



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Department of Master of Computer Applications

2 Years MCA Structure

Pattern: 2022-23



Prof. Rinku Dulloo
Chairman BOS



Dr. Ram Joshi
Dean Academics



PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



INDEX

Sr.No	Contents	Page No
1	Vision & Mission	3
2	PO's	5
3	PSO's	6
4	Highlights of the syllabus	7-8
5	Syllabus Structure	9-12


Prof. Rinku Dulloo
Chairman BOS


Dr. Ram Joshi
Dean Academics


PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarsi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



Department of Master of Computer Applications

Vision

“To progress as a center of brilliance in computing education producing globally proficient professionals contributing to the betterment of the society.”

Mission

1. To educate students in the basic standards of Software Engineering
2. To educate students to become successful professionals
3. To propel students for research and entrepreneurship

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



R

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jayawant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033

Dr. Rakesh Jain
Director



Department of Master of Computer Applications

Program Outcomes (POs)

- PO1: Computational Knowledge: Apply knowledge of computing fundamentals and domain knowledge.
- PO2: Problem Analysis: Identify, formulate and solve complex computing problems reaching substantiated conclusions.
- PO3: Development of Solutions: Design and evaluate solutions for complex computing problems with appropriate consideration.
- PO4: Investigations of complex Computing problems: Use research-based knowledge and research methods for analysis and interpretation of data, and synthesis of the information to provide valid conclusions
- PO5: Modern Tool Usage: Create, identify and apply appropriate techniques, resources, and modern computing tools to complex computing activities.
- PO6: Professional Ethics: Understand and commit to professional ethics and cyber regulations for professional computing practices.
- PO7: Life-long Learning: Identify the need and have the ability, to engage in independent learning as a computing professional.
- PO8: Project management and finance: Understand and apply computing, management principles to manage multidisciplinary projects
- PO9: Communication Efficacy: Communicate effectively with the computing community, and with society.
- PO10: Societal and Environmental Concern: Understand and assess societal, environmental, health, safety, legal, and cultural issues
- PO11: Individual and Team Work: Function effectively in diverse teams and in multidisciplinary environments.
- PO12: Innovation and Entrepreneurship: Identify a timely opportunity and using innovation to pursue that opportunity.

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarsi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



Department of Master of Computer Applications

Program Specific Outcomes (PSOs):

Upon successful completion of PG MCA Program, the students will attain following

Program Specific Outcomes:

PSO1: Professional Skills-

To provide an opportunity to work effectively with teams and group with better communication skills in written and oral form. Also, to develop an appreciation of ethics and social awareness needed and with this to develop master for successful career and leadership position

PSO2: Problem-Solving Skills-

To prepare the students for technical and managerial skills necessary to design and implement computer applications to conduct open ended problem solving and applying critical thinking

PSO3: Professional Career and Entrepreneurship-

The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and zest for the higher studies and research and entrepreneurship

Prof. Rinku Dooloo
Chairman BOS

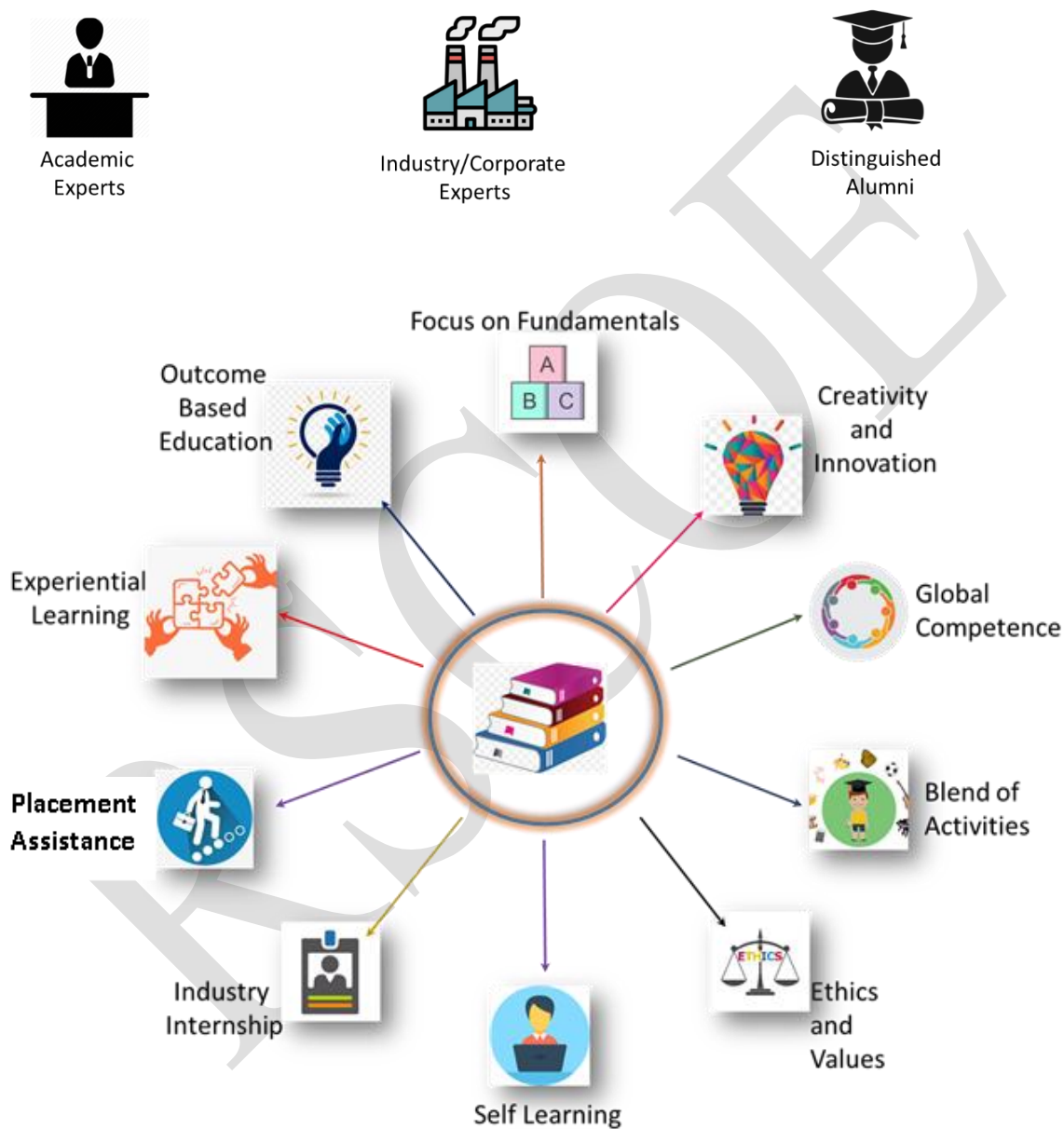
Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarsi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



Highlights of the Syllabus

Curriculum of MCA is designed in consultation with



Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



***Everybody knows Technology but
“Application makes a Difference”***

- The curriculum of MCA is designed in a way such that, students will get knowledge of most trending and “in use” industrial technologies and practices by the time they complete their post-graduation. Keeping this goal in mind updates the curriculum as and when required.
- MCA curriculum is designed to build a strong basic and clear all the fundamental concepts.
- Bridge course is introduced during the induction program for two weeks to learn basic concepts.
- Mini Projects- To understand the importance of working in teams and being part of collective success, we have incorporated Mini projects in each semester where student will work together and implement it.
- Human Values Course- RSCOE focus on the all-around development of our students. This includes refining their technical skills as well as their personal development. Human Values courses will teach them how to handle stressful situations, ethics of a professional and how to give back to the society. This will also motivate them to join the various CSR activities conducted by the company they join and help in achieving the different organizational goals of the company they join.
- Electives offered on emerging technologies. Students can opt any one as per his/her choice.
- Online Professional certification courses are enabled curriculum for all students.
- Language Proficiency courses - English, German and Japanese are introduced in curriculum. Student can opt any one of them.
- In order to make students ready for placement, gateway to industry course is given where basic aptitude and technical concepts are introduced.
- Professional communication skills course help students to develop over all personality and groom them.

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Master of Computer Applications (MCA)

Semester-I

Course Code	Course	Teaching Scheme		Semester Examination Scheme of Marks						Credits		
		TH	PR	ISE (20)	MSE (30)	ESE (50)	TW	PR	TOTAL	TH	PR	TOTAL
MCA221101	Data Structure with C++	4	4	20	30	50	25	50	175	4	2	6
MCA221102	Modelling and Design the Data	4	4	20	30	50	25	50	175	4	2	6
MCA221103	Core JAVA	4	4	20	30	50	25	50	175	4	2	6
MCA221104	Computer Networks	3	-	15	20	40	-	-	75	3	-	3
MCA221105	Object Design & Agile Development	3	-	15	20	40	-	-	75	3	-	3
MCAHS221101	Language Proficiency-I (ENGLISH)	-	2	-	-	-	25	-	25	-	1	1
MCAHS221102	Language Proficiency-I (GERMAN)											
MCAHS221103	Language Proficiency-I (JAPANESE)											
MCAHS221104	Language Proficiency-I (FRENCH)											
MCA221106	Online Professional Training Courses MOOC/NPTEL/SWAY AM/ Coursera, Udemy, Spoken	-	2	-	-	-	25	25	50	-	1	1
Total		18	16	90	130	230	125	175	750	18	8	26

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



Master of Computer Applications (MCA)

Semester-II

Course Code	Course	Teaching Scheme		Semester Examination Scheme of Marks						Credits		
		TH	PR	ISE (20)	MSE (30)	ESE (50)	TW	PR	TOTAL	TH	PR	TOTAL
MCA221201	Advance JAVA Programming	4	4	20	30	50	25	50	175	4	2	6
MCA221202	Python Programming	4	4	20	30	50	25	50	175	4	2	6
MCA221203	Web Technology	4	4	20	30	50	25	50	175	4	2	6
MCA221204	Cloud Computing	3	-	15	20	40	-	-	75	3	-	3
MCA221205	Elective-I	3	-	15	20	40	-	-	75	3	-	3
MCA221206	Gateway to Industry	-	2	-	-	-	25	-	25	-	1	1
MCA221207	Professional Communication Skills	-	2	-	-	-	25	25	50	-	1	1
Total		18	16	90	130	230	125	175	750	18	8	26

Elective-I	
Course Code	Course
MCA221205A	Internet of Things
MCA221205B	Design and Analysis of Algorithm
MCA221205C	Cyber Security and Cyber Law

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



MCA221205D	Dev Ops
MCA221205E	Block Chain Technology
MCA221205F	Big Data Analytics
MCA221205G	Research Methodology
MCA221205H	Entrepreneurship Development
MCA221205I	Management Information System

Master of Computer Applications (MCA)

Semester-III

Course Code	Course	Teaching Scheme		Semester Examination Scheme of Marks						Credits		
		TH	PR	ISE (20)	MSE (30)	ESE (50)	TW	PR	TOTAL	TH	PR	TOTAL
MCA222101	Advance Database & Knowledge Mining	4	4	20	30	50	25	50	175	4	2	6
MCA222102	Elective-II	4	4	20	30	50	25	50	175	4	2	6
MCA222103	Emerging Software Testing and Tools	4	2	20	30	50	25	25	150	4	1	5
MCA222104	Data Science	3	-	20	30	50			75	3	-	3
MCA222105	Software Project Management	3	-	20	30	50	-	-	75	3	-	3
MCA222106	Technical Seminar	-	2	-			25	25	50	-	1	1
MCAHS222101	Human Values and Ethics	-	2	-	-	-	25	25	50	-	1	1
Total		18	14	100	150	250	125	175	750	18	7	25

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Elective-II	
Course Code	Course
MCA222102A	Advance Development Technology
MCA222102B	Mobile Application Development
MCA222102C	Artificial Intelligence and Machine Learning
MCA222102D	Framework – Springboot
MCA222102E	Framework – React JS
MCA222102F	Framework – Jango

Master of Computer Applications (MCA)

Semester-IV

Course Code	Course	Teaching Scheme		Semester Examination Scheme of Marks						Credits		
		TH	PR	ISE	MSE	ESE	TW	PR	TOTAL	TH	PR	TOTAL
MCA222201	Self-Learning Course	-	-	-	-	-	50	-	50	-	02	02
MCA222202	Industrial Internship	-	-	-	-	-	200	250	450	-	18	18
Total		-	-	-	-	-	250	250	500	-	20	20

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics


PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
Director




Bridge-course for MCA
Academic Year – 2022-2023

Teaching Scheme: TH : 03 Hours/Day PR : 01 Hr./Day	Duration 2 Weeks	Examination Scheme: Lab Evaluation : 25 Marks Theory Exam : 100 Marks Total :125 Marks
Course Objective:		
Course Outcome: After successful completion of the course, students will able to: CO1 : They will know the concepts of mathematics and application areas CO2 : Read, understand and implement the real world problem in C++ language. CO3: Will have an exposure of fundamentals of Operating System. CO4: Develop the skills required for Web development process.		
Course Contents		
Course Contents		
UNIT-I	Mathematical Foundations	05 Hours
Set theory, relations and functions, binomial coefficients and its applications, recurrence relation and its solutions, principle of inclusion and exclusion, mathematical logic.Graph Theory.		
UNIT-II	Fundamentals of C++ programming	12 Hours
OOP's paradigm, evolution of programming language Introduction to Object Oriented Programming: Object and Classes, Features of Object Oriented Programming, Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic Binding, Resilience to change, Reusability of Code, Modularity of Code, Data Types in C++, Operator and Expression Decision making and Branching Statement. Introduction to arrays, Operation on arrays, Array initialization, Multidimensional Array, Structures, declaration definition accessing members, nested structures, array of structures. Unions, strings representation, string manipulation. Modular programming: Function components, passing data to the function, function return data type, passing by reference, macros, and inline function passing arrays to the function passing structure to the functions. Storage classes, recursion. Classes, Object and Methods: Class Fundamentals, Declaring and Creating object, Accessing class, members and methods. Subclasses, scope of the function.		


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director




JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



UNIT-III	Fundamentals of Web Development	12 Hours
<p>Introduction: WWW, W3C, Common HTML Tags and attributes, Ordered & Unordered Lists, Inserting image, image mapping, Text and image links, Tables, Frames, Forms, Introduction with text box, text area, List box, radio, checkbox etc. buttons. Introduction to CSS : Style Sheet, Types of style Sheets-Inline, External, Embedded CSS, CSS Border, margin, Positioning properties, color, text, link, background, list, table, padding, image, display properties, Use of Id & classes in CSS, use of <div> & , Introduction of CSS3 : Gradients, Transitions, Animations, multiple columns. Introduction to javascript : Concept of script, Types of Scripts, Introduction to javascript, Variables, identifiers constants in javascript and examples of each, Operators in javascripts, various types of javascript operators, Concept of array, how to use it in javascript, types of an array, examples, Methods of an array & examples, Event handling in javascript with examples, Math and date object, String object, DOM concept in javascript, DOM objects, Window navigator, History object and its methods, Location object with methods and examples, Validations in javascript.</p>		
UNIT-IV	Fundamentals of Operating System	05 Hours
<p>CPU scheduling, Synchronization: Critical section problem, Deadlock. Memory Management, Disk Management, OPEN source OS.</p>		
<p>Reference Books:</p> <p>R1. Mastering, C++ , T. Rajkumar, K.R Venugopal, T Ravikumar Tata McGraw Hill 1st Edition 2012 R2. Object-Oriented Programming with C++, E. Balaguruswamy Tata McGraw Hill 4th Edition 2002. R3. Complete reference HTML, TMH, 4th Ed. R4. HTML, DHTML, JavaScript, Perl & CGI Ivan Bayross, BPB Pub, 3rd Ed R5. JavaScript, PERL-CGI, BPB Pub, 3rd Ed. R6. Operating System : Achyut Godbole, TMH, 2nd Ed R7. System Programming & OS : D.M. Dhamdhere, TMH, 2nd Ed</p>		


Prof. Rinku Dulloo
Chairman BOS


Dr. Ram Joshi
Dean Academics


PRINCIPAL
Jayawant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F. Y. MCA
Academic Year – 2022-2023 Semester -I
[MCA221101]: Data Structure with C++

Teaching Scheme: TH: - 04 Hours/Week PR: - 04 Hours/Week	Credit TH: 04 PR: 02	Examination Scheme: In Sem. Evaluation : 20 Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW Evaluation : 25 Marks PR Evaluation : 50 Marks Total : 175 Marks
---	---	--

Course Prerequisites: C programming and Fundamental Data Structure

Course Objective:

1. To develop programming skill and to solve engineering related problems using Object Oriented Programming Concepts.
2. Learning program independent view of data structures, including its representation and operations performed on them.

Course Outcome:

After successful completion of the course, students will able to:

- CO1: Implementing the concept of classes and object to various real-world scenario
 CO2: Apply of the object-oriented concepts of C++ to solve real world problems
 CO3: Implementation, use of file streams and exception handling.
 CO4: C++ Programming with Linear and Non-linear data structure is intended for software engineers, systems analysts, program developers
 CO5: Implantation of various sorting and searching algorithms using C++

Course Contents

UNIT-I	Introduction to OOPs concept and programming in C++	08 Hours
OOP's paradigm, evolution of programming language, Introduction to Object Oriented Programming: Object and Classes, Features of Object Oriented Programming, Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic Binding, Resilience to change, Reusability of Code, Modularity of Code, Data Types in C++, Operator and Expression Decision making and Branching Statement strings representation, string manipulation Modular programming: Classes, Object and Methods: Class Fundamentals, Declaring and Creating object, Accessing class, members and methods. Subclasses, scope of the function. Object initialization and Clean up: Constructor, parameterized Constructor, Constructor Overloading, Destructors order of construction and destruction, Static Member with constructors and destructors.		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director




JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



UNIT-II	Polymorphism & Inheritance	09 Hours
Introduction, overloadable operators, unary operator overloading, operator keyword, binary operator overloading, concatenation of strings, comparison operator, assignment operator overloading, overloading of new and delete data conversion. Virtual Functions: Need for virtual functions, pointer to derived class objects, abstract classes, dynamic binding, virtual destructor, friend function Inheritance: Defining a subclass, forms of inheritance, inheritance and member accessibility, constructor and destructor in derived class, overloaded member functions, Multilevel inheritance, Multiple Inheritance, Hybrid Inheritance, Hierarchical inheritance.		
UNIT-III	File I/O Streams and Exception handling	08 Hours
Files: Stream Classes, Character Stream, Byte Stream, Using Stream I/O, Serialization Exception handling: Exception Handling Fundamentals, The try Block, the catch Exception Handler The try/throw/catch sequence, Uncaught Exception		
UNIT-IV	Linear Data Structure	07 Hours
Data Structure, Implementation of Data Structure, Fundamentals of Arrays and linked lists, Basics and implementation of Stacks, Queues,		
UNIT-V	Non-Linear Data Structure	09 Hours
Binary Tree, Binary Tree Representation, Binary Search Tree (BST), Creating a BST, Binary Search Tree Traversal, Preorder, post order, In-order Traversal, AVL tree, introduction to B+, B* tree, Threaded Binary Tree, Expression Tree. Introduction, Graph Representation, Adjacency Matrix Adjacency List, Graph Traversals, Depth First Search, Breadth First Search.		
UNIT-VI	Searching and Sorting	04 Hours
Searching: Linear search and Binary search Sorting: Selection sort, Insertion sort, Bubble sort		
Lab Contents		
Guidelines for Assessment		
Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.		
List of Laboratory Assignments/Experiments (to be covered)		
1	Fundamental Programming with Classes, Object and Methods using C++	
2	Programming with Object initialization and Clean up	


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



3	Implementation of virtual function, friend function
4	Demonstration of Inheritance concepts.
5	Use of input output streams using file handling.
6	Implementation of Data Structure using Arrays
7	Data Structure Implementation by linked lists
8	Basics and implementation of Stacks and Queues,
9	Implementation of advance data structure concept trees and graphs
10	Programming with Sorting techniques
11	Programming with Searching techniques

Text Books:

T1: Object-Oriented Programming with C++, E. Balaguruswamy Tata McGraw Hill 4th Edition 2002

T2: Data Structures Using C ++ by Malik D S

Reference Books:

R1. Mastering, C++, T. Rajkumar, K.R Venugopal, T Ravikumar Tata McGraw Hill 1st Edition 2012.

R2. C++ Complete Reference, Herbert Schildt, Tata McGraw Hill, 4th Edition 2003.

R3. C++ and Object-Oriented Programming Paradigm, Debasish Jana, PHI, 3rd Edition, 2005

R4. Data Structures Using C ++ by Malik D S

R5. Practical Approach to Data Structures by Hanumanthappa

R6. Data Structure Using C++ by Kasiviswanath N.

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F. Y. MCA
Academic Year – 2022-2023 Semester-I
[MCA221102]: Modelling and Design the Data

Teaching Scheme: TH: - 04 Hours/Week PR: -04 Hours/Week	Credit TH: 04 PR: 02	Examination Scheme: In Sem. Evaluation : 20 Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW Evaluation : 25 Marks PR Evaluation : 50 Marks Total : 175 Marks
--	---	--

Course Objective:

1. Creation of Database and functions of Database Management System.
2. Database models, SQL and database operations, this creates a strong foundation for application database design.
3. Making aware of current databases used in industry.

Course Outcome:

After successful completion of the course, students will able to:

- CO1.** Develop conceptual schema of database using conceptual model. Implement logical scheme of database.
- CO2.** Create and manage database with all integrity constraints. Perform various DDL and DML operations. Refine the scheme of database by applying normal forms.
- CO3.** Implement the transaction management protocols and crash recovery algorithms. Create views, procedures, functions and triggers on databases.
- CO4.** Create and manage NoSQL database, perform basic operations.

Course Contents

UNIT-I	Introduction to Database Management System	7 Hours
Database system applications, Database system vs file system, data abstraction , Instances and schemas, database users, Database system structure , Database design and ER diagram, ER design – Entities, attributes, Entity sets, Relationship sets, additional features of ER model, Introduction to different databases.		
UNIT-II	Introduction to Relational model	8 Hours
Integrity constraints over the relations, Enforcing integrity constraints , Database languages, DDL,DML, Basic form of SQL query, Querying relational data , logical database design, views, Destroying and creating tables/views, queries, sub queries, nested queries, null values, relational algebra- selection, projection, renaming, join examples.		
UNIT-III	File Organization& Normalization	8 Hours

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Comparison of File Organizations, types with examples, Schema refinement, problems caused by redundancy, decomposition, problem related to decomposition, reasoning about FDS – FIRST, SECOND, THIRD Normal forms, BCNF Lossless decomposition, Dependency-preserving decomposition schema refinement in Database design multi valued dependencies Fourth Normal Form and Fifth Normal form.

UNIT-IV	Transaction Management & Concurrency Control	8 Hours
----------------	---	----------------

ACID properties, Transactions and schedules, concurrent execution of transactions, serializability and recoverability. Introduction to Lock management, Lock conversions, dealing with Deadlocks, concurrency without locking, performance locking, Transaction support in SQL.

UNIT-V	Crash Recovery and Backup	8 Hours
---------------	----------------------------------	----------------

Failure classifications, Log based recovery, recovery with concrete transactions, Database backup & recovery from catastrophic failure, Remote backup system, Crash recovery, Aries algorithm, Security and privacy: Database security issues, Discretionary access control based on grant & revoking privileges; Encryption & public key infrastructures.

UNIT-VI	NoSQL databases	5 Hours
----------------	------------------------	----------------

Evolution of NoSQL databases, Structure, Advantages & Disadvantages, Comparison with relational databases, types, Study based on any two types of NoSQL databases, Basics, syntax, operations (minimum 10)

Lab Contents


Guidelines for Assessment

Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

List of Laboratory Assignments/Experiments (minimum -- to be covered)

1	Introduction to SQL – DDL, DML, DTL basic data types.
2	Create Database, select database, Drop database
3	Create Table, Drop table, Insert Query, Select Query
4	Operators, Expressions, where clause, AND & OR clauses.
5	Update Query/Delete Query, Like clause, Limit Clause
6	Order By, Group By, With Clause, Having Clause, Distinct keyword
7	Constraints, Joins, Union Clause, NULL Clause, Alias Syntax


Prof. Rinku Dullo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Talhane, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



8	Alter Command, Truncate Table, Transactions Locks, Sub Queries, Auto increment, Privileges
9	Functions : Date & Time, String, Functions, Aggregate Functions.
10	Synonym: Introduction , Create, Synonym as alias for table & view, drop
11	Sequence: Introduction , alter sequence, drop
12	View: Introduction, types, alter, drop.
13	Index: Introduction, types, alter, drop.
14	Queries, Sub Queries and nested queries. Basic operations on open source NoSQL database
15	Primary introduction to DBA- User create, alter user, Grant, Revoke
16	Report writer using SQL, Title, Btitle, Skip, Pause, column, SQL, Break on, Computer sum.
17	PL/SQL Introduction of PL/SQL, Advantages of PL/SQL, Support of SQL, Executing PL/SQL
18	PL/SQL character set & Data Types
19	PL/SQL blocks, attributes % type, %row type, operators
20	Control structure condition – if interactive –loop, for, while sequential- goto
21	Procedures- Definition, creating, parameter
22	Function- Definition, creating, parameter
23	Cursor – types.
24	Database Triggers- Definition, syntax, parts of triggers, Types of triggers, enabling & disabling triggers.

Text Books:

- T1.** AviSilberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts, Sixth Edition
T2. Introduction to Database Systems, C, J Date, 8/e, Pearson, 2008.

Reference Books:

- R1.** Alexis Leon, Mathews Leon, (leon press), Database Management System.
R2. Database Management Systems, :Ragurama Krishnan and Johannes Geherke, TMH 3rd.
R3. Database System Concepts, Avi Silberschatz, Henry F. Korth, S. Sudarshan, 5/e.
R4. Database Management Systems, Elmsari Navathe, 5/e, Pearson, 2005
R5. Database Management Systems, Majumdar, Bhattacharyya, TMH, 96
R6. Data base System Concepts, Peter ROB, Coronel, Cengage.

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F. Y. MCA
Academic Year – 2022-2023 Semester -I
[MCA221103]: Core JAVA

Teaching Scheme: TH: -Hours / Week: 04 LAB: -Hours / Week: 04	Credit TH: 04 LAB: 02	Examination Scheme: In Sem. Evaluation: 20 Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW : 25 Marks PR : 50 Marks Total : 175 Marks
--	------------------------------------	---

Course Prerequisites: Object Oriented Programming

Course Objective:

1. Introduces Object-oriented programming concepts using the Java language.
2. Introduces the principles of inheritance and polymorphism; and demonstrates how they relate to the design of abstract classes
3. Introduces the implementation of packages and interfaces
4. Introduces exception handling, event handling and multithreading
5. Introduces the design of Graphical User Interface using applets and swings

Course Outcome:

After successful completion of the course, students will able to:

- CO1:** Develop applications for a range of problems using object-oriented programming techniques.
CO2: Application of inheritance and polymorphism and of packages and interfaces.
CO3: Can implement exception handling, event handling and multithreading.
CO4: Design simple Graphical User Interface applications using AWT and Swing.
CO5: Developing Applet Programming.
CO6: Will have hands on using framework classes

Course Contents

UNIT-I	Object oriented thinking and Java Basics	08 Hours
Need for oop paradigm, summary of oop concepts, History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, using final with variables, garbage collection, overloading methods and constructors, recursion, nested and inner classes, exploring string class.		
UNIT-II	Inheritance, Packages & Interfaces	08 Hours

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Inheritance: Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance and methods, polymorphism- method overriding, abstract classes, the Object class.

Packages: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages. Interfaces: differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT-III	Exception handling	05 Hours
-----------------	---------------------------	-----------------

Exception handling: Concepts of exception handling, benefits of exception handling, Termination or presumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. String handling, Exploring java.util

UNIT-IV	Event Handling & Swing	08 Hours
----------------	-----------------------------------	-----------------

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

Swing: Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables. Handling menus, graphics, layout manager – layout manager types – border, grid, flow, card and grid bag.

UNIT-V	Applets	05 Hours
---------------	----------------	-----------------

Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

Multithreading: Differences between multi-threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter-thread communication, thread groups.

UNIT-VI	Java Collection Framework	11 Hours
----------------	----------------------------------	-----------------

Collections Overview: The Collection Interfaces

- a. Collection Interface, List Interface, Set Interface,
- b. Sorted Set Interface
- c. The Collection Classes
- d. Array List Class, Linked List Class, Hash Set Class, Tree Set Class
- e. Accessing a Collection via an Iterator The Map Interfaces
- f. Map Interface, Sorted Map Interface
- g. The Map Classes
- h. Hash Map, Tree Map The Legacy Interfaces
- i. Enumeration Interface
- j. The Legacy Classes Vector, Stack Hash table

Lab Contents

Guidelines for Assessment

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Talhane, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

List of Laboratory Assignments/Experiments (minimum to be covered)

1	Fundamental JAVA Programming assignments based on class,
2	Implementation of various Inheritance types.
3	Abstraction feature demonstration,
4	Achieving the functionality of Encapsulation.
5	Demonstrate the feature of Dynamic binding,
6	Polymorphism feature implementation,
7	Handling the feature of streams related to I/O systems,

Text Books:

T1. Programming with Java, A Primer E. Balguruswami, McGraw-Hill, 4th Ed.

T2. Object oriented programming with java, Essentials and applications, McGraw Hill publications,

Reference Books:

R1. Just Java by Peter Van der Linden

R2. OOP with Java An ultimate Tutorial by Jaffry A Borror,

R3. Java 6 Programming Black Book By Kogent Solution Inc, dreamTech Pub

R4. Core Java 2 Volume - I Cay S Horstmann, Fary Cornell, Sun Microsystems Press

R5. Core Java 2 Volume - II Cay S Horstmann, Fary Cornell, Sun Microsystems Press

R6. Rajkumar Buyya, S Thamarai Selvi, Xingchen Chu

R7. A programmer's Guide to java SCJP certification, Pearson, Khalid A. Mughal, Rolf W. A Rasmussen

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



F. Y. MCA
Academic Year – 2022-2023 Semester-I
[MCA221104]: Computer Networks

Teaching Scheme: TH: -Hours/Week : 03	Credit TH: 03	Examination Scheme: In Sem. Evaluation: 15 Marks Mid Sem. Exam : 20 Marks End Sem. Exam : 40 Marks Total : 75 Marks
--	--------------------------------	--

Course Objective:

1. To get familiar with basics of networking concepts, functions of various layers in networking architecture.
2. To know the basics of transmission techniques and media used in networking environments
3. To Understand the components used in networking and different protocols
4. It explains about DNS and network management protocols
5. To acquire the knowledge about network security

Course Outcome:

After successful completion of the course, students will able to:

CO1: Gain the basic knowledge of transmission media, modes, network topologies and working of various layers in ISO/OSI, TCP/IP reference model

CO2: Describes/summarizes different network architectures

CO3: Obtain the skills of sub-netting and routing mechanism

CO4: Formulate Transport layer protocols

CO5: Having knowledge of application protocol standards

CO6: Describes various network security mechanism

Course Contents

UNIT-I	Introduction	10 Hours
Need of computer communication, Goals of communication system/Networking, Transmission Modes, Transmission Media: Guided: Twisted Pair, Coaxial and Fiber-Optic Cables, Unguided Media: Radio, VHF, Micro Waves and Satellite, Topologies: Star, Mesh, Bus etc., Multichannel Data Communication: Message, Circuits, Packets (Connection Oriented vs Connectionless Services) Components of LAN, WAN, MAN, Multiplexing: FDM, TDM, CDM and WDM, Protocol Layering: ISO/OSI Reference Model, TCP/IP Reference Model, OSI vs TCP/IP.		
UNIT-II	Common Network Architecture	6 Hours
X.25 Networks, Ethernet (Standard and Fast): frame format and specifications, Wireless LAN's – 802.11x, 802.3 Bluetooth etc.		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



UNIT-III	IP Addressing and Routing	8 Hours
IPv4 addresses – Network and Host part, Network Masks, Network addresses and Broadcast addresses, Sub-net Masking, Super Net Masking, Address Classes, Loop Back Address, IPv4 Structure, IP routing concept, Routing Table, IPv6 Structure, Addresses		
UNIT-IV	Transport Layer Services	8 Hours
Transport Services, Elements of Transport Protocols, Connection Management, TCP and UDP Protocols		
UNIT-V	Application Layer	6 Hours
DNS and DNS Servers (Installation and configuration), Electronic Mail: Architecture and Services, Message Format, MIME, Message transfer, SMTP, Mail Gateways, FTP, WWW: Introduction, Static and Dynamic web pages, www pages and browsing, HTTP request and response, Basics of DHCP.		
UNIT-VI	Network Security	7 Hours
Threat: Active and Passive Attacks, Cryptography: Symmetric and Asymmetric Key Cryptography, Digital Signature, Firewall		
Note : Demo of Microsoft windows, Linux OS' installation, configuration, Network Configuration, Install and configure network cabling and appliances Manage, monitor, and troubleshoot networks, cloud concepts: various services of cloud		
Reference Books: R1. Computer Networks by Andrew S. Tanenbaum 4ed R2. Data Communication and Networking by Behroz A. Forouzan, TMH, 4 ed. R3. Cryptography and Network Security by Atul Kahate, TMH 2 ed. R4. Cryptography and Network Security by William Stalling R5. Computer Networks and Internets with Internet Applications by Douglas E. Comer R6. Data and Computer Communication by William Stallings 9 ed., Pearson Education, 2007 R7. Network Security by Ankit Fadia		
Weblink: 1. Computer Storage Fundamentals: https://www.amazon.in/dp/9388176553/ref=cm_sw_em_r_mt_dp_MKCCJ90XA8MH90W5STQA 2. Windows Server: itfreetraining – YouTube 3. Cloud (MS Azure): https://docs.microsoft.com/en-us/learn/certifications/exams/az-900 4. Linux: The Complete Reference, Sixth Edition: http://dl.flipkart.com/dl/linux-complete-reference-sixth/p/itmfbh4hqyab7xqf?pid=9780070222946&cmpid=product.share.pp		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



5. Hardware Fundamentals (CompTIA A+): <https://www.comptia.org/training/books/a-core-1-220-1001-study-guide>, <https://www.comptia.org/training/books/a-core-2-220-1002-study-guide>
6. Networking Fundamentals (CompTIA N+): <https://www.comptia.org/training/books/network-n10-007-study-guide>

RSCOE

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarsi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F. Y. MCA
Academic Year – 2022-2023 Semester-I
[MCA221105]: Object Design & Agile Development

Teaching Scheme: TH: -Hours/Week : 03	Credit TH: 03	Examination Scheme: In Sem. Evaluation : 15 Marks Mid Sem. Exam : 20 Marks End Sem. Exam : 40 Marks Total : 75 Marks
--	--------------------------------	---

Course Prerequisites: Software Engineering Fundamentals

Course Objective:

1. To learn and understand the principles & concept of OOAD and Agile software development process.
2. To be acquainted with methods of capturing, specifying, visualizing and analyzing OOAD and Agile Methodology

Course Outcome:

After successful completion of the course, students will able to:

- CO1: Decide S/w models for developing a software
 CO2: Apply structural modeling on various domains
 CO3: Apply Behavioral modeling on various domains
 CO4: Develop the design to the point where it is ready for implementation
 CO5: Understand Agile Values and Principles in Software
 CO6: Decide on Agile Methodology for a developing a software

Course Contents

UNIT-I	System Development Life Cycle and Models	8 Hours
System Development Life Cycle, Different approaches and models for System Development: Prototyping, Spiral (including WIN-WIN Spiral), RAD, Software requirement Specification (SRS), IEEE Format - Case study: SRS, Reverse Engineering, Maintenance.		
UNIT-II	Object Oriented UML	7 Hours
Two views of software Developments: SSAD and OOAD, Rational Unified Process, Four Major phases:- Inception , Elaboration, Construction, Transition, Structural Modeling- Class Diagram, Object Diagram Case Study : Class Diagram and Object Diagram.		
UNIT-III	Object Oriented Behavioral Modeling I	8 Hours
Behavioral Modeling- Use Cases and Use Case Diagrams, Interaction Diagrams: Sequence Diagrams Case Study: Use Case diagram, Sequence diagram		
UNIT-IV	Object-Oriented Behavioral Modeling II & Architectural Modeling	8 Hours

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Behavioral Modeling- Interaction Diagrams cont: Collaboration Diagrams, Activity Diagrams, State chart Diagram. Architectural Modeling- Components & Component Diagrams, Deployment & Deployment Diagrams. Case Study: State chart diagram, Activity Diagram

UNIT-V

Agile Principles and Mindset

7 Hours

Why use agile, Knowledge work projects are different, Defined versus Empirical Processes, The Agile Mindset, Personal, Team and Organizational Agility, The Agile Triangle, The Agile Manifesto, The Four Value, The Twelve Principles

UNIT-VI

Agile Methodologies

7 Hours

Scrum, Extreme Programming (XP), Lean Product Development, Kanban, Crystal

Text Books:

T1: Software Engineering by Pressman

T2: Applying UML And Pattern Craig Larman Pearson Education INC UML in Nutshell

Reference Books:

R1. Software Engineering by Pressman

R2. Applying UML And Pattern Craig Larman Pearson Education INC UML in Nutshell

R3. Principles of Object- Oriented Software Development - Anton Eliens , Addison Wesley

R4. Scrum Mastery: From Good to Great Servant-Leadership by Geoff Watts

R5. Agile Project Management for Dummies by Mark C. Layton

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F. Y. MCA
Academic Year – 2022-2023 Semester-I
[MCAHS221101]: Language Proficiency-I (ENGLISH)

Teaching Scheme: PR: -Hours/Week : 02	Credit PR: 01	Examination Scheme: TW Evaluation : 25 Marks Total : 25 Marks
--	--------------------------------	--

Course Objective:

1. To enhance the systemic and specific knowledge and skills of the learners in the use of English language by improving their ability to listen, speak, read and write

Course Outcome:


After successful completion of the course, students will able to:

- CO1: Students will be able to Acquire knowledge of basic and fundamental grammar in English including reading and listening comprehension, writing and speaking skills.
- CO2: Construct different types of sentences using effective and new vocabulary to create good impression.
- CO3: Students will be able to write clearly, precisely and competently in different scenarios.
- CO4: Prepare the students to acquire structure and written expression required for their profession and enable them to acquire proper behavioral skills
- CO5: Students will be able to present themselves well in front of large audience on a variety of situations related to group communication and presentation in a relevant scenario. Moreover, they will get the knack for structured conversation to make their point of views clear to the listeners.

Course Contents

UNIT-I	Sentence Structure	05 Hours
Orientation, Parts of speech- Introduction to Noun, Pronoun, Verbs, Adverbs, Adjectives, Prepositions, Conjunctions, Interjections, Use present, past, and future tenses (2-3) with appropriate time markers Recognize present perfect, past perfect and future perfect tenses and their progressive forms Use perfect tenses with increasing accuracy.		
UNIT-II	Fundamentals of Communication (Vocabulary Building)	05 Hours
Vocabulary-Synonyms, Antonyms, Root words, Origin Prepositions- A preposition shows where, when or how the action took place in a sentence. Importance of proper punctuations, Idioms and Phrasal Verbs.		
UNIT-III	Nature and Style of Writing	02 Hours
E-mail Writing and etiquettes, Reading Comprehension-Reading and comprehending passages and figuring out the answers of given questions.		
UNIT-IV	Oral Communication	05 Hours


Prof. Rinku Dullo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director




JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Orientation about grooming, Fluency, body language, Non-verbal communication, Expressions, Group Discussion, Debate, Extempore- Orientation and Mock GD, Debate, Extempore rounds.		
UNIT-V	Presentation	03 Hours
PPT presentation/ Poster making, group presentations to boost stage confidence and to inculcate team building skills, practice and implement communication skills practices to gain fluency while communicating.		
List of Laboratory Assignments/Experiments (to be covered)		
1	Implementation of English including reading and listening comprehension, writing and speaking skills.	
2	Defining different types of sentences using effective and new vocabulary to create good impression	
3	Writing clearly, precisely and competently in different scenarios	
4	Implementation of written expression required for their profession and enable them to acquire proper behavioral skills	
5	Self-Introduction, Group Discussion	
Text Books:		
T1.	English for Engineers. Dr.K.Anbazhagan, Dr.B.Cauveri&Dr.M.P.Devika, Cengage Publications. 2016.	
T2.	Dhanavel, S.P. English and Communication Skills for Students of Science and Engineering. Units 1-5.Chennai: Orient, .Blackswan Ltd., 2009.	
T3.	Raman, Meenakshi and Sangeetha Sharama . Technical Communication-Principles and Practice. Oxford University Press. 2009.	
T4.	Day, R A. Scientific English: A Guide for Scientists and Other Professionals. 2nd ed. Hyderabad: Universities Press, 2000	
Reference Books:		
R1.	K.R.Laxminarayanan, English for Technical Communication, Scitech, Sixth Edition, 2008	
R2:	William Sanborn Pfeiffer ,T.V.S. Padmaja ,Technical Communication: A Practical Approach, Pearson, Sixth Edition 2012	
R3:	A.K.Jain, Praveen Bhatia, A.M.Shaikh, Professional Communication Skills, S. Chand and Co: Fifth edition ,2009	
R4:	Ashraf Rizvi ,Effective Technical Communication, Tata McGraw Hills publishing Company 2006	
R5:	F.T.Wood,Remedial English Grammar, Macmillan, 2007	
R6:	Andrea Rutherford, PhD. Basic Communication Skills for Technology, Pearson Education Asia,2001	
R7:	Exercises in Spoken English, Parts 1 and II CIEFL, Hyderabad , Oxford University Press	
R8:	Sanjay Kumar, Pushplata, Communication Skills, Oxford University Press, First edition, 2012	


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



F. Y. MCA
Academic Year – 2022-2023 Semester-I
[MCAHS221102]: Language Proficiency-I (German)

Teaching Scheme: PR: -Hours/Week : 02	Credit PR: 01	Examination Scheme: TW Evaluation : 25 Marks Total : 25 Marks
--	--------------------------------	--

Course Objective:

1. Introduction of Germany, Greetings, phrases, vocabulary,
2. Understanding of numbers till 100
3. Grammar- Introductory Sentence Formation, Articles, Pronouns, Tense, Prepositions, Question Formation

Course Outcome:

After successful completion of the course, students will able to:

- CO1: Students would know the basic information of Germany
 CO2: Students would be familiar with the pronunciation of German letters and greetings
 CO3: Students would be able to count till 100
 CO4: Students would be able to introduce themselves
 CO5: Students would be able to form basic questions

Course Contents

UNIT-I	Start auf Deutsch: (Begin in German)	04 Hours
Deutschland, Deutschsehen und hören, erste Kontakte, Texte: Lied, Postkarte, Wortfelder: internationale Wörter, deutsche Namen		
UNIT-II	Café	04 Hours
Gespräche im Café, Texte: Getränkekarte, Telefonbuch, Rechnungen, Wortfelder: Gespräche im Café, Zahlen bis 100, Strukturwörter		
UNIT-III	Städte, Länder, Sprachen: (Cities, Countries, Languages)	02 Hours
Sehenswürdigkeiten in Europa, Sprachen in Europa, Nachbarsprachen, Texte: Landkarten, ein Statistiker, Wortfelder: Himmelsrichtungen, Sprachen		
UNIT-IV	Menschen und Häuser: (People and Houses)	02 Hours

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Orientation about grooming, Fluency, body language, Non-verbal communication, Expressions, Group Discussion, Debate, Extempore- Orientation and Mock GD, Debate, Extempore rounds.


List of Laboratory Assignments/Experiments (to be covered)

1	Pronunciations of various words in German
2	Greetings in German
3	Counting up to 100 in German
4	Introducing himself/herself in German
5	Formation of question in German

Reference Books:

R1. Funk, Kuhn, & Demme. Studio d A1. Deutsch als Fremdsprache. 2011. Goyal Publishers & Distributors Pvt. Ltd. Delhi, India


Prof. Rinku Dulloo
Chairman BOS


Dr. Ram Joshi
Dean Academics


PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarsi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F. Y. MCA
Academic Year – 2022-2023 Semester-I
[MCAHS221103]: Language Proficiency-I (Japanese)

Teaching Scheme: PR: -Hours/Week : 02	Credit PR: 01	Examination Scheme: TW Evaluation : 25 Marks Total : 25 Marks
Course Objective: 1. To meet the needs of ever-growing industry with respect to language support, 2. To get introduced to Japanese society and culture through language		
Course Outcome: After successful completion of the course, students will able to: CO1: One will have ability of basic communication		
Course Contents		
UNIT-I	Introduction to Japanese Language	04 Hours
Hiragana basic Script, colors, Days of the week		
UNIT-II	Hiragana	04 Hours
Modified Kana, double consonant, Letters combined with ya, yu, yo Long vowels, Greetings and expression		
UNIT-III	Self-Introduction, Introducing other person	04 Hours
Numbers, Months, Dates, Telephone numbers, Stating one's age.		
List of Laboratory Assignments/Experiments (to be covered)		
1	Pronunciations of various words in Japanese	
2	Greetings in Japanese	
3	Counting up to 100 in Japanese	
4	Introducing himself/herself in Japanese	
5	Formation of question in Japanese	
Reference Books: R1. Basic Connections: Making Your Japanese Flow by Kakuko Shoji R2: Genki I: An Integrated Course in Elementary Japanese I - Workbook (English and Japanese Edition) Eri Banno		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



F. Y. MCA

Academic Year – 2022-2023 Semester-I
[MCAHS221104]: Language Proficiency-I (French)

Teaching Scheme: PR: -Hours/ Week : 02	Credit PRB: 01	Examination Scheme: TW Evaluation : 25 Marks Total : 25 Marks
---	---------------------------------	--

Course Objective:

1. To make the students understand the importance of learning a foreign language.
2. This module will help students learn the basics of French Language.
3. The learners would be able to greet people, talk about self, talk about where they live, about their family members and likes and dislikes
4. This A1.1 level will lay the foundation to the next A1.2 level learning of the language.

Course Outcome:

After successful completion of the course, students will able to:

CO1: Read/Write and understand French at an elementary level

CO 2: Listen to basic spoken French and demonstrate understanding by responding appropriately

Course Contents

UNIT-I	Vocabulary	06 Hours
Alphabet, Numbers, Family name & Given Name, Residence, Personal items, Classroom objects, Nationalities, Professions, Marital status (married / single), Countries & Cities, Hobbies		
UNIT-II	Grammar Topics	06 Hours
Personal subject pronouns, Tonic pronouns ,Present tense – State and Description, Common verbs: be, have, do, to be called ,ER Verbs: to live, to work, to talk, Verb: to understand (I and You forms), Condition for politeness (I would like to) ,Interrogation (the 3 forms) ,Interrogative words: Do you, what do you, Interrogative pronouns: Where, When, How much, Interrogative adjectives (what) , It is / This is / Here is, Use of definite and indefinite articles in the sentence, Zero article for professions, Cardinal numbers, Demonstrative adjectives Masculine/Feminine & Singular/Plural concept, Agreement of Adjectives (for nationalities), Some descriptive adjectives (big, small,), Position of adjectives		
UNIT-III	Speaking Topics	06 Hours
First encounters :Greet somebody, Take leave of somebody, Ask news or Give your news, Introduction Tell about yourself or somebody else, Give your name, Spell your name, Tell your age, Tell your , nationality, Tell your profession 3. Talk about your daily life Give your address/email, Give your phone number, Talk about your family, Talk about your hobbies, Describe an object / a person, Tell about something or someone , Say the price of an object, Talk about ownership, Talk about quantity, Describe the weather , Ask for an information, Ask for personal information ,Ask about the date Ask about		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



the time, Ask about a service

UNIT-IV

Sociocultural Knowledge

06 Hours

Greetings (when meeting people), Simple expressions to express politeness: excuse me, please, sorry, thank you, Informal you and Formal you.

Guidelines for Assessment

Assessment is a continuous assessment based on submission of the assignments, timely completion, attendance and understanding.

List of Laboratory Assignments/Experiments (to be covered)

1

Multiple choice questions online assessment after completion of every unit to evaluate the understanding of the grammar.

2

Spoken exercises to evaluate the learning in the conversational aspect of the language.

Text Books:

T1. Saison 1 (méthode de Français- Livre de l'élève)(textbook)

Reference Books:

R1. Saison 1 (cahier d'activités)(workbook)

R2. Collins dictionary (French-English) (French-French)

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F. Y. MCA
Academic Year – 2022-2023 Semester-I
[MCA221106]: Online Professional Training Courses

Teaching Scheme: PR: -Hours/Week : 02	Credit PR: 01	Examination Scheme: TW Evaluation : 25 Marks PR Evaluation : 25 Marks Total : 50 Marks
--	--------------------------------	---

Course Objective:

1. Certification of Students for knowledge and employability skills development.

Course Outcome:

After successful completion of the course, students will able to:

CO1: Have a knowledge of different certification platforms/resources

CO2: Getting the Certification from the professional organization such as MOOC/
NPTEL/SWAYAM/ Coursera, Udemy, Spoken Tutorials

CO3: Enhance the Employability.

Course Contents

MOOC:

A massive open online course (MOOC) is an online course aimed at unlimited participation and open access via the web. In addition to traditional course materials, such as filmed lectures, readings, and problem sets, many MOOCs provide interactive courses with user forums or social media discussions. The MOOC contains the organization like NPTEL/SWAYAM, Spoken Tutorials, Coursera, Udemy etc. These organizations contain many online courses.

NPTEL/SWAYAM:

It contains courses from different areas Such as Engineering, Management, Enterprenureship etc and soon. Under Computer engineering it contains courses like Scalable Data Science, Deep Learning, Cloud computing, Introduction to internet of things, Software Testing, Big Data Computing and So on,

Spoken Tutorials: It also contains the courses like courses from different areas Such as Engineering, Management etc. Under Computer engineering it contains courses like PHP, gateway, R, CAD etc and soon.

Coursera: It contains courses from different areas Such as Engineering, Management, Enterprenureship etc and soon. Under Computer engineering it contains courses like Java, C++, IOT,

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Linux, Block chain, Big Data etc.

Udemy: It contains courses from different areas Such as Engineering, Management, Enterprenureship etc and soon. Under Computer engineering it contains courses like Java, C++, IoT, Linux, Block chain, Big Data etc

Lab Contents


Guidelines for Assessment

Students are expected to choose one subject for certification. Self-learning Courses to be done as per the own choice from the different reputed organizations such as MOOC/ NPTEL/SWAYAM/Cousera/Udemy/Spoken Tutorials etc.

References:

- R1. <https://www.udemy.com>
- R2. <https://www.coursera.org>
- R3. <https://swayam.gov.in>
- R4. <https://spoken-tutorial.org/accounts/login/>


Prof. Rinku Dulloo
Chairman BOS


Dr. Ram Joshi
Dean Academics


PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



F.Y. MCA
Academic Year – 2022-2023 Semester -II
[MCA221201]: Advance JAVA

Teaching Scheme: TH: -Hours/Week : 04 LAB: -Hours/Week : 04	Credit TH: 04 LAB: 02	Examination Scheme: In Sem. Evaluation: 20 Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW : 25 Marks PR : 50 Marks Total : 175 Marks
--	--	---

Course Prerequisites: Core JAVA

Course Objective:

1. Students will be able to do socket programming, develop server-side applications with database
2. Students will be able to handling servlets, JSP, JDBC, EJB and JAVA Beans for server side applications in Java.

Course Outcome:

After successful completion of the course, students will able to:

- CO1:** Design simple client server programming
CO2: Can do servlet programming
CO3: Develop programming with JSP
CO4: Develop server-side applications with database
CO5: Implementation of beans will be known.
CO6: Acquainted with EJB architecture.

Course Contents

UNIT-I	Networking with Java	07 Hours
Networking basics - Sockets, port- Proxy servers, java.net – networking classes and interfaces Implementing TCP/IP based Server and Client Datagrams – Datagram packet, Datagram server and client URL connections Multithreaded Chat Server Multithreaded socket Programming.		
UNIT-II	Servlet	08 Hours
J2EE Platform: Enterprise Architecture Styles, Containers and Technologies. Servlet overview: The Java web server – your first servlet – servlet chaining – server side includes- Session management – security – HTML forms – using JDBC in servlets – applet to servlet communication		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director





JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



UNIT-III	JSP	08 Hours
JSP: Introduction JSP-Examining MVC and JSP -JSP scripting elements & directives-Working with variables scopes-Error Pages - using Java Beans in JSP Working with Java Mail-Understanding Protocols in Javamail-Components-Javamail API-Integrating into J2EE-Understanding Java Messaging Services-Transactions		
UNIT-IV	JDBC	08 Hours
JDBC : Introduction to JDBC, JDBC Drivers, Packages related to JDBC, JDBC Data Sources, Retrieving Meta Information from database and Result set, Distributed Transactions and Row Set objects, Accessing a Database through Servlets and JDBC.		
UNIT-V	JAVA Beans	07 Hours
Java Beans: The software component assembly model- The java beans development kit- developing beans – notable beans – using infobus - Glasgow developments - Application Builder tool- JAR files- Introspection-Bound Properties-Persistence-customizers - java beans API.		
UNIT-VI	EJB	07 Hours
EJB: EJB architecture- EJB requirements – design and implementation – EJB session beans- EJB entity beans-EJB Clients – deployment tips, tricks and traps for building distributed and other systems – implementation and future directions of EJB-Variable in perl- perl control structures and operators – functions and scope.		
Lab Contents		
Guidelines for Assessment		
Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.		
List of Laboratory Assignments/Experiments (minimum -- to be covered)		
1	Creation of servlet through the servlet programming concept	
2	Develop JSP pages with programming.	
3	Develop server side applications with database	
4	Implementation of beans will be known.	
5	Acquainted with EJB architecture.	
6	Application of Frameworks will be made easy in web application development.	
Text Books:		
T1. Java Complete Reference PatricNaughton, Herbert Schildt, TMH,7th Ed.		
T2. Java unleashed.; Micheal Morrison		


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



Reference Books:

- R1.** Beginning Java Networking Chad Darby, John Griffin & others
- R2.** Complete Reference- J2EE Jim Keogh, TMH.
- R3.** Inside Servlets Dustine R. Callway, Pearson pub.
- R4.** Developing Java Servlets James Goodwill, Techmedia Pub.
- R5.** Professional JSP Wrox press
- R6.** Complete reference JSP, TMH.
- R7.** Java Server Programming Vol-I Wrox press.
- R8.** JDBC, Servlet and JSP, Black Book, Santosh Kumar K. Dremtech publication
- R9.** Spring and Hibernate, Santosh Kumar K. Mc.Graw Hill Education
- R10.** Spring Persistence with Hibernate, Ahmad Seddighi

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F. Y. - MCA
Academic Year – 2022-2023 Semester - II
[MCA221202]: Python Programming

Teaching Scheme: TH: - Hours/Week : 04 PR: -Hours/Week : 04	Credit TH: 4 PR: 2	Examination Scheme: In Sem. Evaluation : 20 Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW : 25 Marks PR : 50 Marks Total : 175 Marks
--	---------------------------------	--

Course Prerequisites : Subject Name/Topic Name

Course Objective:

1. Describe the core syntax and semantics of Python programming language.
2. Describe the process of structuring the data using lists, dictionaries, tuples and sets.
3. Discover the need for working with the strings and functions and Infer the Object-oriented Programming concepts in Python.
4. Indicate the use of regular expressions and built-in functions to navigate the file system.
5. Hands on database operations and the use of python libraries used for data analysis.

Course Outcome:

After successful completion of the course, students will able to:

- CO1: Interpret the fundamental Python syntax and semantics and be fluent in the use of Python Conditional and looping constructs.
- CO2: Determine the methods to create and manipulate Python programs by utilizing the data Structures like List, Tuples, dictionaries, sets.
- CO3: Express proficiency in the handling of strings, functions and. Identify the commonly used operations Involving file Systems.
- CO4: Articulate the Object Oriented Programming concepts using python.
- CO5: Identify the commonly used operations involving regular expressions and exception Handling Concepts.
- CO6: Determine the methods to create and manipulate python database transactions, Express proficiency in Handling of python libraries used for data manipulation and Analysis.

Course Contents

UNIT-I	Introduction to Python	7 - Hours
What is Python and history of Python? Unique features of Python, Python-2 and Python-3 differences, Install Python and Environment Setup, First Python Program, Python Identifiers, Keywords and Indentation, Expressions and Statements, Operators and Operands in Python.(Arithmetic, relational and logical operators).		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Comments and document interlude in Python, Command line arguments, Getting User Input, Python Data Types, What are variables? Python Core objects and Functions, Number and Math's.

Conditional and Looping Construct-: if - else statement and nested if – else while, for, use of range function in for, Nested loops, break, continue, pass statement, Use of compound expression in conditional constructs

UNIT-II	List, Tuples, Dictionaries and Sets	8 Hours
----------------	--	----------------

List & Tuples in Python

Lists- Lists in Python, List functions and Methods, List Comprehensions and Lambda Expressions

Tuples- immutable concept, Ordered Sets with tuples, tuple functions.

Python Dictionaries and Sets

Python Dictionaries: Concept of key-value pair, creating, initializing and accessing the elements in a dictionary, Dictionary functions & Methods

Sets: Python Sets Examples, Sets operation (Membership, union, intersection, difference, and symmetric difference, set method)

UNIT-III	Input & Output in Python And Functions	8 Hours
-----------------	---	----------------

Input and Output in Python: Reading and writing text files, writing Text Files, Appending to Files and Challenge, Writing Binary Files Manually

Functions: Python user defined functions, Python packages functions, Defining and calling Function, The anonymous Functions, Python Modules & Packages, Packages Importing * From a Package, Intra-package References, Packages in Multiple Directories, random, time and time module, dir() function, Built-In Function, invoking built in functions, python string and string built in functions.

UNIT-IV	Python Object Oriented Concepts	6 Hours
----------------	--	----------------

Python Object Oriented: Overview of OOPs, Creating Classes and Objects, Class and Instance Variables, Accessing attributes, Built-In Class Attributes, Python Scopes and Namespaces, Destroying Objects, inheritance and its types.

UNIT-V	Python Regular Expressions and Exceptions Handling	8 Hours
---------------	---	----------------

Python Regular Expressions: What are regular expressions? The match Function, search Function, Matching vs. searching, Search and Replace, Extended Regular Expressions, Wildcard.

Exceptions Handling: What is Exception? Syntax Errors, Handling an exception, Raising Exceptions, try....except...else, try-finally clause, Argument of an Exception, Python Standard Exceptions, User-Defined Exceptions.

UNIT-VI	Database in Python and Data Analysis	8 Hours
----------------	---	----------------

PostgreSQL: Python PostgreSQL Database Access, Install the PostgreSQL and other Packages, Create Database Connection, CREATE, INSERT, READ, UPDATE and DELETE Operation, DML and DDL Operation with Databases, Performing Transactions

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Numpy: Introduction to numpy, Creating arrays, Using arrays and Scalars, Indexing Arrays, Array Transposition.

Pandas: What is pandas? Where it is used? Series in pandas

Lab Contents

Guidelines for Assessment

Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

List of Laboratory Assignments/Experiments (minimum -- to be covered)

1	Programs on Built-In Function, invoking built in functions, Math Functions
2	Programs on Creating, initializing and accessing the elements of strings and string operators.
3	Demonstration of List, tuples, dictionary and sets using built in methods.
4	Programs on file operations such as reading and writing to text and binary files.
5	Program demonstration on python functions, modules, packages
6	Programs on object oriented concepts using real time examples.
7	Email, mobile, name and different validations programs using regular expression.
8	Programs on exception handling concepts in python
9	CRUD operations using PostgreSQL database.
10	Demonstration on various data analysis libraries.
11	Mini Project using Python and PostgreSQL database

Text Books:

T1. Gowrishankar S, Veena A, "Introduction to Python Programming", 1st Edition, CRC Press/Taylor & Francis, 2018. ISBN-13: 978-0815394372

Reference Books:

- R1.** Jake VanderPlas, "Python Data Science Handbook: Essential Tools for Working with Data", 1st Edition, O'Reilly Media, 2016. ISBN-13: 978-1491912058
- R2.** Aurelien Geron, "Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems", 1st Edition, O'Reilly Media, 2017. ISBN – 13: 978-1491962299.
- R3.** Wesley J Chun, "Core Python Applications Programming", 3rd Edition, Pearson Education India, 2015. ISBN-13: 978-9332555365
- R4.** Miguel Grinberg, "Flask Web Development: Developing Web Applications with Python", 2nd

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Edition, O'Reilly Media, 2018. ISBN-13: 978-1491991732.

R5. Learning Python By Mark Lutz, O'Reilly Publication

R6. Programming with python, A users Book, Michael Dawson, Cengage Learning

R7. Python Essential Reference, David Beazley, Third Edition

RSCOE

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F.Y.MCA
Academic Year –2022-2023 Semester - II
[MCA221203]: Web Technology

Teaching Scheme: TH:-04Hours/Week LAB:-04Hours/Week	Credit TH : 04 LAB:02	Examination Scheme: ISE : 20Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW : 25 Marks PR : 50 Marks Total : 175 Marks
--	------------------------------------	--

Course Objective:

1. To impart the design, development and implementation of Dynamic Web Pages.
2. To develop programs for Web using Scripting Languages.
3. To Design and implement dynamic websites with good sense of designing and latest technical aspects

Course Outcome:

After successful completion of the course, students will able to:

CO1: Student will able to design various term related web designing technology like HTML.

CO2: Students will be able to apply Cascading Style Sheets on the HTML elements of web pages.

CO3: Students will be able to Implement interactive and validate web page(s) using JavaScript.

CO4: Students will be able to implement the event handling, web pages traversing using jQuery

CO5: Design MVC based application with use of Angular JS concepts like, model, controller, Directives etc.

CO6: Build Dynamic web site using server-side PHP Programming and Database connectivity.

Course Contents

UNIT-I	HTML 5	7Hours
Introduction to HTML5, What Is HTML5? Features of HTML5, Introduction to Web 2.0 and Web 3.0, History And Major Actors A Little Retrospective What Is The W3C?, What Is The WHATWG?, Getting Started With HTML5, Feature Detection, Support For Legacy Browsers, Structure of a Web Page HTML5 DOCTYPE, Page Encoding, New And Updated Elements, New Attributes Deprecated Elements And Attributes, Audio and Video, The State of Web Audio And Video Based On Plug-in, Attributes And Methods, Understanding Audio/Video Events, HTML5 Canvas, Overview Of Graphics In The Browser, Canvas Vs. SVG, Using A Canvas, Forms, Working With Paths, Drawing Straight Lines, Drawing Circles Or Arcs, Drawing Text, Drawing Images, Understanding Transforms, Translation, Rotation, Scaling.		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



UNIT-II	CSS3	8 Hours
Introducing CSS3, What is CSS3? , The History of CSS, Selectors and Pseudo Classes, Attribute Selectors, The Target Pseudo-Class, UI Element States Pseudo-Classes, Fonts and Text Effects, Fonts on the Web, Font Services, The @font-face Rule, Colors, Gradients, Background Images, and Masks, Color, The Opacity Property, Backgrounds, Transitions, Transforms and Animations, Transitions and Transforms, Embedding Media, Video Formats, Styling Video.		
UNIT-III	JavaScript	8 Hours
Introduction to JavaScript, Types of Scripts with suitable example, Control and looping structure, Various Operators in JavaScript with Example, Array its Types, Event Handling with Example, Math, Date and String objects with Example, DOM Objects, Form Validation, Dynamic effect using JavaScript.		
UNIT-IV	React State Management using Redux	8 Hours
Intro to jQuery , Need of jQuery , Advantages of jQuery , JQuery versions , Features , Retrieving Page Content , Using selectors , Using filters , Child, visibility, and content filters in jquery , Manipulating Page Content , Creating, getting, and setting content , Manipulating attributes , Inserting content , Wrapping, replacing, and removing content, Methods in jQuery 4.5 Events in JQuery, Animation in JQuery , Plugins in JQuery		
UNIT-V	Introduction to AngularJS	8 Hours
Angular JS introduction, Architecture & Features, AngularJS Expressions: Numbers, Strings, Objects, Arrays, Expressions using {{ }} and ng-bind. MVC architecture (Model, Controller). Directives: Data Binding, ng-init, ng-repeat, ng-app & ng-model directives, custom directives. Scope: \$scope, understanding the scope, \$rootScope.Filters: Adding filters to directives, Currency filter, Array filter, Custom filters.		
UNIT-VI	PHP	5 Hours
Installing and Configuring PHP, Introduction , PHP and the Web Server Architecture, PHP Capabilities , PHP and HTTP Environment Variables, PHP Language Core , Variables , Constants , Data Types , Operators , Working with Arrays, Decision Making , Flow Control and Loops, Error Handling and Reporting Considerations, Creating a Dynamic HTML Form with PHP, Database Connectivity with MySql , Connection with MySql Database , Performing basic database operations(DML) Insert, Delete, Update, Select), Using GET, POST, SESSION, and COOKIE Variables.		
Lab Contents		
Guidelines for Assessment		
Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include-timely completion, performance, innovation, efficient codes, punctuality and neatness.		

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



List of Laboratory Assignments/Experiments (minimum--to be covered)	
1	Designing web pages using various HTML tags.
2	Implementation of CSS on HTML
3	Implementation of interactive web pages with various validations using JavaScript
4	Implementation of various events handling of web pages using jQuery
5	Designing of application based on MVC architecture using Angular JS
6	Implementation of Dynamic web pages using PHP and Database connectivity

Text Books:

T1. Complete Reference wrox publication

T2. HTML, DHTML CSS AND XML by PBP Publication

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F. Y. MCA
Academic Year – 2022-2023 Semester-II
[MCA221204]: Cloud Computing

Teaching Scheme: TH: -Hours/Week : 03	Credit TH: 03	Examination Scheme: In Sem. Evaluation : 15 Marks Mid Sem. Exam : 20 Marks End Sem. Exam : 40 Marks Total : 75 Marks
--	--------------------------------	---

Course Objective:

1. Introduce the fundamental aspects of cloud computing
2. To understand the concept of Virtualization and design of cloud Services
3. Understanding the various cloud implementations and migration techniques
4. To understand the different aspects of Cloud Security
5. Demonstrate different features of cloud platforms used in Industry
6. Understand the different Application of Cloud Computing

Course Outcome:

After successful completion of the course, students will able to:

CO1. Elaborating the basic concepts of cloud computing and defining the basic terms

CO2. Identify the components of cloud computing for service perspective

CO3. Ability to understand various service delivery models of a cloud computing architecture.

CO4. In depth learning of security challenges and preventive measures in cloud computing

CO5. Explore the different cloud service Platforms.

CO6. Uses of cloud computing services in different fields

Course Contents

UNIT-I	Cloud Computing Fundamentals	06 Hours
Motivation for Cloud Computing, The Need for Cloud Computing, Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform, Principles of Cloud computing, Five Essential Characteristics, Open Challenges-Cloud Interoperability and Standards-Scalability and Fault Tolerance.		
UNIT-II	Cloud Virtualization	08 Hours
Introduction, Characteristics of Virtualized Environments, Taxonomy of Virtualization Techniques- Execution Virtualization- Other Types of Virtualization, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Examples- Xen: Paravirtualization, VMware: Full Virtualization, Microsoft Hyper-V.		
UNIT-III	Cloud Computing Architecture	08 Hours

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Introduction, Cloud Reference Model-Architecture-Infrastructure / Hardware as a Service-Platform as a Service, Four Cloud Deployment Models- Public Clouds- Private Clouds- Hybrid Clouds, Community Clouds.

UNIT-IV	Security in the Cloud	8 Hours
----------------	------------------------------	----------------

Security Overview, Cloud Security Challenges and Risks, Software-as-a-Service Security, Security Governance, Risk Management, Security Monitoring, Security Architecture Design, Data Security, Application Security, Virtual Machine Security, Identity Management and Access Control, Autonomic Security.

UNIT-V	Cloud Platforms in Industry	10 Hours
---------------	------------------------------------	-----------------

Amazon web services: Compute services, Storage services, Communication services, Additional services, Creating Account on AWS and introduction to configuring AWS Services. Google AppEngine: Architecture and core concepts, Application life cycle, Cost model Observations, Creating Account on Google App Engine and introduction to configuring Google App Engine Services.
 Microsoft Azure: Azure core concepts, SQL Azure, Windows Azure platform appliance , Observations, Creating Account on Microsoft Azure and introduction to configuring Microsoft Azure Services.

UNIT-VI	Cloud Applications	06 Hours
----------------	---------------------------	-----------------

Scientific Applications- Healthcare: ECG Analysis in the Cloud, Biology: Protein Structure Prediction, Geoscience: Satellite Image Processing, Business and Consumer Applications- CRM and ERP, Social Networking, Media Applications

Text Books :

- T1.** Dr. Kumar Saurabh, Cloud Computing Insight into New Era Infrastructure, Wiley India. Gautam Shroff, (2011) Enterprise Cloud Computing, Cambridge University Press
T2. Roger Jennings, Cloud Computing, Wiley India

Reference Books:

- R1:** Dr. Kumar Saurabh, Cloud Computing Insight into New Era Infrastructure, Wiley India. Gautam Shroff, (2011) Enterprise Cloud Computing, Cambridge University Press
R2: Roger Jennings, Cloud Computing, , Wiley India
R3: Rosenberg and Matheos, The Cloud at your service, Manning Publications

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F.Y. MCA

Academic Year – 2022-2023 Semester-II

[MCA221205A]: Internet of Things

Teaching Scheme: TH: -Hours/Week : 03	Credit TH: 03	Examination Scheme: In Sem. Evaluation: 15 Marks Mid Sem. Exam : 20 Marks End Sem. Exam : 40 Marks Total : 75 Marks
Course Objective: <ol style="list-style-type: none"> 1. Gain vision and Introduction to IoT 2. Acquire IoT Market Perspective 3. Describe IoT standards and Business Processes 4. Gain IoT Architecture 5. Have a knowledge of Real World IoT Design constraints, Industrial Automation and Commercial Building Automation in IoT 		
Course Outcome: After successful completion of the course, students will able to: CO1. Acquire objective of IoT CO2. Determine the IoT in Market Perspective CO3. Gain various devices, Gateways and Data Management through IoT CO4. Describes architecture of IoT CO5. Acquire knowledge of various IoT applications through case studies CO6. Gain the knowledge of AR and future of business		
Course Contents		
UNIT-I	Introduction	08 Hours
Introduction of M2M to IoT – The Vision, From M2M to IoT, Global Context of M2M to IoT, Various Characteristics, Needs of IoT, Transformation M2M to IoT as per Market Perspective, Value Chains of M2M, IoT, An evolving Industrial Structure of IoT, The global value chain and global information monopolies at international level		
UNIT-II	IoT Architecture An Overview	07 Hours
M2M to IoT An Architecture Introduction, Building an Architecture, Various Principles, It's Need, and various Capabilities. IoT Architecture Outline, Various Standards to be considered, Fundamentals of M2M to IoT Technology, Various Devices and Gateways, LAN and WAN, Data Management		
UNIT-III	Fundamentals of M2M &IoT	07 Hours

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Fundamentals of M2M to IoT, Various Business Processes in IoT, Everything as a Service (XaaS), Analytics: M2M to IoT, Knowledge Management, Architecture Reference Model- Introduction, Reference Model

UNIT-IV	IoT Reference Architecture	08 Hours
----------------	-----------------------------------	-----------------

Introduction to IoT Reference Architecture, Various View like Functional View, Information View, Deployment and Operational View, Other architectural views, Introduction to Real-world Design Constraints, Technical Design Constraints, Data representation and visualization, Interaction and remote control etc.

UNIT-V	IoT based Case Studies	07 Hours
---------------	-------------------------------	-----------------

Commercial Building Automation today, Commercial Building Automation in Future, Healthcare, Transportation, Smart City etc.

UNIT-VI	AR and IoT	07 Hours
----------------	-------------------	-----------------

Introduction to AR, Characteristics of AR, It's need for future business, MIXED REALITY, Hardware requirements, Data Visualization via AR, Case Studies: e-Learning, Virtual Classrooms, Training to Disable Persons, Training to Police, School Education

Text Books :

- T1.** DaCosta, Francis. Rethinking the Internet of Things: a scalable approach to connecting everything. Apress, 2013
T2. Schwartz, Marco. Internet of Things with the ArduinoYún. Packt Publishing Ltd, 2014

Reference Books:

- R1.** DaCosta, Francis. Rethinking the Internet of Things: a scalable approach to connecting everything. Apress, 2013
R2. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madiseti, Universities Press, 2015, ISBN: 9788173719547
R3. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN:9789350239759
R4. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014.
R5. Vijay Madiseti and ArshdeepBahga, "Internet of Things (A Hands-on- Approach)", 1stEdition, VPT, 2014.
R6. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013
R7. Hakima Chachi "Internet of Things (Connecting Objects)" Wiley – 2010.

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Talhane, Pune-411 033
Dr. Rakesh Jain
Director



F. Y. MCA
Academic Year – 2022-2023 Semester-II
[MCA221205B]: Design and Analysis of Algorithm

Teaching Scheme: TH: -Hours/Week : 03	Credit TH: 03	Examination Scheme: In Sem. Evaluation: 15 Marks Mid Sem. Exam : 20 Marks End Sem. Exam : 40 Marks Total : 75 Marks
--	--------------------------------	--

Course Objective:

1. To analyze performance of algorithms, Big O Notations, Sorting
2. To choose the appropriate data structure and algorithm design method for a specified application.
3. To solve problems using algorithm design methods such as the greedy method
4. To solve problems using algorithm design methods such as the divide and conquer, dynamic programming
5. To solve problems using algorithm design methods such as the Backtracking
6. To introduce the problem solving using branch and bound, various problems in P and NP classes

Course Outcome:

After successful completion of the course, students will able to:

CO1:Analyze a problem and identify the computing requirements appropriate for its solution, and to understand how the worst-case time complexity of an algorithm is defined, how asymptotic notation is used to provide a rough classification of algorithms.

CO2:Ability to design, implement, and evaluate an algorithm to meet desired needs

CO3 :Apply dynamic programming, backtracking, branch and bound strategy for problem solving

CO4 :Ability to distinguish between polynomial and non-polynomial problem solving

Course Contents

UNIT-I	Introduction	10 Hours
Algorithm, analysis, Time complexity and space complexity, O-notation, Omega notation and Theta notation, Heaps and Heap sort, Sets and disjoint set, Union and find algorithms, Sorting in linear time, Tower of Hanoi		
UNIT-II	Divide And Conquer	6 Hours
Divide and Conquer, General Strategy, Exponentiation. Binary Search, Quick Sort Merge Sort		
UNIT-III	Greedy Method	8 Hours
General Strategy, Knapsack problem, Job sequencing with Deadlines, Optimal merge patterns, Minimal Spanning Trees, Dijkstra's algorithm.		
UNIT-IV	Dynamic Programming	8 Hours

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



General Strategy, Multistage graphs, OBST, 0/1 Knapsack, Traveling Salesperson Problem, Flow Shop Scheduling

UNIT-V	Backtracking	8 Hours
---------------	---------------------	----------------

Backtracking: General Strategy, N- Queen's problem, Graph Coloring, Hamiltonian Cycles, 0/1 Knapsack

UNIT-VI	Branch and Bound, NP-HARD AND NP-COMPLETE PROBLEMS	8 Hours
----------------	---	----------------

General Strategy, 0/1 Knapsack, Traveling Salesperson Problem, Basic concepts, of NP-Hard And NP-Complete Problems (Only concepts should be covered)

Text Books :

T1. Design and Analysis of Algorithms, S. Sridhar First Ed., ISBN: 9780198093695, Oxford University Press

T2. Design And Analysis Of Algorithms, Anany Levitin, 3Rd Ed, Pearson,

Reference Books:

R1. Bressard, "Fundamental of Algorithm." PHI

R2. Horowitz/Sahani, "Fundamentals of computer Algorithms", Galgotia

R3. Magnifying Data Structures, Arpita Gopal : PHI Publications

R4. Thomas H Cormen and Charles E.L Leiserson, "Introduction to Algorithm" PHI

R5. A. V. Aho and J.D. Ullman, "Design and Analysis of Algorithms", Addison Wesley

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



F. Y. MCA

Academic Year – 2022-2023 Semester-II

[MCA221205C]: Cyber Security and Cyber Law

Teaching Scheme: TH: - 03 Hours/Week	Credit TH: 03	Examination Scheme: In Sem. Evaluation : 15 Marks Mid Sem. Exam : 20 Marks End Sem. Exam : 40 Marks Total : 75 Marks
---	--------------------------------	---

Course Objective:

Students should be able to understand

1. The difference between threat, risk, attack and vulnerability
2. How threats materialize into attacks.
3. Where to find information about threats, vulnerabilities and attacks.
4. Typical threats, attacks and exploits and the motivations behind them.
5. Cyber Laws and Risks management

Course Outcome:

On completion of the course, student will be able to–

CO1: Understand concepts of Cyber-attacks, security issues and policies.

CO2: Understand and identify cyber vulnerabilities and safeguards.

CO3: Identify and learn web security and services.

CO4: Cyber laws and international and national security policies and investigations.

CO5: Concepts of network security and cryptography

CO6: Managing security risks and planning incidents

Course Contents

UNIT-I	Introduction to Cyber Security	4 Hours
Overview of Cyber Security, CIA (Confidentiality, Integrity, Availability), Threats and Attacks: • Attacker goals, capabilities, and motivations • Malware, • Denial of service and Distributed, Denial of Service, • Social engineering, Risk, threats, vulnerabilities, and attack vectors, • Authentication and authorization, and access control (mandatory vs. discretionary), Ethics (responsible disclosure)		

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



UNIT-II	Network Security and Cryptography	10 Hours
<p>• Network specific threats and attack types, Access Control and Intrusion Detection, Server Management and Firewalls, Security for VPN and Next Generation Technologies, • Use of cryptography for data and network security • Architectures for secure networks • Defense mechanisms and countermeasures • Security for wireless, cellular networks, Introduction to Cryptography :Encryption & Decryption , Digital Signatures, Applications of Cryptography, Tools and techniques of Cryptography : Chinese Remainder Theorem and its implication in Cryptography, Diffie-Hellman key exchange algorithm, RSA algorithm, Elgamal Arithmetic, Elliptic Curve Cryptography, Message Digest and Cryptographic Hash Functions, MD5 and SHA-1, Digital Signatures and Authentication.</p>		
UNIT-III	Securing Web Application, Services and Servers	8 Hours
<p>Introduction : why web application security, importance, challenges, Web security Vs network security. Web application vulnerabilities, Broken Access Control , Broken Authentication and Session Management Buffer Overflows ,Cross Site Scripting Flaws, Denial of Service, SQL Injection Flaws, Insecure Storage, Unvalidated Input, Defensive Measures, Improper Error Handling, Insecure Configuration Management Web application security guidelines, improvement and testing.</p> <p>Basic security for HTTP Applications and Services, Basic Security for SOAP Services, Identity Management and Web Services, Authorization Patterns, Security Considerations, Challenges.</p>		
UNIT-IV	Digital Forensics	10 Hours
<p>Network Forensics: Introduction, Network basics for digital investigators: History, Technical overview, Network Technologies, Connecting networks using Internet Protocols. Applying Forensic Science to Networks: Preparation & Authorization, Identification, Documentation Collection Preservation, Filtering Data reduction, Class / Individual characteristics, evaluation of source, evidence recovery, investigation reconstruction, reporting results. Network traffic data sources: Firewalls & Routers, Packet sniffers & Protocol Analyzers, IDS, Security event management software, network forensic analysis tools. Collecting network traffic data: Legal considerations & Technical issues. Examining & Analyzing network traffic data: Identify an event of interest, Examine data sources, Draw conclusions, Mobile device Forensic and Email Forensics: Mobile Device Forensics, Types of evidence on mobile device, Handling mobile device as a sources of evidence, Forensic prevention of mobile devices, Forensic examination & analysis of mobile devices, Forensic acquisition & examination of SIM cards(Architecture, Data Storage, Files, Mobile Operating System), Investigative reconstruction using mobile devices, Mobile forensics and its challenges</p>		

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Email Forensics : E-Mail Header Analysis, Function & Forensics, Chat and Social Networking Evidence
 Web forensics and Antiforensics.

UNIT-V	IT Security Management	4 Hours
--------	-------------------------------	---------

IT Security Management : Organizational Context and Security Policy, Security Risk Assessment ,Security Controls or Safeguards , IT Security Plan, Implementation of Controls, Monitoring Risks, Physical and Infrastructure Security, Human Resources Security, Legal and Ethical Aspects: Cybercrime and Computer Crime, Intellectual Property , Privacy , Ethical Issues.

UNIT-VI	Cyberspace and the Law	6 Hours
---------	-------------------------------	---------

Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy . Laws and Ethics in Information Security, Codes of Ethics, Protecting programs and data Cybercrime and Information security, The legal perspectives- Indian perspective, Global perspective, Categories of Cybercrime, Types of Attacks, a Social Engineering, Cyber stalking, Cloud Computing and Cybercrime.

Text Books:

- T1.** Computer Security: Principles and Practices, Pearson 6 Ed, ISBN 978-0-13-335469-0, William Stalling
T2. Cyber Security- Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Wiley India Pvt.Ltd, ISBN- 978-81-265-2179-1, Nina Godbole, Sunit Belapure
T3. Cryptography and Network Security, Behrouz A Forouzan

Reference Books:

- R1.** Security in Computing, Charles P. Pfleeger Shari Lawrence Pfleeger Jonathan Margulies, 5th Edition, Pearson Education , 2015.
R2. Cyber Space and Cyber Security, George K.Kostopoulous, CRC Press, 2013
R3. Cyber Security: Analytics, Technology and Automation edited, Martti Lehto, Pekka Neittaanmäki , Springer International Publishing Switzerland 2015
R4. Computer Forensics and Investigations, Nelson Phillips and Enfinger Steuart, Cengage Learning, New Delhi, 2009.

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



- R5. Cyber Security: A Practitioner's Guide (Amazon Asia-Pacific Holdings Private Limited, 2017)
- R6. Cyber security and Cyberwar (Oxford University Press India, 2014)
- R7. Hacking with Kali Linux (Independently Published, 2018)
- R8. Avoiding the Ransom: Cyber security for Business Owners and Managers (Lulu.com, 2016)
- R9. Computer Security: Principles and Practices, Pearson 6 Ed, ISBN 978-0-13-335469-0, William Stalling
- R10. Cyber Security- Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Wiely India Pvt.Ltd, SBN- 978-81-265-2179-1, Nina Godbole, Sunit Belapure
- R11. Cryptography and Network Security, Behrouz A Forouzan

RSCOE

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



S. Y. MCA
Academic Year- 2022-2023 Semester- II
[MCA221205D]: DevOps

Teaching Scheme: TH: -Hours/Week : 03	Credit TH: 03	Examination Scheme: In Sem. Evaluation : 15 Marks Mid Sem. Exam : 20 Marks End Sem. Exam : 40 Marks Total : 75 Marks
--	--------------------------------	---

Course Objective:

Students should be able to understand

1. Understand the principles of continuous development and deployment.
2. DevOps productivity by automating infrastructure and workflows and continuously measuring applications performance.
3. Understand and use AWS Services.
4. Concepts of version control and using Git
5. Understand and use the container Technology
6. Using DevOps tools like Git, Jenkins, Ansible, Docker

Course Outcome:

On completion of the course, student will be able to–

CO1: CO2: Explain the principles of continuous development and deployment of software.

CO2: Describe DevOps & DevSecOps methodologies and their key concepts

CO3: Set up complete private infrastructure using version control systems and CI/CD tools

CO4: Use container Technology in Software development

CO5: Implement Containerization using Kubernetes, Configuration management with Ansible

CO6: Using DevOps tools like Jenkins, Git, Maven etc. in various aspects of DevOps delivery model

DevOps using Cloud and Using AWS Services □

Course Contents

UNIT-I	Introduction to DevOps	04 Hours
What is DevOps?, Why is DevOps is Needed?, How is DevOps ? Why is DevOps used?, DevOps Lifecycle, Principles, Roles, Responsibilities, and Skills of a DevOps Engineer, DevOps and Software Development Life Cycle: Waterfall Model, Agile Model		
UNIT-II	DevOps Architecture	05 Hours

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



DevOps Architecture, Deployments, Orchestration, Need, Instance of applications, DevOps delivery pipeline, DevOps eco system. DevOps adoption in projects: Technology aspects, Agiling capabilities, Tool stack implementation, People aspect, processes

UNIT-III	Continuous Integration, Delivery and Deployment	05 Hours
-----------------	--	-----------------

CI/CD: Introduction to Continuous Integration, Continuous Delivery and Deployment , Benefits of CI/CD, Metrics to track CICD practices . Devops Maturity Model: Key factors of DevOps maturity model, stages of Devops maturity model, DevOps maturity Assessment

UNIT-IV	Container Technology	09 Hours
----------------	-----------------------------	-----------------

Container Technology - Introduction to Containers? Benefits of Contain Containers Work?, Virtual Machines vs Containers, brief intro to Container Terminology, Overview of Container Architecture, Installing Container engine tool, Creating Containerized Services, Provisioning Containerized Services, Manipulating Container Images Creating Custom Container Images - Designing Custom Container Images, Building Custom Container Images with Dockerfile.

UNIT-V	Containerization and Configuration Management	08 Hours
---------------	--	-----------------

Configuration management with Ansible - Introduction to Ansible, Ansible Installation, Configure Ansible roles, write, Playbooks, working with playbooks, manage ansible variables, Executing Adhoc command, Ansible Variables. Containerization using Kubernetes- Introduction to Kubernetes engine, Kubernetes Cluster Architecture, understanding YAML, creating a services in Kubernetes.


UNIT-VI	DevOps Tools	09 Hours
----------------	---------------------	-----------------

Introduction to Jenkins with Architecture, Jenkins Management, Introduction to Maven, Introduction to Git: What is Git, Why Git, GIT, Workflow. DevOps on Cloud: Why Cloud, Introduction to Cloud Computing, Why DevOps on Cloud, Introduction to AWS, Various AWS services, DevOps using AWS.

Text Books :

- T1.** The DevOPS Handbook: How to Create World-Class Agility, Reliability, and Security in Technology Organizations by Gene Kim , John Willis , Patrick Debois , Jez Humb,O'Reilly publications
- T2.** What is Devops? Infrastructure as code By in Mike Loukides ,O'Reilly publications.


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



T3. Continuous Delivery: Reliable Software Releases Through Build, Test, and Deployment Automation, by Jez Humble and David Farley

T4. Achieving DevOps: A Novel About Delivering the Best of Agile, DevOps, and Microservices by Dave Harrison, Knox Lively

Reference:

R1: DevOps For Dummies 2nd IBM Limited Edition by Sanjeev Sharma and Bernie Coyne

R2: DevOps_Revealed_by_International_DevOps_Certification_Academy.

R3: Effective DevOps by Jennifer Davis & Katherine Daniels.

R4: The DevOps Handbook_ How to Create World Class Agility, Reliability, and Security in Technology Organizations.

RSCOE

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F.Y. MCA
Academic Year –2022-2023 Semester-II
[MCA221205E]: Block Chain Technology

Teaching Scheme: TH: -Hours/Week : 03	Credit TH:03	Examination Scheme: In Sem. Evaluation:15 Marks Mid Sem. Exam :20 Marks End Sem. Exam : 40 Marks Total : 75Marks
--	-------------------------------	---

Course Objective:

1. To provide conceptual understanding of block chain technology
2. To acquire skills to develop block chain based solutions
3. To familiarize potential applications for Bit coin-like crypto currencies
4. To develop & integrate ideas from various domains and implement the technology in different perspectives
5. The course will enable an individual to learn, how these systems work and how to develop secure software that interacts with the Bit coin network and other crypto currencies

Course Outcome:

After successful completion of the course, students will able to:

- CO1.** Understand the types, benefits and limitation of block chain
CO2. Explore the block chain decentralization and cryptography concepts
CO3. Apply the tools for understanding the background of crypto currencies
CO4. Build and deploy block chain application for on premise and cloud based architecture
CO5. Identify major research challenges and technical gaps existing between theory and practice in
 crypto currency domain
CO6. Understanding of latest advances and its applications in Block Chain Technology

Course Contents

UNIT-I	Block Chain Fundamentals	06 Hours
Block chain 101: Distributed systems, History of block chain, Introduction to block chain, Types of block chain, CAP theorem and block chain, Benefits and limitations of block chain.		
UNIT-II	Decentralization and Cryptography Fundamentals	08 Hours
Decentralization and Cryptography: Decentralization using block chain, Methods of decentralization, Routes to decentralization, Decentralized organizations. Cryptography and Technical Foundations: Cryptographic primitives, Asymmetric cryptography, Public and private keys.		
UNIT-III	Bit Coin	09 Hours

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Bit coin - Wallet - Blocks - Merkle Tree - hardness of mining - transaction verifiability - anonymity - forks - double spending - mathematical analysis of properties of Bit coin. Bitcoin block chain, the challenges, and solutions, proof of work, Proof of stake, alternatives to Bitcoin consensus, Bitcoin scripting language and their uses with examples.

UNIT-IV	Bitcoin and Block chain	09 Hours
----------------	--------------------------------	-----------------

Bitcoin and Block chain: Creation of coins, Payments and double spending, Bitcoin Scripts, Bitcoin P2P Network, Transaction in Bitcoin Network, Block Mining, Block propagation and block relay Working with Consensus in Bitcoin: Distributed consensus in open environments, Consensus in a Bitcoin network, Proof of Work (PoW) -basic introduction, Hashcash PoW, Bitcoin PoW.

UNIT-V	Ethereum	09 Hours
---------------	-----------------	-----------------

Ethereum - Ethereum Virtual Machine (EVM) - Wallets for Ethereum - Solidity - Smart Contracts - some attacks on smart contracts. Ethereum and Smart Contracts- The Turing Completeness of Smart Contract Languages and verification challenges- comparing Bitcoin scripting vs. Ethereum Smart Contracts

UNIT-VI	Block Chain-Recent Trend	08 Hours
----------------	---------------------------------	-----------------

Block chain Implementation Challenges- Zero Knowledge proofs and protocols in Block chain - Succinct non interactive argument for Knowledge (SNARK) - pairing on Elliptic curves – Zcash - attacks on Block chains – such as Sybil attacks, selfish mining, 51% attacks - -advent of algorand, and Sharding based consensus algorithms


Text Books :

- T1.** Mastering Blockchain by Imran Bashir Packt Publishing Ltd. ISBN 978-1- 78883-04-4
- T2.** Melanie Swan, “Block Chain: Blueprint for a New Economy”, O’Reilly, first edition – 2015.
- T3.** Anshul Kaushik, “Block Chain and Crypto Currencies”, Khanna Publishing House, Delhi.
- T4.** Imran Bashir, “Mastering Block Chain: Distributed Ledger Technology, Decentralization and Smart Contracts Explained”, Packt Publishing, first edition – 2012

Reference Books:

- R1:** Ritesh Modi, “Solidity Programming Essentials: A Beginner’s Guide to Build Smart Contracts for Ethereum and Block Chain”, Packt Publishing
- R2:** Imran Bashir, “Mastering Block Chain: Distributed Ledger Technology Decentralization and Smart Contracts Explained”, Packt Publishing
- R3:** Mastering Bitcoin: Unlocking Digital Cryptocurrencies, Andreas M. Antonopoulos, O’Reilly Media, First Edition, 2014
- R4:** Bitcoin and Cryptocurrency Technologies, Author- Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfeder, Princeton University, 2016


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



F. Y. MCA
Academic Year 2022-2023 Semester- II
[MCA221205F]: Big Data Analytics

Teaching Scheme: TH: - 03 Hours/Week	Credit TH: 03	Examination Scheme: In Sem. Evaluation : 15 Marks Mid Sem. Exam : 20 Marks End Sem. Exam : 40 Marks Total : 75 Marks
---	--------------------------------	---

Course Objective:

1. Optimize business decisions and create competitive advantage with big data analytic.
2. The several key big data technologies used for storage, analysis and manipulation of data.
3. The key concepts of Hadoop framework and map reduce.
4. The concepts of PIG and HIVE for application development.

Course Outcome:


After successful completion of the course, students will able to:

- CO1.** Understand the basic concepts of Big Data and Technology used in the same
- CO2.** Understand the Hadoop technology and its implementation and Hadoop file distribution System
- CO3.** Understand the Basic aspects of the Map reduce Functions
- CO4.** Understand the Basic aspects of the Pig and Hive technology used for the operations on HDFS

Course Contents

UNIT-I	INTRODUCTION TO BIG DATA	9 Hours
Introduction to Big data: Characteristics of Data, Evolution of Big Data, Definition of Big Data, Challenges with Big Data, Traditional Business Intelligence (BI) versus Big Data. Big data analytics: Classification of Analytics, Importance and challenges facing big data, Terminologies Used in Big Data Environments, The Big Data Technology Landscape.		
UNIT-II	INTRODUCTION TO HADOOP	9 Hours
Introducing Hadoop, RDBMS versus Hadoop, Distributed Computing Challenges, History and overview of Hadoop, Use Case of Hadoop, Hadoop Distributors, Processing Data with Hadoop, Interacting with Hadoop Ecosystem.		


Prof. Rinku Dullo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



UNIT-III	THE HADOOP DISTRIBUTED FILE SYSTEM	9 Hours
Hadoop Distributed File System (HDFS): The Design of HDFS, HDFS Concepts, Basic Filesystem Operations, Hadoop Filesystems.		
The Java Interface- Reading Data from a Hadoop URL, Reading Data Using the File system API, Writing Data. Data Flow- Anatomy of a File Read, Anatomy of a File Write, Limitations.		
UNIT-IV	UNDERSTANDING MAP REDUCE FUNDAMENTALS	9 Hours
Map Reduce Framework: Exploring the features of Map Reduce, Working of MapReduce, Exploring Map and Reduce Functions, Techniques to optimize MapReduce jobs, Uses of MapReduce .Controlling MapReduce Execution with Input Format, Reading Data with Custom Record Reader, -Reader, Writer, Combiner, Partitioners, MapReduce Phases, Developing simple MapReduce Application.		
UNIT-V	INTRODUCTION TO PIG AND HIVE	9 Hours
Introducing Pig: Pig architecture, Benefits, Installing Pig, Properties of Pig, Running Pig, Getting started with Pig Latin, working with operators in Pig, Working with functions in Pig. Introducing Hive: Getting started with Hive, Hive Services, Data types in Hive, Built-in functions in Hive, Hive DDL.		
Text Books: T1. Seema Acharya, Subhashini Chellappan, Big Data and Analytics, Wiley Publications, 2nd Edition, 2014, DT Editorial Services, Big Data, Dream Tech Press, 2nd Edition, 2015. T2. Tom White, Hadoop: The Definitive Guide, O „Reilly, 3rd Edition, 2012. T3. Black Book Big Data, Dream tech publications, 1st Edition, 2017.		
Reference Books: R1. Michael Minelli, Michele Chambers, Ambiga Dhiraj, Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today „s Business, Wiley CIO Series, 1st Edition, 2013. R2. Rajiv Sabherwal, Irma Becerra- Fernandez, “Business Intelligence Practice, Technologies and Management”, John Wiley, 1st Edition, 2011. R3. Arvind Sathi, “Big Data Analytics: Disruptive Technologies for Changing the Game”, IBM Corporation, 1st Edition, 2012.		
Web References: 1. https://www.sas.com/en_us/insights/analytics/big,data,analytics.html 2. https://www.searchbusinessanalytics.techtarget.com/definition/big,data,analytics 3. https://www.webopedia.com		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



F.Y. MCA
Academic Year – 2022-2023 Semester- II
[MCA221205G]: Research Methodology

Teaching Scheme: TH: 03 Hours/Week	Credit TH: 03	Examination Scheme: In Sem. Evaluation : 15 Marks Mid Sem. Exam : 20 Marks End Sem. Exam : 40 Marks Total : 75 Marks
---	--------------------------------	--

Course Objective:

1. Introduction to philosophy of research.
2. Understand process to formulate research questions / idea
3. Understand process of planning of research time, resource
4. Understand different statistical analysis methods
5. Develop thesis and report writing.

Course Outcome:

After successful completion of the course, students will able to:

- CO1: Knowledge on various kinds of research questions and research designs
- CO2: Formulate research problems (task) and develop a sufficiently coherent research design
- CO3: Assess the appropriateness of different kinds of research designs
- CO4: Knowledge on qualitative, quantitative and mixed methods of research, as well as relevant ethical and philosophical considerations
- CO5: Develop independent thinking for critically analyzing research reports

Course Contents

UNIT-I	Research Foundation	8 Hours
What is Research, Objectives of Research, Types of Research, Scientific Research, Research and Theory, Conceptual and theoretical Models, Importance of research Methodology in scientific research.		
UNIT-II	Review of Literature	8 Hours
Need for Reviewing Literature, What to Review and for what purpose, Literature Search Procedure, Sources of Literature, Planning of Review work, Note Taking, Library and		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director





JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



documentation		
UNIT-III	Planning of Research	9 Hours
The planning process, Selection of a Problem for Research, Formulation of the Selected Problems, Hypothesis formation, Measurement, Research Design/Plan		
UNIT-IV	Processing of Data and Statistical Analysis of Data	9 Hours
Introduction to Statistical Software, MINITAB, Weka, Measures of Relationship, Simple Regression Analysis, Multiple Correlation and Regression, Partial Correlation, Neural Network based optimization, Optimization of fuzzy systems, Error Analysis, Results and their discussions		
UNIT-V	Report and Thesis writing	8 Hours
Types of Reports, Planning of Report Writing, Research Report Format, Principles of Writing, Data and Data Analysis Reporting in a Thesis, Use of Endnote, Bibliography, API, appendix, table, Observations arrangement, Preparation of type script and lay-out of thesis, Use of LATEX Indexing of Journals, Impact factor and social Media for Researchers.		
References: R1. Research Methodology: Methods and Techniques by C. R. Kothari, New Age R2. Statistical Methods for Research Workers by Fisher R. A., Cosmo Publications, New Delhi ISBN:81- 307-0128-6 R3. Design and Analysis of Experiments by Montgomery D.C. (2001), John Wiley, ISBN: 0471260088 R4. MINITAB online manual R5. Methodology of Research in Social Sciences by O. R. Krishnaswamy and M. Rangnatham Himalaya publication House, 2005, ISBN: 8184880936 R6. Weka online manual		


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



F. Y. MCA

Academic Year – 2022-2023 Semester-II

[MCA221205H]: Entrepreneurship Development

Teaching Scheme: TH: -Hours/Week : 03	Credit TH: 03	Examination Scheme: In Sem. Evaluation: 15 Marks Mid Sem. Exam : 20 Marks End Sem. Exam : 40 Marks Total : 75 Marks
--	--------------------------------	--

Course Objective:

1. To develop and strengthen entrepreneurial quality in students. and motivation
2. To develop and strengthen motivation quality in students
3. To impart basic entrepreneurial skills
4. To impart understandings to run a business efficiently and effectively.

Course Outcome:

- CO1. After successful completion of the course, students will able to:
- CO2. Students will gain the Knowledge of Entrepreneurship and will get the competence
- CO3. Students will gain skills needed to run a business.
- CO4. Students will gain knowledge needed to run a business

Course Contents

UNIT-I	Entrepreneurial Competence	08 Hours
Entrepreneurship concept, Entrepreneurship as a Career, Entrepreneurial Personality, Characteristics of Successful, Entrepreneur, Knowledge and Skills of Entrepreneur		
UNIT-II	Entrepreneurial Environment	08 Hours
Business Environment, Role of Family and Society, Entrepreneurship Development Programmes, Government Policies for Small Scale Enterprises, Small Enterprises in International Business		
UNIT-III	Business Plan Preparation	08 Hours
Sources of Product for Business, Pre-feasibility Studies, Criteria for Selection Process, Ownership Structure, Capital, Budgeting Project Profile Preparation, Matching Entrepreneur with the Project, Feasibility Report Preparation and Evaluative Criteria		
UNIT-IV	Launching of Small Business	08 Hours
Financial Planning, Human Resource mobilization, Production and Operation Management, Marketing and Channel Selection, Growth strategies in small business, Product Launching, Incubation, IT startups		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Monitoring and Evaluation of Business, Industrial Sickness, Effective Management of small Business

UNIT-VI

Rules and Legislation

07 Hours

Applicability of Legislation, Industries Development (Regulations) Act, 1951, Factories Act, 1948., The Industrial Employment (Standing Orders) Act, 1946, -Suspension-Stoppage of work, Environment (Protection) Act, 1986,


Text Books:

- R1. Arya Kumar. Entrepreneurship. Pearson. 2012
R2. Donald F Kuratko, T.V Rao. Entrepreneurship: A South Asian perspective. Cengage Learning. 2012

Reference Books:

- R1. Mathew Manimala, Entrepreneurship Theory at the Crossroads, Paradigms & Praxis,
R2. Biztrantra ,2nd Edition ,2005
R3. Prasanna Chandra, Projects – Planning, Analysis, Selection, Implementation and Reviews,
R4. Tata McGraw-Hill, 1996.
R5. P.Saravanavel, Entrepreneurial Development, Ess Pee kay Publishing House, Chennai -1997.


Prof. Rinku Dullo
Chairman BOS


Dr. Ram Joshi
Dean Academics


PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarsi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



F. Y. MCA
Academic Year – 2022-2023 Semester-II
[MCA221206]: Gateway to Industry

Teaching Scheme: PR: -Hours/Week : 02	Credit PR: 01	Examination Scheme: TW Evaluation : 25 Marks Total : 25 Marks
--	--------------------------------	--

Course Objective:


1. Enhance the problem-solving skills and Improve the basic mathematical skills and to help students who are preparing for any type of quantitative examinations.
2. Learn to count alphabets and see what we can do with them and Arithmetical Reasoning checks the capacity to adjust to the changing patterns among various arithmetic relations.
3. Exploring the reasoning ability on Calendar and Clock test and coding, decoding
4. Learn building the series or Series Completion and able to drawn conclusion from given or assumed propositions (premises).
5. Acquiring the knowledge on basics of programming, oops, data structure and database.

Course Outcome:

After successful completion of the course, students will able to:

- CO1:** Determine the methods to solve the number system problems, Ratio, Percentage etc.
- CO2:** Express proficiency problem solving like Mixtures & Alligations, Profit & Loss, Simple Interest & Compound Interest, Sequence & Series and Mensuration.
- CO3:** Determine the various methods to solve the problems on alphabet test, arithmetical and reasoning and proficiency in problem solving like Calendar, Clock Test and Coding-Decoding Data Sufficiency.
- CO4:** Building ability to solve various series problems and Syllogism and Efficiency in detect different Analogies and builds problem solving ability of blood relations and verbal reasoning.
- CO5:** Gain the knowledge of fundamental concepts of C, C++ programming to develop the programming Logic with object oriented concepts.
- CO6:** Exploring the efficiency in data structure and database concepts used for developing the various applications.


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Course Contents

UNIT-I	Number Systems, Time and Distance	3 Hours
Number Systems, Ratio & Proportion, Percentage & Averages, Mixtures & Alligations, Surds & Indices, Time & Distance.		
UNIT-II	Profit & Loss and Sequence & Series	4 Hours
Profit & Loss, Simple Interest & Compound Interest, Sequence & Series, Permutation Combination & Probability.		
UNIT-III	Alphabet Test, Arithmetical Reasoning Calendar, Clock Test	4 Hours
Alphabetical Order, Letter-Word Test, Word Formation Test, Alphabetical Quibble, Rule-Detection Test, Data Relations, Venn Diagram, Calendar Test, Clock Test, Letter-Letter Coding, Letter-Number Coding, Number-Number Coding, Coding-Decoding Puzzles.		
UNIT-IV	Data Sufficiency, Series Completion & Syllogism, Blood Relations and Verbal Reasoning	5 Hours
Data Sufficiency, Direction Sense Test, Decision Making Test, Logical Sequence of Words, Alphabet Series, Alpha-Numeric Series, Letter Repeating Series, Double Lineup, Number Ranking, Letter & symbol series, Missing Terms in Figures, Number Series, Four, Three and Two Premise Arguments Alphabet Analogy, Analogous Pairs, Non-Verbal Analogy, Number Analogy, Coded Relations, Jumbled Relations, Relation Puzzle, Selecting Words, Spotting Errors		
UNIT-V	Programming Basics Concepts	4 Hours
Pointer, call by reference vs. call by value, bitwise operators, functions, dynamic memory allocation, storage classes in c, file handling, OOP's Concepts, Interfaces, Abstract Class, this, super keyword, collection framework.		
UNIT-VI	Data Structure and Database	5 Hours
Data Structure: Linked List, Tree, Binary Tree, Stack, Queue, Graph, Searching, Sorting Database: DDL, DML, Joins, Nested Queries, PL/Sql: Functions, Procedures, Triggers, and Cursors		
Text Books: T1. Quantitative Aptitude by Dr. R. S. Aggrawal T2. The C++ Programming Language – Bjarne Stroustrup		
Reference Books: R1. A Modern Approach to Verbal & Non-Verbal Reasoning by Dr. R. S. Aggrawal R2. Analytical Reasoning by M.K Pandey R3. Multi-Dimensional Reasoning by Mishra & Kumar Dr. Lal R4. A new approach to Reasoning by B.S. Sijwali & S. Sijwali Arihant R5. Effective C++ - Scott Meyers R6. The C Programming Language – Dennis Ritchie R7. Let Us C – Yashavant Kanetkar		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



F. Y. MCA
Academic Year – 2022-2023 Semester-II
[MCA221207]: Professional Communication Skills

Teaching Scheme: PR: -Hours/Week : 02	Credit PR: 01	Examination Scheme: TW Evaluation : 25 Marks PR Evaluation : 25 Marks Total : 50 Marks
--	--------------------------------	---

Course Objective:

1. Understand the role of communication in personal & professional success.
2. Develop awareness of appropriate communication strategies.
3. To enhance the verbal communication of students.
4. To focus on Formal and Informal Conversation, etiquettes. .
5. Ethically use, document and integrate sources.
6. Practice critical thinking to develop innovative and well-founded perspectives related to the Student's emphases.
7. Use technology to communicate effectively in various settings and contexts.
8. Demonstrate appropriate and professional ethical behavior.

Course Outcome:

After successful completion of the course, students will able to:

CO1: Understand and apply effective communication methods and Listening skills.

CO2: Display competence in oral, written, and visual communication.

CO3: Respond to industry professionals and recruiters and effectively answer interview questions, and clearly understand what to do before, during and after an interview.

CO4: Demonstrate positive group communication exchanges.

CO5: Display competence in written communication and use current technology related to the communication field

CO6: Respond effectively to cultural communication differences and communicate ethically

Course Contents

UNIT-I	Communication Skills	04 Hours
Communication: Meaning, Nature, Importance and Purpose of Communication, Types of Communication, Process of Communication, Communication Network in an Organization, Strategy for Effective Communication, Verbal and Non-Verbal Communication, Barriers to Communication, Essentials of Good Communication, Communication Techniques. Listening: The Process of Listening, Barriers to Listening, Types of Listening, Purpose of Listening, Listening to Conversation (Formal and Informal) , Active Listening- an Effective Listening Skill , Benefits of Effective Listening , Barriers to Listening , Listening to Announcements- (railway/ bus stations/ airport /sports announcement/ commentaries etc.), Academic Listening (Listening to Lectures) , Listening to Talks and Presentations , Note Taking Tips. Various Class activities should be conducted		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director




JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



for more practical exposure.

UNIT-II	Body Language	10 Hours
Body Language : 1.Communicating with Your Body-Interpret a New Language, The Power of Para verbal Communication, Bodies Speak Louder than Words 2.How to Read Body Language- Head Movement, Translate Gestures into Words, Open vs. Closed Body Language, Watch Eye Movement 3.Body Language Assumptions-Common Postures, Personal Space Invasion, Reactive Movements, Fidgeting and Boredom 4.Male vs. Female Variations- Facial Expressions by Gender, Personal Space Differences, Common Female Body Language, Common Male Body Language 5.Nonverbal Signals- Gestures and Hand Signals, Sending Signals to Others, It's ,Not What You Say, It's How You Stand, What is Your Posture Communicating? 6. Facial Expressions- Emotions Displayed, Micro-Expressions, Facial Action Coding System (FACS), Universal Facial Expressions 7. Body Language in the Workplace-Communicate with Power, Cultural Differences, Building Rapport and Trust, Using Mirroring 8.Are They Lying? - Hand Movements, Forced Smiles, Eye Movement, Changes in Posture 9. Using Body Language- Becoming Aware of Your Signals, Communicating with Confidence, Posturing Explained, Practicing in the Mirror 10.Match Your Words with Your Body- Involuntary Movements, Say What You Mean, Staying Consistent, Actions Will Trump Words		
UNIT-III	Interview and Presentation skills	08 Hours
Interview Skills: Preparing for the Job Interview: Importance and Factors Involving Job Interview; Characteristics of Job Interview; Job Interview Process, How you should prepare for a job interview, find out about companies, overcome nerves, decide which clothes to wear, vocabulary about your hard and soft skills, and answering questions using the STAR technique, Job Interview Techniques-Manners and etiquettes to be maintained during an interview Answering Interview Questions: Sample Questions Commonly asked During Interview, Avoiding mistakes during the interview, tips to help you answer questions effectively and confidently, understanding the importance of non-verbal communication during interviews, and the importance of intonation. Responding to Challenging Interview: Questions Answering those challenging interview questions, being able to stand out during interviews, providing diplomatic answers to questions you would prefer had not been asked and giving yourself time to come up with an answer, and stressing key words in your replies, Critical Success Factors for Interview, Negotiating Salary & Compensation. Closing the Job Interview Effectively: Post Interview and Online Interviews Considering the questions that you, the interviewee should ask, or not ask, deciding what you should do, or not do at the end of the interview, and after the interview, and discovering how online interviews are similar and different to face to face interviews, Post-Interview & Follow-up. Mock Interviews should be conducted. Presentation Skills: Preparing a PowerPoint Presentation, Greeting and introducing, Presenting a Paper, Group Discussions. Preparing for and Facing a Job Interview		
UNIT-IV	Group Discussion Preparation	10 Hours


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



GD Introduction: What is a Group Discussion?, Who holds a Group Discussion?, How is a GD Conducted? Why is a "GD" conducted?, Why GD is important?, GD: Approach (Carefully craft the opening gambit, Use Key Word Approach, Apply Shock Strategy GD: Do's and Don'ts, GD: Communications, Types of GD topics: Techniques, GD: Etiquette, GD: Content Discuss Solved Case Studies and Conduct GD in Class on different topics, Experience sharing by Industry people & Alumni

UNIT-V	Written communication	04 Hours
--------	-----------------------	----------

Elements of Effective Writing (What is Writing?), Main Forms of Written Communication, Letter Writing (formal and informal), Applying for a job (Preparing Cover letters, Preparing a CV/Resume and Effective Profiling), Summarizing (Précis Writing, Note-making, Preparing Agenda and Minutes for Meetings), Writing Notices and Memos, Drafting an E-mail, Press Release, Correspondence with Govt./Authorities, Office Orders, Enquiries and Replies)

UNIT-VI	Grooming for Career Building	04 Hours
---------	------------------------------	----------

Telephone Skills : Basics of Telephone communication • How to handle calls- telephone manners • Leaving a message • Greeting and Leave Taking over phone (etiquette).

Time & Stress Management: Identifying Time Wasters • Time Management Tips • Identifying Factors Responsible for Stress • Stress Management Tips • Test Preparation Tips.

Soft Skills for Leadership and Team Management: Qualities of a Good Leader • Leadership Styles • Decision Making • Intrapersonal skills • Interpersonal skills • Problem solving • Critical thinking • Negotiation skills.

List of Laboratory Assignments/Experiments (to be covered)

1	Understanding and implementation of effective communication and Listening skills
2	Implementation in oral, written, and visual communication
3	Implementation of Interview skills
4	Group communication exchanges
5	Written communication and use current technology related to the communication field
6	Implementation effectively to cultural communication differences and communicate ethically

Reference Books:

R1: Communicating at work: Strategies for success in business and the professions: Adler, Elmhurst, & Lucas (2013). NE: McGraw Hill.

R2: The Definitive Book of Body Language Allan Pease

R3: The Art of Public Speaking by Dale Carnegie

R4: On Writing Well: The Classic Guide to Writing Nonfiction by William Zinsser

R5: Five Stars: The Communication Secrets to Get from Good to Great (Hardcover) by Carmine Gallo

Weblinks:

W1: www.google.com

W2: www.citehr.com

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



S.Y. MCA

Academic Year – 2023-2024 Semester-III

[MCA222101]: Advanced Database & Knowledge Mining

Teaching Scheme: TH: -Hours/Week : 04 LAB:-04 Hours/Week	Credit TH : 04 PR :02	Examination Scheme: In Sem Evaluation : 20 Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW Evaluation : 25 Marks PR Evaluation : 50 Marks Total : 100 Marks
---	--	---

Course Objective:

1. Giving insights on text database, graph database, semi- structured data.
2. Introducing the concepts of object oriented databases & its applications.
3. Understanding the application and its benefits of data and databases.
4. Designing & understanding of parallel systems and its applications.
5. Understanding the data mining real applications.

Course Outcome:

After successful completion of the course, students will able to:

- CO1: Identify information retrieval and associated processes from text database.
- CO2: Differentiate Graph based database from relational database.
- CO3: Describe semi-structured data and XML.
- CO4: Review object-oriented databases.
- CO5: Learn object-relational databases concept and its applications.
- CO6: Characterize Parallel databases and its usage.
- CO7: Overview of real application of data mining.

Course Contents

UNIT-I	Text databases	6 Hours
Text databases: Information retrieval - overview, Relevance ranking using terms and hyperlinks, synonyms, homonyms, ontologies, Indexing of documents, measuring retrieval effectiveness, web search engines, Information retrieval and structured data. Implementation issues of Relevance ranking Algorithm. Document Retrieval Strategies for Any-k Queries.		
UNIT-II	Graph based database	9 Hours

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Graph based database: What is graph based database, comparison of relational and graph based database. GraphDB vs. NOSql. Overview of open source graph database like Neo4g etc. APIs and graph query-programming languages. Databases on the Web and Semi Structured Data: Introduction, Structure of XML Data, XML Document Schema, DTD, Querying and Transformation: XQuery, FLOWR, XPath, XML validation, Web server, API to XML, Storage of XML Data, XML

UNIT-III	Object Oriented data base	7 Hours
-----------------	----------------------------------	----------------

Object oriented data base: Overview of Object–Oriented Concepts. Object Identity, Object Structure, and Type Constructors, Encapsulation of Operations, Methods, and Persistence, Type Hierarchies and Inheritance, Type extents and Queries, Complex Objects; Database Schema

UNIT-IV	Design for OODBMS & Object Relational and Extended Relational Databases	8 Hours
----------------	--	----------------

Design for OODBMS; OQL, Persistent Programming Languages; OODBMS Architecture And Storage Issues; Transactions and Concurrency control. Example of ODBMS. Object Relational and Extended Relational Databases: Database Design For An ORDBMS –Storage Issues; Transactions and Concurrency control. Example of ODBMS. (Overview)Database Design For An ORDBMS –Nested Relations and Collections; Storage And Access methods, Query processing and Optimization

UNIT-V	Parallel databases	7 Hours
---------------	---------------------------	----------------

Parallel databases: introduction, Parallel database architecture, speedup, scale-up I/O parallelism, Inter-query and Intra-query parallelism, Inter-operational and Intra-operational parallelism, parallel query evaluation, Design of parallel systems, Implementation issues of Parallel query evaluation, Design of parallel systems, Comparison of Inter-query and Intra-query parallelism.

UNIT-VI	Data Mining Applications	8 Hours
----------------	---------------------------------	----------------

Case studies in building business environment , Applications in telecommunications industry, retail, target marketing, fraud protection, health care, science, ecommerce , banking and finance.

Lab Contents


Guidelines for Assessment

Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

List of Laboratory Assignments/Experiments (minimum -- to be covered)

1	Introduction to graphs based query language using neo4j, implementation of graph queries.
2	MySQL database - creation and manipulation.
3	Creation of ER model.


Prof. Rinku Dooloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



4	Implement the database using MySQL and manipulate tables.
5	Converting the ER model to schema diagram.
6	Implement the front end pages.
7	Implement server side pages.
8	Object oriented database and queries.

Text Books:

T1. Data mining and knowledge discovery handbook, Second edition , Springer, ODED MAIMON, LIOR ROKACH

T2. Data Mining Introductory and advanced topics- Margaret Dunham, Prentice Hall

Reference Books:

R1. Alexis Leon, Mathews Leon, (leon press), Database Management System.

R2. AviSilberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts, Sixth Edition

R3. Data Ware housing: Concepts, Techniques, Products and Applications, C.S.R. Prabhu, Prentice Hall of India, 2001

R4. Vikram Vaswani , MySQL™ : The complete reference

R5. Berg Craig, SQL for beginners: SQL made easy: A step-by-step guide to SQL programming for the Beginner, Intermediate and Advance users

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarsi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



S.Y. MCA
Academic Year – 2023-2024 Semester-III
[MCA222102A]: Advanced Development Technology

Teaching Scheme: TH: - Hours/Week : 04 PR: -Hours/Week : 04	Credit TH: 4 PR: 2	Examination Scheme: In Sem. Evaluation : 20 Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW Evaluation : 25 Marks PR Evaluation : 50 Marks Total : 175 Marks
--	---	--

Course Objective:

1. Explain how C# fits into the .NET platform and analyse the basic structure of a C# and ASP Application.
2. Describe the object oriented aspects of C#.
3. Develop applications using ASP .Net using C#.
4. Design and develop Web based applications on .NET
5. Describe the foundations of CLR execution.
6. Describe the developing the MVC Applications and Ajax controls on web form.

Course Outcome:

After successful completion of the course, students will able to:

- CO1: Gain a comprehensive understanding of the philosophy and architecture of C-Sharp Programming
- CO2: Learn how to implement object oriented concepts using c# and implementation of delegate and Exception handling.
- CO3: Attain a detailed knowledge of the building blocks of web applications using web forms, Including Programs that interact With databases.
- CO4: Develop Rich Internet Web applications by using C#, ASP.NET, ADO.NET
- CO5: Determine to Deploy web application using ADO.NET and learning to use of web services
- CO6: Express proficiency in handling of Ajax on web forms and creating MVC applications used for Web Development

Course Contents

UNIT-I	Introduction .NET Framework 4.0	7 Hours
Benefits of .NET Framework, Architecture of .NET Framework 4.0, Components of .NET Framework 4.0: CLR, CTS, Metadata and Assemblies, .NET Framework Class Library, . ASP .Net Architecture, Processing of an application in .Net, Namespace Fundamentals, Maintaining State Information Introducing C#: overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, implicit and explicit casting, Constant, Arrays, Array List, Enumerations, boxing and unboxing.		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



UNIT-II	Object Oriented aspect of C#	7 Hours
OOPs concepts, The System namespace, Access Modifiers, Static Classes and Static Class Members. Static Property, Polymorphism/Overloading, Runtime Polymorphism/Overriding. Abstraction: Abstract classes, Abstract methods. Interfaces: Syntax of Interfaces, Implementation of Interfaces and Inheritance. Delegates: Creating and using. Multicasting with Delegates, Exception Handling: The try/catch/finally statement, Checked and Unchecked Statements. Chained exceptions, using exceptions.		
UNIT-III	Creating a User Interface (Controls and Master Page)	9 Hours
Using Controls-: Validation Controls, Navigation between Pages, Master Pages & Themes, Simple Master Page Nested Master Page Configuring Master Page Creating Themes, Applying Themes, Applying Style sheet. Data Binding -: Bind data to UI, Transform and filter Data.		
UNIT-IV	Storing and Retrieving Data with ADO.NET, Catching and Correcting Errors	8 Hours
Accessing Data with ADO.NET, Using Data Sets on Web Forms, Processing Transactions, CRUD operations using SQL-Server. Using Exception Handling-: Using Error Pages, Logging Exceptions		
UNIT-V	Web Services, Testing Web Applications & Building and Deploying Web Applications	7 Hours
Web Services -: Creating Web Services, Discovering Web Services, Instantiating and Invoking Web Services, Testing Web Applications -: Creating Tests, Running Tests, Debugging, Building and Deploying -: Building a Web Application, Deploying a Web Application authenticating and Authorizing Users using windows and forms		
UNIT-VI	Use of Ajax and Introduction to MVC	7 Hours
Ajax -: Introduction to Ajax Controls, Using various Ajax controls on web forms. Introduction to MVC -: MVC Architecture, MVC- Model, Views, Controllers, Creating Simple MVC Application		
Lab Contents		
A) List of Laboratory Assignments/Experiments (minimum -- to be covered)		
1	Simple programs using branching and looping, arrays, strings and methods, structures, classes, objects, inheritance, polymorphism and interfaces	
2	Programs to implement operator overloading, delegates, events, errors and exceptions	
3	Perform string manipulation with the string builder and string classes	
4	Program to implement windows forms	
5	Simple application using web controls a) Finding factorial Value b) Currency Conversion c) Quadratic Equation d) Temperature Conversion e) Login control	
6	Calendar control a) Display messages b) Display vacation c) Selected day using style d) Difference between two calendar dates	
7	Tree view control a) Tree view control and data list b) operations	

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



8	Program to implement validation controls
9	Validating form input controls using validation controls
10	Program to implement connectivity with database
11	Binding to databases using controls
12	Program to implement multiple forms, standard modules, and menus
13	Program to implement file manipulation
14	Working with XML, using Crystal Reports in web forms

B) MINI Project

Develop a website using ASP .Net with C# concepts learnt in the theory and exercises listed in part A with a good look and feel effects. You can use ASP .Net and .Net framework 4.0 and database.

Note: -

1. A team of two students must develop the web-based project. However, during the examination, Each student must demonstrate the project individually.
2. The team must submit a brief project report (20-25 pages) that must include the following:

a. Introduction	e. Screen Shots
b. System Requirement Specification	f. Conclusion & Future Enhancement
c. System Design	g. Bibliography
d. Implementation	
3. The Demonstration, Viva and Report Evaluation will be done for 50 Marks.

Instructions:

1. Mini project student group size is limited to two students only.
2. Project report duly signed by the Guide and HOD need to be submitted during examination.


Text Books:

T1. Herbert Schildt, "The Complete Reference: C# 4.0", Tata Mc Graw Hill, 2012.

Reference Books:

- R1.** J.NET 4.0 Programming (6-in-1), Black Book, Kogent Learning Solutions Inc., Wiley- Dream Tech Press, 2010.
- R2.** E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 3 edition 201
- R3.** Microsoft ASP.NET 4.0 Step by Step - George Shepherd, Microsoft Press
- R4.** Mastering ASP.Net - BPB Publication
- R5.** ASP.net – The Complete Reference- Tata McGraw Hill
- R6.** ASP.NET Programming –


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



S. Y. MCA

Academic Year – 2023-2024 Semester – III

[MCA222102B]: Mobile Application Development

Teaching Scheme: TH: -Hours/Week: 04 PR: -Hours/Week: 04	Credit TH: 04 PR: 02	Examination Scheme: In Sem. Evaluation: 20 Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW Evaluation : 25 Marks PR Evaluation : 50 Marks Total : 175 Marks
---	---	---

Course Objective:

1. To provide conceptual understanding of Mobile applications development
2. To acquire skills to develop Mobile applications.
3. To Designing and develop mobile applications using a chosen application development framework.
4. To evaluate alternative mobile frameworks, and contrast different programming platforms.

Course Outcome:

After successful completion of the course, students will able to:

CO1. Demonstrate their understanding of the fundamentals of Android operating systems

CO2. Demonstrate their skills of using Android software development tools

CO3. Understand database activities like retrieval and Sharing.

CO4. Discover the need for working with SQLite and its operations.

CO5. Illustrate the Peer to peer to communication using instant messaging and GTalk services .

CO6. Illustrate the android wifi features and Accessing Android Hardware

Course Contents

UNIT-I	Android application development Fundamentals	04 Hours
Overview of Android, Features of android, Architecture of Android, Libraries, Software development kit, Introducing views, List of views and view groups, Introducing layouts, Creating new views, creating and using Menus		
UNIT-II	Starting with Application Coding	09 Hours
Introducing Intents, Introducing Adapters, Using Internet Resources, Selecting Location Provider, finding your location, creating map-based activities.		
UNIT-III	Data Storage, retrieval and Sharing	09 Hours

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director





JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



File system in android, Internal and external storage, Saving and loading files, File Management tools		
UNIT-IV	Introduction to SQLite	09 Hours
Creating SQLite database, Editing Tasks with SQLite, Cursors and content values, Working with Android database		
UNIT-V	Peer to peer to communication	09 Hours
Accessing Telephony Hardware, Introducing Android Instant Messaging, GTalk Service : Using, binding & Making connection, Managing chat Sessions, Sending and receiving Data messages, Introducing SMS, Using, sending & receiving SMS Messages		
UNIT-VI	Accessing Android Hardware	05 Hours
Audio, Video and Using the camera, Introducing Sensor Manager, Android Telephony, Using Bluetooth, Manage network and Wi-Fi connections		
Text Books : T1. Professional Android™ Application Development Wrox Publications, Reto Meier T2. Hello Android, Introducing Google's Mobile Development Platform, Ed Burnette, Pragmatic Programmers, ISBN: 978-1-93435-617-3 T3. Sams teach yourself Android application development, Lauren Dercy and Shande Conder, Sams publishing		
Reference: R1. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd R2. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd R3. Android Application Development All in one for Dummies by Barry Burd, Edition: I		
Web Links https://developer.android.com http://www.tutorialspoint.com/android		
LAB Contents		
Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness. Students need to develop Mini Project on the basis of various concepts learned in the subject.		


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



S. Y. MCA

Academic Year – 2023-2024 Semester – III

[MCA222102C]: Artificial Intelligence & Machine Learning

Teaching Scheme: TH: - 04 Hours/Week LAB: -04 Hours/Week	Credit TH: 04 LAB: 02	Examination Scheme: In Sem. Evaluation : 20 Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW Evaluation : 25 Marks PR Evaluation : 50 Marks Total : 175 Marks
---	------------------------------------	--

Course Objective:

1. To Learn and understand the concepts of artificial intelligence and Machine Learning
2. Introduce and define the meaning of Intelligence and explore various paradigms for Search and knowledge encoding in computer systems is the basis of this course
3. To appreciate supervised learning and their applications.
4. To appreciate the concepts and algorithms of unsupervised learning

Course Outcome:

On completion of the course, student will be able to–

CO1: Understanding Python MODULES used in Machine Learning(ML).

CO2: Understanding basic Concept of Machine Learning .

CO3: Understanding Supervised and Unsupervised Learning concepts and techniques

CO4: Demonstrate fundamental understanding of Artificial Intelligence (AI) and its foundations.

CO5: Understanding the Concepts of Search Space Methods and Search Techniques.

CO6: Understanding Knowledge Representation Schemes.

Course Contents

UNIT-I	Machine Learning(ML) Python MODULES	6 Hours
NumPy- Creating Arrays, Array Indexing, Array Iterating, Joining Array, Array Split, Array Search , Array Sort. Pandas- Series, DataFrames , Read CSV, Analyzing DataFrames, Cleaning Data, Data Correlations. Matplotlib – Pyplot , Plotting, Subplot, Scatter, Bars, Histograms.		
UNIT-II	Introduction : Machine Learning(ML)	8 Hours
Machine Learning Process- Preliminaries for Machine, Learning algorithms -Turning data into Probabilities and Statistics for Machine Learning- Probability theory – Probability Distributions – Decision Theory.		
UNIT-III	Supervised & Unsupervised Learning	8 Hours

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Regression- Linear Regression, Multiple Linear Regression , Polynomial Regression, Classification- Logistic Regression, Support vector Machines , K-Means clustering, KNN (K-Nearest Neighbors), Apriori Algorithm.

UNIT-IV

Introduction to AI Fundamentals

6 Hours

Defining Artificial Intelligence, History of AI, AI task domains, Defining AI techniques, Turing Test, Intelligent Agents: Agents and Environments, Nature of Environments, Rationality, Performance Measures, Structure of Agents, Problem-Solving Agents.

UNIT-V

State space search and Heuristic Search Techniques

8 Hours

Defining problems as state space search, Problem Characteristics, Production Systems and characteristics, Breadth First Search , Depth First Search, Heuristic Search, Best First Search, A* Algorithm , Hill Climbing Algorithm.

UNIT-VI

Representing knowledge

6 Hours

Knowledge Representation Techniques: Computable functions and predicates, Backward Chaining, Procedural vs. Declarative Knowledge, Forward vs. Backward Reasoning, Semantic Networks, Partitioned Semantic Networks, Conceptual Dependency, Issues in Knowledge Representation.

Lab Contents

Guidelines for Assessment

Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

List of Laboratory Assignments/Experiments (minimum -- to be covered)

1	Write a NumPy to create above Series and then double the value in series and store in another series named Series2
2	Write a NumPy program to reverse an array (first element becomes last).
3	Number of students in class 11 and 12 in three streams('Science', 'Commerce' and 'Humanities') are stored in two series objects c11 and c12. Write NumPy code to find total number of students in class 11 and 12 , stream wise.
4	Write a NumPy program to sort an along the first, last axis of an array.
5	Write a NumPy program to create a new shape to an array without changing its data.
6	Write a NumPy program to count the number of "P" in a given array, element-wise.
7	Write a Pandas program to change the order of index of a given series.
8	Write a Pandas program to calculate the number of characters in each word in a given series.

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



9	Write a Pandas program to select the rows where number of attempts in the examination is less than 2 and score greater than 15.
10	Write a Pandas program to insert a given column at a specific column index in a DataFrame.
11	Write a Pandas program to count the missing values in a given DataFrame.
12	Predict Salary using Simple Linear Regression .
13	Predict Profit using Multiple Linear Regression.
14	Predict Salary using Polynomial Regression .
15	Predict Purchasing capability with % Accuracy of a person using Logistic Regression.
16	Predict Purchasing capability with % Accuracy of a using K-Nearest Neighbors (K-NN) Model.
17	Write a program to implement Best First Search traversal.
18	Write a program to implement using A* algorithm.
19	Use Heuristic Search Techniques to Implement Hill-Climbing Algorithms.

Text Books:

References:

- R1. Artificial Intelligence**, Elaine Rich, Kevin Knight, Shivashankar B. Nair, 3rd Edition, McGraw Hill
- R2. Artificial Intelligence-A modern Approach**, Stuart Russell and Peter Norvig, 3rd Edition, Pearson Education
- R3.** Tom Mitchell, “**Machine Learning**”, McGraw-Hill, 1997.
- R4.** Ethem Alpaydin, “**Introduction to Machine Learning**”, MIT Press, Third Edition, 2014
- R5.** Rogers, Simon, and Mark Girolami. **A first course in machine learning**. CRC Press, 2015.

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jyotsna Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



S. Y. MCA
Academic Year – 2022-2023 Semester-III
[MCA222102D] : Framework - Spring Boot

Teaching Scheme: TH: - Hours/Week : 04 PR: -Hours/Week : 04	Credit TH: 04 LAB: 02	Examination Scheme: In Sem. Evaluation : 20 Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW Evaluation : 25 Marks PR Evaluation : 50 Marks Total : 175 Marks
--	--	--

Course Objective:

1. Describe the application development and configuration using spring Boot Framework and spring.
2. Learn the use of starter web and starter JPA for database access using spring and Postman usage to call and test REST API services
3. Learn JPA to handles most of the complexity of JDBC-based database access and object-relational mappings
4. Learn how Spring Integration enables lightweight messaging within Spring-based applications and supports integration with external systems.
5. To Learn Web MVC Framework for building web applications using Spring MVC and H2 Databases.

Course Outcome:

After successful completion of the course, students will able to:

CO1. Learn to develop the spring Boot application and its configuration.

CO2. To Learn use of starter web and starter JPA for database access using spring.

CO3. Indicate the use Postman usage to call and test REST API services for database access.

CO4. Express proficiency in handling the most of the complexity of JDBC-based database access and object-relational mappings Using JPA Repository

CO5. Create a Spring-based applications and supports integration with external systems for lightweight Messaging.

CO6. Develop the web applications using Spring MVC and H2 Databases.

Course Contents

UNIT-I	Introduction to Spring Boot	7 Hours
Spring Boot - Goals and Important Features dependency injection. Developing Spring Applications before Spring Boot. Using Spring_INITIALIZER to create a Spring Boot Application. Creating a Simple REST Controller. What is Spring Boot Auto Configuration? Spring Boot vs		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Spring vs Spring MVC

UNIT-II	Spring Boot Starter Projects	6 Hours
Spring Boot Starter Projects - Starter Web and Starter JPA, Overview of different Spring Boot Starter Projects, Spring Boot Actuator, and Spring Boot Developer Tools.		
UNIT-III	REST API	7 Hours
Postman usage to call and test REST API , Rest Annotation with In Memory Database , CRUD Operations - Create, Read/Retrieve, Update and Delete		
UNIT-IV	JPA Repository Concepts	6 Hours
Crud Repository, JPA Query Concepts, Named Queries, Query Annotation, Async Results Pagination and Sorting		
UNIT-V	Integration with Spring Web	9 Hours
Using Spring Web MVC-UI , Using Spring Restful – get post delete put, Need of embedded servers and customization		
UNIT-VI	Spring MVC CRUD operations	10 Hours
CRUD operations-: Crud operations (create, read, update and delete.) with spring MVC forms and spring boot H2 databases.		

Lab Contents

Guidelines for Assessment

Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include- timely completion, performance, innovation, Efficient codes, punctuality and neatness. Evaluation of mini project based on presentation and work done.

List of Laboratory Assignments/Experiments (minimum -- to be covered)

1	Creating a simple Spring Boot web applications
2	Managing Spring Boot beans, properties, and application configuration
3	Creating and consuming REST services
4	Demonstrate the Postman usage to call and test REST API services
5	Implementation of JDBC-based database access and object-relational mappings Using JPA Repository
6	Creating Spring Boot web applications using spring web MVC
7	Perform the crud operations with spring MVC forms and spring boot H2 databases.
8	Mini Project using Spring Boot, Web MVC and H2 Databases

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Text Books:

- T1.** Spring Boot in Action – Craig Wells
T2. Spring Microservices in Action – John Carmell

Reference Books:

- R1.** Learning Spring Boot 2.0 – Stephani Maldini
R2. Spring 5 Recipes: A Problem – Solution Approach
R3. Reactive Spring - JoshLong
R4. Spring Security in Action – Laurentiu Spilca
R5. Expert Spring MVC and Web Flow – Seth Ladd

WebLinks-

- 1) <http://www.springboottutorial.com/spring-boot-auto-configuration>
- 2) <http://www.springboottutorial.com/spring-boot-vs-spring-mvc-vs-spring>
- 3) <http://www.springboottutorial.com/spring-boot-starter-projects>
- 4) <https://www.javatpoint.com/spring-vs-spring-boot-vs-spring-mvc>


Prof. Rinku Dulloo
Chairman BOS


Dr. Ram Joshi
Dean Academics


PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



S.Y.MCA
Academic Year –2023-2024 Semester-III
[MCA222102E]: Framework - React JS

Teaching Scheme: TH:-04Hours/Week LAB:-04Hours/Week	Credit TH:04 LAB:02	Examination Scheme: InSem.Evaluation : 20 Marks Mid Sem. Exam :30 Marks End Sem. Exam :50 Marks TW Evaluation : 25 Marks PR Evaluation : 50 Marks Total : 175 Marks
--	--	--

Course Objective:

1. Use a JavaScript package manager (either npm or Yarn)
2. The objective of this course is to help you learn the practical aspects of ReactJS and its ecosystem.
3. ReactJS will enable developers to develop large web applications which can change data, without reloading the page.

Course Outcome:

After successful completion of the course, students will able to:

CO1. Students will learn about MVC architecture, what is React and difference between single and multiple page applications? You will also learn how to install React, make use of NPM packages and ES6 concepts.

CO2. Students will learn React core concepts like Components, State and Props. You will also learn how to build the application layout using forms and style sheets.

CO3. Students will learn to build an application using different route techniques and consume remote data by integrating API in React applications.

CO4. Students will learn how to integrate Redux with React. Also, you will understand the other key terminologies associated with Redux to build a web application.

CO5. Students you will learn how to write and handle the Asynchronous actions using Redux

CO6. Students will learn how to implement Class component- Stateful features within Functional components using React Hooks.

Course Contents

UNIT-I	Introduction to Web Development and React	7Hours
Building Blocks of Web Application Development, Single-page and Multi-page Applications, Different Client-side Technologies, MVC Architecture, Introduction to React, Installation of React,		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



JSX and its use case, DOM, Virtual DOM and its working, ECMAScript, Difference between ES5 and ES6, NPM Modules.

UNIT-II	Components and Styling the Application Layout	8Hours
----------------	--	---------------

React Elements, Render Function, Components, Class Component, Component Constructor, Functional Components, Multiple Components, Props, Props with Class based Component, Props with Function based Component, States, Component Lifecycle, React Events, React Forms, Different Form Concepts, Styling in React, Inline Styling, CSS Stylesheet.

UNIT-III	Handling Navigation with Routes	8Hours
-----------------	--	---------------

Routing, react-router, Features of react-router, Configuration of routing using react-router, Navigation using Links, 404 page (Not found Page), URL Parameters, Nested Routes, Implementing styles using NavLink, Application Programming Interface, Build a REST API using json-server, API consumption in React application using Fetch method

UNIT-IV	React State Management using Redux	8Hours
----------------	---	---------------

Need of Redux, What is Redux?, Redux Architecture, Redux Action, Redux Reducers, Redux Store, Principles of Redux, Pros of Redux, NPM Packages required to work with Redux, More about react-redux package.

UNIT-V	Asynchronous Programming with Saga Middleware	8Hours
---------------	--	---------------

Saga Middleware. Topics: Need of Async operations, Async Workflow, Action Creators, How to write Action Creators?, Handling Async Actions via Reducers, Middleware, Redux-Saga, Generators in Redux-Saga, Saga Methods(), Major Sections of Redux-Saga, Debugging application using Redux Devtools.

UNIT-VI	React Hooks	5Hours
----------------	--------------------	---------------


Caveat of JavaScript classes., Functional components and React hooks, What are React hooks?, Basic hooks useState() hook, How to write useState() hook when state variable is an array of objects, useEffect() hook, Fetch API data using useEffect() hook, useContext() hook, Rules to write React hooks, Additional hooks, Custom hooks, Writing custom hooks

Lab Contents

Guidelines for Assessment

Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include-timely completion, performance, innovation, efficient codes, punctuality and neatness.


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director




JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



List of Laboratory Assignments /Experiments(minimum—to be covered)	
1	Build search filter in React
2	Write a program using NPM Modules
3	Write a program using React Elements
4	Write a program using Render Function
5	Write a program using Class Component
6	Write a program using Component Constructor
7	Simple counter exercise using react
8	Display a list in react
9	Build Accordion in React
10	Image slider using React JS
11	Create a checklist in React
12	Simple login form in React
13	Print data from REST API
14	Multi-Page navigation using React Router
15	Context API in React Components
16	Write a program using ReactDOM
17	Write a program using Functional Components
18	Write a program to implement styling in React
19	Write a program to implementing styles using NavLink
20	Write a program on API consumption in React application using Fetch method
21	Write a program to implement Action Creators
22	Write a program to implement Reducers
23	Write a program to implement Functional components and React hooks
24	Write a program to implement types of hooks


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Reference Books:

- R1.** The Road to React: Your journey to master React.js in JavaScript (2022 Edition) Kindle Edition by Robin Wieruch
- R2.** Learning React: Functional Web Development with React and Redux Paperback – 1 January 2017 by Alex Banks
- R3.** Fullstack React: The Complete Guide to ReactJS and Friends Paperback – 12 September 2017 by Anthony Accomazzo
- R4.** React in Action Paperback by Mark Tielens Thomas
- R5.** Fullstack React by Anthony Accomazzo, Fullstack.IO
- R6.** Advanced Web Development with React BY Mohan Mehul
- R7.** Beginning React (incl. Redux and React Hooks) by Greg Lim

Web Books:

- W1. <https://reactjs.org/>
- W2. <https://www.w3schools.com/REACT/DEFAULT.ASP>
- W3. [https://en.wikipedia.org/wiki/React_\(JavaScript_library\)](https://en.wikipedia.org/wiki/React_(JavaScript_library))
- W4. <https://www.javatpoint.com/reactjs-tutorial>
- W5. <https://www.simplilearn.com/tutorials/reactjs-tutorial/what-is-reactjs>

RSCOE

Prof. Rinku Dullo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarsi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



S. Y. MCA
Academic Year –2023-2024 Semester-III
[MCA222102F]: Framework - Django

Teaching Scheme: TH: - Hours/Week : 04 PR: -Hours/Week : 04	Credit TH: 04 LAB: 02	Examination Scheme: In Sem. Evaluation : 20 Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW Evaluation : 25 Marks PR Evaluation : 50 Marks Total : 175 Marks
--	--	--

Course Objective:

1. Describe the Web Framework, MVC pattern, Create a basic Django app and Create Views.
2. Define Database Models, use of model fields populate a database and perform the CRUD
3. Learn how to create Templates and Forms in Django with session and cookies and set the access rights using admin panel.
4. Explain the use Django's REST Framework and model serializers.
5. Learn to create functional website in django.

Course Outcome:

After successful completion of the course, students will able to:

- CO2.** Learn to create views and perform URL mapping
CO2. Design and Develop to create Database Models and add Dynamic content to your webpages.
CO3. Indicate the use of admin panel for handling the user privileges.
CO4. Express proficiency in designing dynamic web form using session management.
CO5. Able to create APIs and perform the database operations using APIs.
CO6. Develop the functional website using python and Django APIs.

Course Contents

UNIT-I	Introduction to Django and Hyperlinks project	7 Hours
INTRODUCTION TO DJANGO-: What Is a Web Framework? Introduction to Bootstrap, Features of Django, Django web server, Understanding Django environment, A simple 'Hello world' application DISPLAYING HYPERLINKS – PROJECT-: Django architecture, MVC and MTV, Starting a project, Django apps, Activating our first app, A view that displays a hyperlink, Mapping the views to URLs Running our first app.		
UNIT-II	Creating a website – project	10 Hours
Starting a project, Creating an app inside the project, Activating the app, Creating model for our site, Converting the model into a table, Examples for Fields in Models, Basic data access using Django shell, Saving objects into database, Retrieving objects from database, Modifying objects of database, Sorting objects, Filtering objects, Deleting objects, Making changes in the data model.		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



UNIT-III	Creating Administration Panel	6 Hours
Using the admin interface create admin panel, Adding users to admin panel, Data access and modification using admin panel, Giving permissions to users.		
UNIT-IV	Django Forms Creation and Sessions & cookies	6 Hours
FORMS CREATION-: Forms basics, Creating Contact Us form, Form field examples SESSIONS & COOKIES-: Difference between session and cookie, Creating sessions and cookies in Django.		
UNIT-V	Django Restful Api	6 Hours
CRUD operations-: DRF setup, RESTful structure, DRF quick start, model serializer, update views update URLs, Test, GET, POST, PUT, Delete		
UNIT-VI	Project Implementation	10 Hours
Creating a functional website in Django-: Steps- Creating URLs In ecom> urls.py Creating Models Register models into admin Creating views for displaying items Creating Url for products Creating template Make migrations and migrate Creating Superuser Project life cycle		
Lab Contents		
Guidelines for Assessment		
Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness. Evaluation of mini project based on presentation and work done		
List of Laboratory Assignments/Experiments (minimum -- to be covered)		
1	Writing your first Django app, part 1 1-1. Virtual Environment 1-2. Start Project 1-3. Start App	
2	Writing your first Django app, part 2	

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



	2-1. Admin 2-2. Model 2-3. Command
3	Writing your first Django app, part 3 3-1. Polls Index 3-2. Polls Detail 3-3. Django import / export
4	Writing your first Django app, part 4 4-1. Forms
5	Writing your first Django app, part 5 5-1. Test
6	Writing your first Django app, part 6 6-1. Template Extending
7	Mini Project using Python and Django
Text Books: T1. Django for beginners, Build websites with python & Django - William S. Vincent T2. Django Unleashed - Andrew Pinkham	
Reference Books: R1. Beginning Django E-commerce - Jim McGaw. R2. Django for API's - William S. Vincent R3. Django Design Patterens and Best Practices - Arun Ravindran R4. Test-Driven Development with Django - Kevin Harvey R5. Lightweight Django- Julia Elman and Mark Lavin R6. Two Scoops of Django 1.11 - Daniel Roy Greenfeld	
Web Links- 1) https://www.edureka.co/python-django 2) https://www.nobledesktop.com/classes/python-django-developmennt	

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandali's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



S. Y. MCA

Academic Year- 2023-2024 Semester- III [MCA222103]: Emerging Software Testing and Tools

Teaching Scheme: TH: -Hours/Week : 04 PR: Hours/Week : 02	Credit TH: 04 PR: 01	Examination Scheme: In Sem. Evaluation : 20 Marks Mid Sem. Exam : 30 Marks End Sem. Exam : 50 Marks TW Evaluation : 25 Marks PR Evaluation : 25 Marks Total : 150 marks
--	---	--

Course Objective:

Students should be able to understand

1. To learn the overview of software testing concepts and its techniques.
2. To expose to various testing tools.
3. To understand and manage the effective testing process.

Course Outcome:

On completion of the course, student will be able to–

- CO1: Design, implement and evaluate effective and efficient test cases to meet desired needs.
 CO2: Choose appropriate testing techniques and tools for real time testing applications.
 CO3: Write stubs and drivers code during unit, integration and system testing phase.
 CO4: Design Test cases to test object-oriented application, web based systems and to test mobile apps.
 CO5: Develop Test Plan document and produce Test Summary Reports in synchronization with the software development activities.
 CO6: Apply Software Testing process models and to improve the quality of the software from maintenance point of view

Course Contents

UNIT-I	Introduction to Software Testing	04 Hours
Basics of Software Testing –Evolution - Myths and Facts-Goals -Definitions-Model for Software Testing-Software Testing as a Process- Software Testing Terminology and Methodology- Software Testing Life Cycle(STLC)- types of testing- testing in the development life-cycle		
UNIT-II	Dynamic - Static and Regression Testing	10 Hours

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Black-Box Testing Techniques - Requirement based testing - Boundary Value Analysis (BVA) - Equivalence Class Testing - State Table-Based Testing - Cause-Effect Graphing Based Testing - Decision Table-Based Testing - Error Guessing. White-Box Testing Techniques: Need - Logic Coverage Criteria - Basis Path. Testing - Graph Matrices - Loop Testing - Data Flow Testing - Mutation Testing.

Testing principles-Verification and Validation – Test case design strategies. Inspections- Structured Walkthroughs- Technical Reviews- Validation Activities – Progressive vs. Regressive Testing - Regression Testing Produces Quality Software - Regression Testability - When is Regression Testing Done?- Types- Regression Testing Techniques.

UNIT-III

Levels of Testing

08 Hours

Need for Levels of Testing - unit testing – Test Harness - Integration testing - system testing – Types of system test: Functional, performance, stress and configuration testing - Regression testing - Acceptance testing

UNIT-IV

Testing for Specialized Environment

10 Hours

Object oriented testing - Testing Web based System – Challenges in testing for Web based software –Mobile app testing –Testing Mobile Apps – Mobile test Automation and tools – Mobile Test and Launch strategies

UNIT-V

Managing the Testing Process

04 Hours

Test Organization-Structure of Testing Group-Test Planning- Detailed Test Design and Test Specifications-Definition of Software Metrics-Classification -Entities to be Measured-Size Metrics-Testing Metrics for Monitoring and Controlling the Testing Process-Estimating Testing Efforts-Cyclomatic Complexity Measures for Testing-Function Point Metrics for Testing-Test Point Analysis (TPA)

UNIT-VI

Quality Management

04 Hours

Software Quality- Quality Costs- Benefits of Investment on Quality-Quality Control and Quality Assurance-Quality Management and Project Management-Quality Factors-Methods of Quality Management-SQA Models-Testing Process Maturity Models- Need for Test Process Maturity-Measurement and Improvement of Test Process- Test Process Maturity Models.

Lab Contents

Guidelines for Assessment

Prof. Rinku Dullo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Continuous assessment of laboratory work is done based on overall performance and Laboratory assignments performance of student. Each Laboratory assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each Laboratory assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

Software Testing (Automated) – Mandatory, Test automation – script creation and execution,
Tools: Selenium.

List of Laboratory Assignments/Experiments (minimum -- to be covered)

1	Introduction to Selenium, Installation and Setup
2	Selenium WebDriver Commands • Browser Commands • Navigation Commands • Web Element Commands • Find Element and Find Elements Command • Check Box & Radio Button Operations • Drop Down & Multiple Select Operations • Handle Dynamic Web Tables in Selenium Web driver
3	Navigate back/forwards, get, refresh • I_ loading a page in current window / New window • Move back and forward • Refresh Page
4	Interrogation: i. get window title ii. Current url iii. Page source
5	Locating web elements by Id, ClassName, LinkText, PartialLinkText, Name, TagName, CssSelector ,XPath
6	Inspecting elements in web browsers
7	Element interrogation
8	Manipulation: Click, submit, shift-click, special actions, type text, clear text, list box selection and manipulation commands
9	Synchronization: Page load time out, implicit wait, explicit wait, Expected Conditions class
10	Window handling: size, position, handles, switch to
11	Screenshot/capture

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



12	Browser profile: set preferred language, changing user agent, enable extension
13	Cookies: reading, creating and deleting
14	Data Driven Testing; Use pre-stored data as input and expected output (possible data Source file Excel)
15	Page Object Model: test scenario like shopping cart from login

Text Books :

T1. Software Engineering – A practitioner's approach by Roger S. Pressman, 5th Edition, McGraw Hill

Reference:

R1. Naresh Chauhan, Software Testing Principles and Practices, 2013, 6th impression, Oxford University Press.

R2. Srinivasan Desikan, Software Testing principles and practices, 2012, 4th Edition, Pearson

Publication R3. Ilene Burnstein, Practical Software Testing, 2013, 12th Edition, Springer Verlag International Edition, Springer, India.

R4. Software Engineering: A Precise Approach by Pankaj Jalote.

R5. Foundations of Software Testing by Aditya P. Mathur – Pearson Education custom edition 2000

R6. Testing Object Oriented Systems: models, patterns and tools, Robert V Binder, Addison Wesley, 1996

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jayawant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



S. Y. MCA
Academic Year- 2023-2024 Semester- III
[MCA222104]: Data Science

Teaching Scheme: TH: 03 Hours/Week	Credit 03	Examination Scheme: In Sem. Evaluation : 15 Marks Mid Sem. Exam : 20 Marks End Sem. Exam : 40 Marks Total : 100 Marks
---	----------------------------	---

Course Objective:

1. To Learn and understand the concepts of Data Science
2. To learn the concepts of Data collection Pre-processing methods
3. To understand the concepts of Basics of Statistics and Probability theories required for Data Analysis
4. To understand the concepts of Model Development in Data Analytics
5. To understand the concepts of Model Evaluation

Course Outcome:

On completion of the course, student will be able to–

CO1: Demonstrate fundamental understanding of Data Science.

CO2: Understand the basics statistical Methods for the Data analysis.

CO3: Understand the Data collection and preprocessing methods.

CO4: Understand the statistical terms and probability theory required for the Data analysis.

CO5: Understand the Analytical model development and the evaluation method of Data Analysis.

Course Contents

UNIT-I	Introduction	08 Hours
Introduction to Data Science – Evolution of Data Science – Data Science Roles – Stages in a Data Science Project – Applications of Data Science in various fields – Data Security Issues.		
UNIT-II	Data Collection and Data Pre-Processing	08 Hours

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Data Collection Strategies – Data Pre-Processing Overview – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization.

UNIT-III

Exploratory Data Analytics

08 Hours

Descriptive Statistics – Mean, Standard Deviation, Skewers and Kurtosis – Box Plots – Pivot Table – Heat Map – Correlation Statistics – ANOVA.

UNIT-IV

Model Development

08 Hours

Simple and Multiple Regression – Model Evaluation using Visualization – Residual Plot – Distribution Plot – Polynomial Regression and Pipelines – Measures for In-sample Evaluation – Prediction and Decision Making.

UNIT-V

Model Evaluation

08 Hours

Generalization Error – Out-of-Sample Evaluation Metrics – Cross Validation – Over fitting – Under Fitting and Model Selection – Prediction by using Ridge Regression – Testing Multiple Parameters by using Grid Search.

BOOKS:

Reference Books :

- R1. Jojo Moolayil, “Smarter Decisions: The Intersection of IoT and Data Science”, PACKT, 2016.R2.
- R2. Gupta, S.C. and Kapoor, V.K.: “Fundamentals of Mathematical Statistics”, Sultan & Chand & Sons, New Delhi, 11th Ed, 2002.
- R3. Cathy O’Neil and Rachel Schutt, “Doing Data Science”, O’Reilly, 2015.
- R4. David Dietrich, Barry Heller, Beibei Yang, “Data Science and Big data Analytics”, EMC 2013
- R5. Raj, Pethuru, “Handbook of Research on Cloud Infrastructures for Big Data Analytics”, IGI Global.

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



S. Y. MCA

Academic Year – 2023-2024 Semester III

[MCA222105]: Software Project Management

Teaching Scheme: TH: - 03 Hours /Week	Credit TH:03	Examination Scheme: In Sem. Evaluation : 15 Marks Mid Sem. Exam : 20 Marks End Sem. Exam : 40 Marks Total : 75 Marks
--	-------------------------------	---

Course Objective:

1. To learn process of software project management & cost estimation.
2. To apply the mathematical results and numerical techniques of optimization theory to concrete Technical problems.
3. To use of project management tools, user roles and software teams.

Course Outcome:

After successful completion of the course, students will able to:

CO1: Basic knowledge of Project Management

CO2: Implement project cost estimation

CO3: Apply PERT/CPM techniques to manage a project

CO4: Analyze project management techniques and propose a mathematical model for time minimization in project crashing

CO5: Identify Risk identification and management

CO6: Overall understanding of software team management

Course Contents

UNIT-I	Project Management Framework	05 Hours
Project Management Overview, Project Organization, Project Communication and Documentation, PMLC		
UNIT-II	S/w Project Estimation	09 Hours
Overview of Project Estimation, Method of Estimations (With Case Studies) COCOMO-I, COCOMO – II, DELPHI Cost Estimation, Function Point Analysis (Case Study)		

Prof. Rinku Dulloo
 Chairman BOS

Dr. Ram Joshi
 Dean Academics

PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director




JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



UNIT-III	Network Analysis including PERT and CPM - I	09 Hours
Basic differences between PERT and CPM, Arrow Networks, time estimates, Earliest expected time Latest – allowable occurrences time Forward Pass Computation Backward Pass Computation , Representation in Tabular Form , Critical Path , Probability of meeting scheduled date of completion, Calculation on CPM network.		
UNIT-IV	Network Analysis including PERT and CPM - II	08 Hours
Critical Path, Crashing the network , Resource leveling and recourse loading .		
UNIT-V	Risk Management	04 Hours
Risk Management, Identification of Risks, Risk Analysis, Risk Planning and Monitoring .		
UNIT-VI	Software Team Management	05 Hours
Group and Group Dynamics, Team Building, Leadership.		
Reference Books: R1. Software Project Management by Edwin Bennatan R2. Software engineering principles and practice, McGraw-Hill, Waman S. Javadekar R3. Effective software project management, Willy India edition, Robert K. Wysocki R4. Organizational behavior Fred Luthans R5. Software project management in practice, Pearson, Pankaj Jalote R6. J K Sharma, Operations Research Theory and Applications, MacMillan India Ltd.		


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



S. Y. - MCA
Academic Year – 2023-2024 Semester – III
[MCA222106]: Technical Seminar

Teaching Scheme: PR: -Hours/Week: 02	Credit PR: 01	Examination Scheme: TW : 25 Marks PR : 25 Marks Total : 50 Marks
---	--------------------------------	---

Course Objective:

1. Finding areas of interest in current IT domain.
2. Increasing awareness in technological development in chosen field.
3. Exploring the application areas on the topic selected.
4. Showcase of Presentation skills.

Course Outcome:

After successful completion of the course, students will able to:

- CO1.** Domain knowledge of the topic selected.
- CO2.** Get an idea about documentation.
- CO3.** Will get an presentation knowledge.

Course Contents

Students are expected to choose one of the topics in area of interest related to :

1. Current IT/technical domain.
2. Research.
3. Entrepreneurship development.
4. Management Area.

Student should prepare the report and PowerPoint presentation on the topic selected. And to be submitted to the concern faculty teacher at the end of the semester for evaluation.

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



S. Y. - MCA
Academic Year – 2023-2024 Semester - III
[MCAHS222101]: Human Values and Ethics

Teaching Scheme: PR: -Hours/Week : 02	Credit TH: 01	Examination Scheme: TW : 25 Marks PR : 25 Marks Total : 50 Marks
--	--------------------------------	---

Course Objective:

1. To help students distinguish between values and skills and understand the need, basic guidelines, content and process of value education.
2. To help students initiate a process of dialog within themselves to know what they 'really want to be' in their life and profession.
3. To help students understand the meaning of happiness and prosperity for a human being.
4. To facilitate the students to understand harmony at all the levels of human living, and live accordingly.


Course Outcome:

After successful completion of the course, students will able to:

- 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.

Course Contents


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jayawant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director




JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
 (An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



UNIT-I	Course Introduction - Need, Basic Guidelines, Content and Process for Value Education	05 Hours
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- the basic requirements for fulfillment of aspirations of every human being with their correct priority, Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario, Method to fulfill the above human Aspirations : understanding and living in harmony at various levels.		
UNIT-II	Understanding Harmony in the Human Being - Harmony in Myself	05 Hours
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; correct appraisal of Physical needs, meaning of Prosperity in detail, Programs to ensure Sanyam and Swasthya.		
UNIT-III	Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship	05 Hours
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, Difference between respect and differentiation; the other salient values in relationship, Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive Human Goals, Visualizing a universal harmonious order in society Undivided Society (AkhandSamaj), Universal Order (SarvabhaumVyavastha)- from family to world family!.		
UNIT-IV	Implications of the above Holistic Understanding of Harmony on Professional Ethics	05 Hours


Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Natural acceptance of human values, Definitiveness of Ethical Human Conduct, Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order, Competence in Professional Ethics:

a) Ability to utilize the professional competence for augmenting universal human order, b) Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems, technologies and management models, Case studies of typical holistic technologies, management models and production systems, Strategy for transition from the present state to Universal Human Order: a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers, b) At the level of society: as mutually enriching institutions and organizations.

Text Books:

T1. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.

Reference Books:

- R1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and Harper Collins, USA
- R2. E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.
- R3. Susan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
- R4. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth – Club of Rome's report, Universe Books.
- R5. A Nagraj, 1998, Jeevan Vidya Ek Parichay, Divya Path Sansthan, Amarkantak. R6. P L Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
- R7. A N Tripathy, 2003, Human Values, New Age International Publishers.
- R8. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen (Vaidik) Krishi Tantra Shodh, Amravati. R9. E G Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press
- R10. M Govindrajran, S Natrajan & V.S. Senthil Kumar, Engineering Ethics (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd.

Prof. Rinku Dullo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



R11.B P Banerjee, 2005, Foundations of Ethics and Management, Excel Books.

R12.B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow.
Reprinted 2008.

Mode of Evaluation: Assignment/ Seminar/Continuous Assessment Test/Semester End Exam

RSCOE

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033


Dr. Rakesh Jain
Director



S. Y. - MCA
Academic Year – 2023-2024 Semester - IV
[MCA222201]: Self Learning Course

Teaching Scheme: PR: -Hours/Week : 02	Credit PR: 02	Examination Scheme: TW : 50 Marks
Course Objective: 1. Certification of Students for knowledge and employability skills development.		
Course Outcome: After successful completion of the course, students will able to: CO1. Have a knowledge of different certification platforms/resources. CO2. Getting the Certification from the professional organization such as MOOC. CO3. NPTEL/SWAYAM/ Coursera, Udemy, Spoken Tutorials. CO4. Enhance the Employability.		
Course Contents		
MOOC: A massive open online course (MOOC) is an online course aimed at unlimited participation and open access via the web. In addition to traditional course materials, such as filmed lectures, readings, and problem sets, many MOOCs provide interactive courses with user forums or social media discussions. The MOOC contains the organization like NPTEL/SWAYAM, Spoken Tutorials, Coursera, Udemy etc. These organizations contain many online course.		
NPTEL/SWAYAM: It contains courses from different areas Such as Engineering, Management, Entrepreneurship etc. and soon. Under Computer engineering it contains courses like Scalable Data Science, Deep Learning, Cloud computing, Introduction to internet of things, Software Testing, Big Data Computing and So on.		
Spoken Tutorials: It also contains the courses like courses from different areas Such as Engineering, Management etc. Under Computer engineering it contains courses like PHP, Python, R, CAD etc. and soon.		

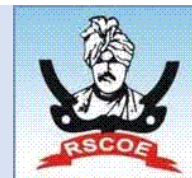

Prof. Rinku Dulloo
 Chairman BOS


Dr. Ram Joshi
 Dean Academics


 PRINCIPAL
 Jaywant Shikshan Prasarak Mandal's
 Rajarshi Shahu College of Engineering
 Tathawade, Pune-411 033
Dr. Rakesh Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Coursera: It contains courses from different areas Such as Engineering, Management, Entrepreneurship etc and soon. Under Computer engineering it contains courses like Java, C++, IOT, Linux, Block chain, Big Data etc.

Udemy: It contains courses from different areas Such as Engineering, Management, Entrepreneurship etc. and soon. Under Computer engineering it contains courses like Java, C++, IOT, Linux, Block chain, Big Data etc.

Lab Contents

Guidelines for Instructor's Manual

Students are expected to choose one subject for certification. Self-learning Courses to be done as per the own choice from the different reputed organizations such as MOOC/NPTEL/SWAYAM/Coudera/Udemy/Spoken Tutorials etc.


Guidelines for Assessment

Certificate to be submitted to the concern faculty.

References:

- R1. <https://www.udemy.com>
- R2. <https://www.coursera.org>
- R3. <https://swayam.gov.in>
- R4. <https://spoken-tutorial.org/accounts/login/>


Prof. Rinku Dulloo
Chairman BOS


Dr. Ram Joshi
Dean Academics


PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



S. Y. - MCA

Academic Year – 2023-2024 Semester – IV

[MCA222202]: Industrial Internship

Teaching Scheme:	Credit PR: 18	Examination Scheme:
		TW : 200 Marks
		PR : 250 Marks
		Total : 450 Marks

Course Objective:

1. Finding areas of interest in current IT domain.
2. Increasing awareness in technological development in chosen field.
3. Exploring the application areas
4. Showcase of Presentation skills

Course Outcome:

After successful completion of the course, students will able to:

- CO1.** Domain knowledge of the topic selected
- CO2.** Will get knowledge about system design and implementation
- CO3.** Will get the presentation knowledge
- CO4.** Get an idea about documentation through SRS

Course Contents

Students are expected to complete the project work on the area/ module assigned in the internship program at industry.

Project Evaluation

1. A students must develop the project in industry. However, during the examination, Each student must demonstrate the project individually
2. The student must submit a hard bound project report that must include the following :
 Introduction, System Requirement Specification, System Design, Implementation, Screen Shots, Conclusion & Future Enhancement, Bibliography
3. The Demonstration, Viva and Report Evaluation will be done for specified marks.

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jyotsna Shiksha Prasarak Mandal's
Rajarshi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



RSCOE

Prof. Rinku Dulloo
Chairman BOS

Dr. Ram Joshi
Dean Academics

PRINCIPAL
Jaywant Shikshan Prasarak Mandal's
Rajarsi Shahu College of Engineering
Tathawade, Pune-411 033
Dr. Rakesh Jain
Director