]

Learning Objectives:
1. Understand the basic concepts of LINUX operating system

	Title and Contents	Learning Hours
Unit - I	**Introduction** 1.1　　LINUX operating system 1.2　　The kernel 1.3　　The shell 1.4　　The programs 1.5　　Files and Processes 1.6　　Directory Structure	**3**
Unit - II	**Directories and File System** 2.1　　Listing files and directories 2.2　　Making directories 2.3　　Changing directories 2.4　　Directories. 2.5　　Pathnames	**4**
Unit - III	**Basic File operations** 3.1　　Copying files and Moving files 3.2　　Removing files and directories 3.3　　Displaying the contents of the files on the screen 3.4　　Searching the contents of the file	**4**
Unit - IV	**Redirection** 4.1　　Introduction 4.2　　Redirecting the input 4.3　　Redirecting the output 4.4　　Wild card characters 4.5　　Pipes	**4**

Note: The evaluation is for 10 Marks based on above concepts.

References :
1. William E. Shotts, The Linux Command Line: A Complete Introduction
2. Ellen Siever, Stephen Figgins, Robert Love and Arnold Robbins, Linux in a Nutshell, O'Reilly