Savitribai Phule Pune University

(Formerly University of Pune)

Two Year Master's Degree Program in
Master of Vocational (M.Voc.)
(Software Development & Management)
(Faculty of Science and Management)

Syllabi for

M.Voc. (Software Development & Management) Part-I

(For Colleges Affiliated to Savitribai Phule Pune University)

Choice Based Credit System (CBCS)
Syllabus under National Education Policy
(NEP)

To be implemented from Academic Year 2023-2024

Savitribai Phule Pune University
Master of Vocational-(M.Voc.)
(Software Development and Management)

(To be implemented from Academic year 2023-2024 as per NEP)

Title of the Course: Master of Vocational (M.Voc.)
(Software Development & Management)

Preamble:

Master of Vocational (M.Voc.) Software Development & Management is a Vocational Master's Degree Programme designed for highly enthusiastic graduates with a good honors degree in any B.Voc or other degree having the same discipline.

This programme is targeted to those graduates who are interested in advancing their existing degree to gain expert knowledge of software development and management in the latest programming languages and management skill those who wish to enter the software industry and retail sector. It also aims to mold expert teaching professionals in the vocational software development and management discipline and thereby help them to pursue their research studies.

This vocational training program deals with software development and management and its allied areas especially in software development and management which is the emerging trend of current scenario. It is an advanced level software development and management training program.

The Software industry and retail sector is becoming increasingly complex, requiring higher caliber skills than ever before. However, the future prospects of the industry are not yet armed with those analytical, technical and digital skills required to propel the industry forward. Post-Graduation in Vocational degree is in a unique position to help bridge the skills gap for new joiners and help the industry up skill their existing workforce.

Sufficient industrial partnerships and the various levels of internships and also the live projects provided by the industries make the students work ready at each exit point

Eligibility:

Basic eligibility for Master of Vocational (M.Voc.) Software Development and Management is with minimum 50% overall CGPA or 50% marks in the following:

A candidate's Minimum educational qualification required to pursue this course is – completing a relevant Bachelor's Degree in Science, Computer Science, Computer Application, Commerce, Management, Level 7 NSQF certificate or Bachelor of Vocation (B.Voc.) course.

DURATION OF THE PROGRAMME:

1. The duration of Master of Vocational (M.Voc.) Software Development & Management Programme is two years with 4 semesters. To those students who have completed their programme without multiple entry and exit, the minimum period for completion of the programme is two years and the maximum period permissible for completing the programme is fixed as 4 years.

2. In the case of multiple entry and exit, students who successfully complete first two semesters can discontinue the programme, if they wish and can get a Post-graduate Diploma in Software Development & Management (at NSQF Level 8). Those who continue the course further and finish four semesters successfully will be eligible for Master of Vocational (M.Voc.) Software Development & Management Degree i.e. (at NSQF Level 9). Students who discontinue after second semester with P.G. Diploma in Software Development& Management can come back and opt for a lateral entry to third semester, later if they wish to do so, and can finish their Master of Vocational (M.Voc.) Degree in Software Development & Management within 4 years.

3. In multiple entry, the rejoining to the third semester shall be done by the students within three years from the date of their exit from the second semester. In such a case the maximum period for completion of the Master of Vocational (M.Voc.) Degree in Software Development & Management programme will be 4 years.

Programme Outcomes:

PO 1: The Programme seeks to instill in students a deep and comprehensive knowledge of core software development and management disciplines, advanced computer science concepts, theories, and principles, including algorithms, programming languages, artificial intelligence, machine learning, cloud computing, advanced databases, digital marketing, retail management, e-retailing, marketing management.

PO 2: Graduates should be equipped with the ability to analyze complex problems

in computer science, design innovative solutions, and implement them effectively.

PO 3: The program aims to develop students' research skills, enabling them to evaluate existing research, contribute to knowledge in the field, and apply critical thinking to solve computational problems.

PO 4: The program aims to cultivate a passion for research, encouraging students to engage in original research projects that contribute to the advancement of computer science knowledgeand address real-world problems.

PO 5: Students are expected to gain proficiency in multiple programming languages and develop the ability to write efficient, reliable, and maintainable code.

PO 6: Depending on the chosen track or concentration, students may develop expertise in areas.

PO 7: Through hands-on projects, practical assignments, and exposure to state-of-the-art tools and technologies, we aim to develop the technical proficiency and problem-solving skills necessary for success in the professional world.

PO 8: Graduates should be adept at presenting complex technical concepts clearly and effectively, both in written and oral forms, to various audiences.

PO9: Software Development and Management professionals often work in multidisciplinary teams. Students should learn to collaborate effectively with team members, understand different perspectives, and contribute productively to achieve common goals.

PO 10: The program places a strong emphasis on ethical considerations, responsible use of technology, and awareness of the societal impact of computing solutions. We aim to produce graduates who approach their work with integrity and a sense of social responsibility.

PO 11: Acknowledging the dynamic nature of software development and management, we aim to instill in our students a desire for continuous learning and professional development, empowering them to adapt and thrive in the face of technological advancements; prepared them to adapt to new technologies and methodologies throughout their careers.

PO 12: Students will be encouraged to think creatively and innovatively, exploring

new ideas and approaches to solve computational problems and advance the state of the art in the field.

PO 13: The program include On Job Training, internships, research work, research article andpapers writing or a thesis that provides students with practical experience, applying their knowledge to real-world challenges.

M.Voc(Software Development And Management) Structure as per NEP Guidelines

SEMESTER I

Course Type	Course code	Course Name	Credits		Teaching Scheme Hrs/Week		Examination Scheme and Marks		
			TH	PR	TH	PR	CE	EE	Total
Major Core	SDM-501-MJ	.Net Programming	4	-	4	-	30	70	100
	SDM-502-MJ	Fundamentals of Retailing and Retail Formats	4	-	4	-	30	70	100
	SDM-503-MJ	Advance Operating System	2	-	2	-	15	35	50
	SDM-504-MJP	Fundamentals of E- Retailing	-	2	-	4	15	35	50
	SDM-505-MJP	Lab course on .Net Programming	-	2	-	4	15	35	50
Major Elective	SDM-510-MJ	Advanced Mobile Technologies	2	-	2	-	15	35	50
	SDM-511-MJP	Lab Course on Advanced Mobile Technologies	-	2	-	4	15	35	50
	OR								
	SDM-512-MJ	Marketing Management	2	-	2	-	15	35	50
	SDM-513-MJP	Lab on Retail Business Skills	-	2	-	4	15	35	50
	OR								
	SDM-514-MJ	Database Technology	2	-	2	-	15	35	50
	SDM-515-MJP	Lab Course on Database Technology	-	2	-	4	15	35	50
RM	SDM-531-RM	Research Methodology (General/Subject Specific)	4	-	4	-	30	70	100
		Total	**16**	**6**					

SEMESTER II

Course Type	Course code	Course Name	Credits		Teaching Scheme Hrs/Week		Examination Scheme and Marks		
			TH	PR	TH	PR	CE	EE	Total
Major Core	SDM-551-MJ	Artificial Intelligence	4	-	4	-	30	70	100
	SDM-552-MJ	Retail Marketing Principles	4	-	4	-	30	70	100
	SDM-553-MJ	Machine Learning	2	-	2	-	15	35	50
	SDM-554-MJP	Lab on IT Solutions in Retail	-	2	-	4	15	35	50
	SDM-555-MJP	Lab course on Artificial Intelligence	-	2	-	4	15	35	50
Major Elective	SDM-560-MJ	JQuery	2	-	2	-	15	35	50
	SDM-561-MJP	Lab Course On JQuery	-	2	-	4	15	35	50
	OR								
	SDM-562-MJ	Digital Marketing	2	-	2	-	15	35	50
	SDM-563-MJP	Lab Course on Digital Marketing	-	2	-	4	15	35	50
	OR								
	SDM-564-MJ	Cloud Computing	2	-	2	-	15	35	50
	SDM-565-MJP	Lab course on Cloud Computing	-	2	-	4	15	35	50
On Job Training	SDM-581-OJT	On Job Training in IT industry/Summer Project (120 Hours)	-	4	-	-	30	70	100
		Total	**12**	**10**					

SEMESTER III

Course Type	Course code	Course Name	Credits		Teaching Scheme Hrs/Week		Examination Scheme and Marks		
			TH	PR	TH	PR	CE	EE	Total
Major Core	SDM-601-MJ	Design Analysis and Algorithms	4	-	4	-	30	70	100
	SDM-602-MJ	Operations & Supply Chain Management	4	-	4	-	30	70	100
	SDM-603-MJ	Data Analytics	2	-	2	-	15	35	50
	SDM-604-MJP	Case Studies in Retail Management	-	2	-	4	15	35	50
	SDM-605-MJP	Lab course on Design Analysis and Algorithms	-	2	-	4	15	35	50
Major Elective	SDM-610-MJ	Angular Js	2	-	2	-	15	35	50
	SDM-611-MJP	Lab Course on Angular Js	-	2	-	4	15	35	50
	OR								
	SDM-612-MJ	Financial Management	2	-	2	-	15	35	50
	SDM-612-MJP	Retail Banking Practical	-	2	-	4	15	35	50
	OR								
	SDM-614-MJ	Blockchain Technologies	2	-	2	-	15	35	50
	SDM-615-MJP	Lab Course on Blockchain Technologies	-	2	-	4	15	35	50
Research Project	SDM-631-RP	Research Project Work Research Paper in Conference	-	4	-	-	30	70	100
		Total	**12**	**10**					

SEMESTER IV

Course Type	Course code	Course Name	Credits		Teaching Scheme Hrs/Week		Examination Scheme and Marks		
			TH	PR	TH	PR	CE	EE	Total
Major Core	SDM-651-MJP	Full Time Industrial Training(SDM)	-	12	-	-	90	210	300
Major Elective	SDM-652-MJ	Online/MOOC Courses(Elective Course List)	4	-	-	-	30	70	100
Research Project	SDM-681-RP	Research Project Work (180 hrs.)	-	6	-	-	45	105	150
		Total	**4**	**18**					

Guidelines for Research Work (IT-631-RP):

- Students is expected to do the research work under the guidance of mentor assigned and to present by any one of the following:
  1. Presentation of the Research Paper in Conference.
  2. Publication in peer reviewed/UGC care Journal.
  3. Active participation and project Presentation in recognized research project competition.

Abbreviations

SDM	Software Development and Management		MJ	Major Theory
RM	Research Methodology		MJP	Major Practical
OJT	On Job Training		RP	Research Project
TH	Theory		PR	Practical
CE	Continuous Evaluation		EE	End semester Evaluation
MOOC	Massive Open Online Course			

Guidelines for Full Time Industrial Training (IT-651-MJP):

- Each student must complete the full time Industrial training in industry or institution during the semester for 360 hours.
- Students should submit a valid offer letter and synopsis within two weeks of starting the training
- College should assign a mentor to the group of 10 students.
- The mentor will monitor the progress of the students throughout the semester for continuous assessment.
- The students have to submit the monthly progress report time to time.
- There will be continuous assessment of the work done by the students during the period by the mentor assigned.
- The final presentation on the worked carried during the semester will be evaluated by the examination panel.

Guidelines for Research Work (IT-681-RP):

- Thesis/Dissertation/Project Report on Full Time Industrial Training
  - Students should prepare the thesis on the work carried during Industrial Training.
  - The documentation in the thesis will be evaluated by the examination panel.
- Research Paper(4 Credits)
  - Student should do the research work under the supervision of mentor assigned.
  - The research work is to be published in Peer reviewed or UGC care Journal.

Research Project

Research Project will consist of 2 parts:

I. The Research Proposal
II. The actual dissertation or Research Project Report

I. The Research Proposal

Students are required to submit their research ideas in the form of a research proposal to their supervisors / advisors / guides and get approval from the guide before the actual research work starts.

Format of Research Proposal (RP)

- Project Title
- Introduction and Origin of the research problem
- Interdisciplinary relevance
- Review of Research and Development in the Subject
- National / International status
- Significance of the study - Objective, methodology
- Approximate time by which each stage will be completed
- Expected results and the outcome of the research project
- Bibliography

Following can be used as a guide to evaluate a RP

- ***Does the proposal address a well-formulated problem*?** Have research gaps been identified.
- ***Is it a research problem***, or is it just a routine application of known techniques?
- ***Do the proposers have a good idea on which to base their work?*** The proposal must explain the idea in sufficient detail to convince the reader that the idea has some substance, and should explain why there is reason to believe that it is indeed a good idea.
- ***Does the proposal explain clearly what work will be done?*** Does it explain what results are expected and how they will be evaluated? How would it be possible to judge whether the work was successful?
- ***Is there evidence that the proposers know about the work that others have done on the problem?*** This evidence may take the form of Literature Review or a short review as well as representative references.

The proposal should answer three key questions:

1. What are we going to learn as the result of the proposed project that we do not know now?
2. Why is it worth knowing?
3. How will we know that the conclusions are valid?

II. The Research Project

Students should submit a proper research dissertation at the end of their research work for the required credits.

Format of Research Project:

- Title of Research
- Certificate
- Index
- List of Figures
- List of Tables
- Publications
- Introduction - Objectives of the Research
- Literature Review of previous research in the area and justification / Importance /Value of further research, Data, Scope and Limitations
- Actual Work Done with Experimental Setup, if any.
- Results and Discussion
- Future scope of research
- Bibliography in format –Author name, title, publication details , year

Semester-I

Savitribai Phule Pune University
M.Voc(Software Development and Management)
Sem - I

Course code: SDM-501-MJ
Course Title: .Net Programming

No. of Credits: 04 **Total Hours: 60**

Course Outcome: At the end of the course students will be able to,
CO1. Explain the architecture of Dot Net Technology.
CO2. Develop single form based simple .Net applications using basic and advanced control.
CO3. Develop multiple form using files and menu based on .Net applications.
CO4. Develop small ADO.net based database driven .Net application.

Chapter No.	Course Contents	No. of Hours	CO Targeted
1	**Introduction to .Net** • NET Framework features & architecture. • CLR, Common Type System, MSIL, Assemblies and class libraries .Introduction to visual studio. • Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, and Object Browser. • The environment: Editor tab, format tab, general tab, docking tab. visual development & event driven Programming -Methods and events.	15	CO1
2	**The .Net Language** • VB.NET Language- Variables -Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Structure Programming. • Modularity • Information Hiding • Abstraction • Events • subroutines and functions • Message box	15	CO2

	• Input box. Control flow statements: conditional statement, loop statement		
3	**Working with WPF** • Introduction: Understanding Windows Graphics - WPF: A Higher- Level API - The Architecture of WPF. • XAML: Basics, Properties and Events in XAML – Loading and compiling -Layout-.Classic Controls: • The Control Class - Content Controls - Text Controls - List Controls - Range-Based Controls.	**10**	**CO3**
4	**Objects and Collections** • Understanding objects, Properties, Methods. • Understanding collections. Files • Introduction – Classification of files – Processing files – handling files and folder using class – Directory class – file class.	**10**	**CO3**
5	**Database programming with ADO.NET:** • Overview of ADO, from ADO to ADO.NET, • Accessing Data using Server Explorer. • Creating Connection, • Command, • Data Adapter and Data Set with OLEDB and SQLDB. • Display Data on data bound controls. • Display data on data grid. • Generate reports using crystal report viewer.	**10**	**CO4**

References Books:

1.Michael Halvorson, 2010, Visual Basic 2010 Step by Step, First Editon, Microsoft Press.
2. Shirish Chavan, 2007, Visual Basic .Net, 1st Edition, Pearson Education, New Delhi.
3. Bryan Newsome, 2012, Beginning Visual Basic 2012, John Wiley & Sons, Inc.
4. Matthew MacDonald, 2008, Windows Presentation Foundation with .NET 3.5, Apress

Savitribai Phule Pune University
M.Voc- (Software Development and Management)
Semester - I

Course code: SDM-502-MJ
Course Title: FUNDAMENTALS OF RETAILING AND RETAIL FORMATS

No. of Credits: 04 **Total Hours: 60**

Course Outcomes: On completion of the course, student will be able to understand,
CO1: Understand the ways that retailers use marketing tools and techniques to Interact with their customers.
CO2: Apply a broad theoretical and technical knowledge of retail management to understand Opportunities and challenges for creating excellent retailing experience
CO3: Provide in-depth specialist and professional advice related to market selection and location analysis.
CO4: Critically analyze and summarize market information to assess the retailing environment and formulate effective retail strategies.

Chapter No.	Course Contents	No. of Hours	CO Targeted
Unit-1	**Definition and Scope of Retailing** **Retailer** ● Evolution of Retailing Industry – ● Retailer's Role in the Distribution Channel ● Vertical Marketing System ● Career opportunities in Retail ● Store Location ● Retail Communication Mix ● Merchandise Buying System.	**10**	**CO1**
Unit-2	**Functions of Retailers** ● Benefits of Retailing ● Benefits to Customers ● Benefits to Manufactures and ● Wholesalers ● Trends in Retailing ● Global Retail Scenario ● Indian Retail Scenario ● Prospects of Retailing in India ● Retail Management Information Systems.	**10**	**CO2**
Unit-3	**Retail Formats I: Classification of retailer** ● Store based Retailers; By Ownership ● Independent store ● Chain store ● Franchise store; By price ● Discount store, Factory outlet stores	**20**	**CO3**

	● warehouse club ● Catalog Showrooms; By Product Line ● Department store, supermarket ● Hypermarket.		
Unit-4	**Retail Formats II: Specialty Retailers** ● Convenience stores ● Non-store-based Retailer. ● Direct selling, Direct marketing ● catalog marketing ● telemarketing ● TV home shopping ● World Wide Web, ● Automatic vending.	**20**	**CO4**

References Books:

1. Bermanand Evans, Retail Management, Prentice Hall
2. Swapana Pradhan, Retailing Management, Tata McGraw Hill Publishing Company
3. Harjit Singh, Retail Management, S. Chand &Co., New Delhi.
4. S.C Bhatia, Retail Management, Atlantic publishers

Savitribai Phule Pune University
M.Voc.(Software Development and Management)
Sem- I

Course code: SDM-503-MJ
Course Title: Advance Operating System
No. of Credits: 02 **Total Hours: 30**

Course Outcome:
At the end of the course students will be able to:
CO1:Classify management of deadlocks and File System by operating system.
CO2: Evaluate Scheduling storage or disk for processes.
CO3: Choose different Distributed Operating System and its architecture.
CO4: Solve the problem on distributed and mobile Operating system.

Chapter No.	Course Contents	No. of Hours	CO Targeted
1	**Overviewof UNIX Operating System:** • Architecture of UNIX/LINUX Operating System • Introduction to Kernal • Introduction to shell programming and Unix commands	6	CO1
2	**File Subsystem:** • Nodes, structure of regular file • Conversion of a path name to an Inode, Super block • Inode assignment to a new file • Allocation of disk blocks. System calls for File system: Algorithms for : Open – Read – Write – Adjusting the position of file I/O lseek –Close, File creation – Changing directory, root, owner, mode, stat and fstat, Pipes – Dup, Mounting and unmounting file systems - Link – unlink	8	CO2
3	**Processes :** • Process states and transitions, the context of a process • Savingthe context of a process • Manipulation of the process address space - Sleep.	6	CO3
4	**Process Control:** • Process creation, Signals • Process termination, awaiting process termination • Invoking other programs – user id of a process – Changing the size of a process, Shell – System boot and the INIT process– Process Scheduling and time.	6	CO2

5	**Memory Management:** • Memory Management Policies: Swapping • Demand paging, Driver Interface • Disk Drivers – Terminal Drivers, Streams • Inter process communication.	**4**	**CO4**

References Books:

1. Maurice J. Bach, “The Design of the Unix Operating System”,ISBN : 9780132017992, Prentice Hall.

2.B. Goodheart, J. Cox, “The Magic Garden Explained”,1994, ISBN: 9780130981387, Prentice Hall of India.

3. S. J. Leffler, M.K. Mckusick, M. J. .Karels and J. S. Quarterman.,“The Design andImplementation of the 4.3 BSD Unix Operating System”,1st Edition, 1996, ISBN: 9780132317924, Addison-Wesley Professional.

4. J. Hart, “Windows System Programming”, 4th Edition, 2008, ISBN: 9780321658272,PearsonEducation.

5. A. Robbins, “Linux Programming by Example: The Fundamentals”,2nd Edition,2008, ISBN: 9788131704196, Pearson Education.

Savitribai Phule Pune University
M.Voc.- (Software Development and Management)
Sem - I

Course code: SDM-504-MJP
Course Title: Lab course on FUNDAMENTALS OF E-RETAILING
No. of Credits: 02 **Total Hours: 30**

Course Outcome:
On completion of the course, student will be able to understand,
CO1: Use tools and services of the internet in the development of a virtual e-commerce site.
CO2: Demonstrate an understanding of the importance of brand management online.
CO3: Assess online pricing options and implications.
CO4: Explain the role of digital media in identifying, anticipating and satisfying consumer needs and wants.

Note:
35 marks will be for practical to be conducted by Internal Examiner. Students are required to prepare

Practical Assessment.

1. Internet Marketing Techniques
2. Online Pricing and Promotions
3. Website Development
4. Virtual Store E-Retailing
5. Online Retailing
6. E-Marketing
7. Applications of E-Business

Savitribai Phule Pune University
M.Voc.(Software Development and Management)
Sem - I

Course code: SDM-505-MJP
Course Title: Lab course on .Net Programming
No. of Credits: 02 **Total Hours: 30**

Course Outcome:
CO1 Create user interactive web pages using ASP.Net.
CO2 Develop simple data binding applications using ADO.Net connectivity.
CO3 Performing Database operations for Windows Form and web applications.
CO4 Design web application to perform basic operations (insert, delete, select and Update) using ADO.Net.

List of Assignments:
1: Program to display the addition, subtraction, multiplication and division of two number using console application.
2: Program to display the first 10 natural numbers and their sum using console application.
3: Program to display the addition using the windows application.
4: Write a program to convert input string from lower to upper and upper to lower case.
5: Write a program to simple calculator using windows application.
6: Write a program working with Page using ASP.Net.
7: Write a program working with forms using ASP.NET.
8: Write a program to connectivity with Oracle database.
9: Write a program to access data source through ADO.NET.
10: Write a program to manage the session.

Web references:
1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javatpoint.com
4. www.geeksforgeeks.com
5. www.programiz.com
6. www.theserverside.com
7. www.educba.com
8. www.sanfoundry.com
9. www.prepbytes.com
10. www.codercampus.com

Savitribai Phule Pune University
M.Voc.(SoftwareDevelopment and Management)
Sem- I

Course code: SDM-510-MJ
Course Title: Advanced Mobile Technologies

No. of Credits: 02 **Total Hours: 30**

Course Outcome: On completion of the course, student will be able to understand,

CO1: Gain knowledge about different mobile platform and application development.

CO2 : To know the programming using Android and Windows platform

CO3: To gain knowledge of installing Android Studio and Cross Platform Integrated Development Environment.

CO4: An ability to use the techniques, skills, and modern technology.

CO5: Understanding of the specific requirements, possibilities and challenges when developing for a mobile context.

Chapter No.	Course Contents	No. of Hours	CO Targeted
1	**Introduction to Android** 1.1 What is Android? 1.2 Android Architecture 1.3 Basic Building blocks - Activities, Services, Broadcast Receivers & Content providers 1.4 Android API levels (versions & version names) 1.5 Setting up development environment 1.6 AndroidManifest.xml 1.7 Emulator-Android Virtual Device 1.8 Resources & R.java, Assets 1.9 Activities and Activity lifecycle 1.10 First sample Application	04	CO3,CO4
2	**Basic UI design** 2.1 Basic UI Designing (Form widgets ,Text Fields , Layouts ,[dip, dp, sip, sp] versus px) 2.2 All components (e.g Button , Slider,Image view, Toast) Event Handling 2.3 Components for communication -Intents & Intent Filters 2.4 Adapter	08	CO2,CO3, CO4

	2.5 Menu 2.6 Time and Date picker 2.7 Images and media 2.8 Toast 2.9 Dialog Box		
4	**Content Providers** 4.1 SQLite Programming 4.2 SQLite OpenHelper 4.3 SQLite Database 4.4 Cursor 4.5 Reading and updating Contacts 4.6 JSON Parsing 4.7 Accessing Phone Service(Call, SMS, MMS) 4.8 Location based services	**05**	**CO2,CO3, CO4**
5	**Introduction to React Native** 5.1 What is React Native? 5.2 What does it do for us? Why choose it? 5.3 Pros and cons 5.4 Architecture 5.5 Sharing with web projects 5.6 What React Native code looks like 5.7 Creating React Environment	**04**	**CO1,CO5**
6	**UI for React Native App** 6.1 Adding Styles to the Elements 6.2 Toggle Buttons 6.3 List Items 6.4 Flexbox to create a Layout 6.5 Navigation setup 6.6 Developing Reusable button 6.7 Including Custom Fonts and Icons 6.8 Orientation Change Detection 6.9 Webview to embed external websites 6.10 Creating a Form Component	**05**	**CO1,CO5**
7	**The Development Process** 7.1 React-Native vs. Create-React-Native app 7.2 The React Native team's recommendations 7.3 What is expo? 7.4 Creating a new React Native app 7.5 How to run it on a wireless device 7.6 How to run it in an Android emulator	**04**	**CO5**

Savitribai Phule Pune University
M.Voc(Software Development and Management)
Sem- I
Course code: SDM-511-MJP
Course Title: Lab Course on Advanced Mobile Technologies

No. of Credits: 02 **Total Hours: 30**

Course Outcome: On completion of the course, student will be able to understand,

1. To gain knowledge of installing mobile platform, application development, Android Studio and Cross Platform Integrated Development Environment.
2. Understanding of the specific requirements, possibilities and challenges when developing for a mobile context.

Lab Assignments:

1. Create a Simple Application which shows the Life Cycle of Activity.
2. Create a Simple Application Which Send ―Hello! Message from one activity to another with help of Button (Use Intent).
3. Create an Android Application to accept two numbers and find power and Average. Display the result on the next activity on Button click.
4. Create an Android App with Login Screen. On successful login, gives message go to next Activity (Without Using Database& use Table Layout).
5. Create an Android Application that Demonstrate Alert Dialog Box.
6. Create an Android Application to demonstrate the Simple calculator.
7. Create an application to demonstrate date and time picker.
8. Demonstrate Array Adapter using List View to display list of Country.
9. Create an Android application to demonstrate Progress Dialog Box using AsyncTask.
10. Construct an Android Application to accept a number and calculate Factorial and Sum of Digits of a given number using Context Menu.
11. Create a Android Application to demonstrate Vertical Scroll Bar.
12. Create an Android application that plays an audio(song) in the background. Audio will not be stopped even if you switch to another activity. To stop the audio, you need to stop the service.
13. Create an Android application to send email.
14. Create an android Application for performing the following operation on the table Customer (id, name, address, phno). (use SQLite database) i) Insert New Customer Details.ii) Show All the Customer Details on Toast Message.
15. Create an Android Application to perform Zoom In, Zoom Out operation and display Satellite view, on Google Map.
16. Create an Android Application that produces Notification.
17. Create a React Native mobile application to Implementing Google Map into the App.
18. Create a React Native mobile application to Implementing Audio Player and Image Carousel.
19. Create a React Native mobile application to Implementing Push Notification to the App.
20. Create a React Native mobile application to Implementing Browser Based Authentication.

Savitribai Phule Pune University
M.Voc.- (Software Development and Management)
Semester- I

Course code: SDM-512-MJ
Course Title: Marketing Management

No. of Credits: 02 **Total Hours: 30**

Course Outcome: On completion of the course, student will be able to understand,

1. DESCRIBE the key terms associated with the 4 Ps of marketing.
2. COMPARE and CONTRAST various approaches to pricing for a real world marketing offering (commodities, goods, services, e-products/ e-services.)
3. DEMONSTRATE an understanding of various channel options for a real world marketing offering (commodities, goods, services, e-products/ e-services.)
4. XAMINE the product line of a real world marketing offering (commodities, goods, services, e-products/ e-services.)
5.

Chapter No.	Course Contents	No. of Hours	CO Targeted
Unit-1	**Product:** • Meaning, The Role of Product as a market offering, • Goods & Services Continuum, Classification of consumer products- convenience, shopping, shopping, unsought goods. • Classification of industrial products- materials and parts, capital items, supplies and services. The Product Hierarchy, • Product Systems and Mixes, Product Line • Analysis, • Product Line Length, The Customer Value Hierarchy. New Product Development - Need, Booz Allen & Hamilton • Classification Scheme for New Products, New Product Development Process - Idea Generation to commercialization. • Branding: Concept, Definition, Commodity Vs. Brand, Product Vs Brand, Concept of Brand equity.	**6**	**CO1**
Unit-2	**Pricing:** • Meaning, The Role of Pricing, Importance and Factors influencing pricing decisions. • Setting the Price: Setting pricing objectives, Determining demand, Estimating costs, Analyzing competitors' pricing, Selecting pricing method,	**9**	**CO2**

	• Selecting final price. Adapting the Price: Geographical pricing, Price discounts & allowances, • Promotional • pricing, Differentiated pricing, concept of transfer pricing, Dynamic pricing (surge pricing, auction pricing), Pricing in online marketing (free, premium, freemium). • Price Change: Initiating & responding to price changes		
Unit-3	**Place:** • Meaning, The Role of Marketing Channels, Channel functions & flows, Channel Levels, • Channel Design Decisions - Analyzing customers' desired service output levels • Establishing objectives & constraints, Identifying & evaluating major channel alternatives. • Channel Options - Introduction to Wholesaling, Retailing, Franchising, Direct marketing, Introduction to Omni channel & hybrid channel options. • Market Logistics Decisions - Order processing, • Warehousing, Inventory, and Logistics	**6**	**CO3**
Unit-4	**Promotion**: • Meaning, The role of marketing communications in marketing effort. Communication Mix Elements • Introduction to Advertising, Sales Promotion, Personal Selling, Public Relations, Direct Marketing. Concept of • Integrated Marketing Communications (IMC), • Developing Effective Communication - Communication Process, Steps in Developing effective marketing communication - identifying target audience, determining communication objectives, • Designing a message, Choosing media, Selecting message source, Collecting feedback. Shaping the overall promotion • mix: promotional mix strategy, push-pull strategies	**9**	**CO4**

References Books:

1. Principles of Marketing, Philip Kotler, Gary Armstrong, Prafulla Agnihotri, Ehasan Haque, Pearson
2. Marketing Management- Text and Cases, Tapan K Panda, Excel Books
3. Marketing Management, Ramaswamy & Namakumari, Macmillan.
4. Marketing Whitebook

Savitribai Phule Pune University
M.Voc.- (Software Development and Management)
Semester- I

Course code: SDM-513-MJP
Course Title: Lab on Retail Business Skills

No. of Credits: 02 **Total Hours: 30**

Course Outcome: On completion of the course, student will be able to understand,

CO1: Understand the different business skills situation (self- service, self- selection and full personal service)

CO2: Use active listening skills to identify specific customer needs identify various means of opening a sale

CO3: Demonstrate thorough product knowledge while retailing i.e. benefits in use, functions, materials, origins, features

CO4: Explain functions/features/benefits of a product appropriate to the needs of a particular consumer (through information gained by active listening)

Chapter No.	Course Contents	No. of Hours	CO Targeted
Unit-1	**Section A-Selling Skills** • Explain Pre-Store Opening, Store Opening and Closing • Understanding Loss Prevention &Shrinkage • Understanding Store Merchandise Handling • Explain Basics of Visual Merchandising • Identifying Opportunities for Up-selling and Cross-selling • Collecting and Interpreting Customer Responses and Acknowledging Customer Buying Decision • Explaining Product Features and Benefits to Customers to Promote Sales and Goodwill • Helping Customers Choose Products and Handling Customer Queries • Effective After Sales Service &Customer feedback management • 10. Understanding Hazards	**15**	**CO1,CO3**
Unit-2	**Section B- Professional Skills** • Decision Making, Interpersonal Skills • Personality Development including Job Readiness • Personal Hygiene & Grooming, Job Interview readiness	**15**	**CO2,CO4**

	• Planning & Organizing (in capacity of the Role)- Problem Solving • Analytical Skills & Negotiation Skills • Effective Communication and Teamwork • Personal Effectiveness / Personality Development • Allocate and check work in your team- Work Effectively in a Retail Team • Identification of New Clients- Targeting Potential Clients and Keeping Records • 10. Customer Loyalty and Customer Service		

Savitribai Phule Pune University
M.Voc.(Software Development and Management)
Sem – I

Course Code: SDM-514-MJ
Course Name: Database Technology

No. of Credits: 02 **Total Hours: 30**

Course Outcome: On completion of the course, student will be able to understand,

1. Provide an overview of the concept of NoSQL technology.
2. Provide a glimpse of the various types of NoSQL databases with its features, suitable use case.
3. Aware students with implementation of NoSQL databases.
4. Provide the knowledge of different operations thatperformed on NoSQL databases.

Chapter No	Course Contents	No. of Lectures	CO Targeted
1	**Introduction to NOSQL (Core concepts)** 1.Why NoSQL 1.1 The Value of Relational Databases 1.1.1 Getting at Persistent Data 1.1.2 Concurrency 1.1.3 Integration 1.1.4 A (Mostly) Standard Model 1.2 Impedance Mismatch 1.3 Application and Integration Databases 1.4 Attack of the Clusters 1.5 The Emergence of NoSQL 2.Aggregate Data Models 2.1 Aggregates 2.1.1 Example of Relations and Aggregates 2.1.2 Consequences of Aggregate Orientation 2.2 Key-Value and Document Data Models 2.3 Column-Family Stores 2.4 Summarizing Aggregate-Oriented Databases 3 Data modeling details 3.1 Relationships 3.2 Graph Databases 3.3 Schemaless Databases 3.4 Materialized Views 3.5 Modeling for Data Access 4. Distribution Models 4.1 Single Server 4.2 Sharding 4.3 Master-Slave Replication 4.4 Peer-to-Peer Replication 4.5 Combining Sharding and Replication	**10**	**CO1**

	5. Consistency 5.1 Update Consistency 5.2 Read Consistency 5.3 Relaxing Consistency 5.3.1 The CAP Theorem 5.4 Relaxing Durability 5.5 Quorums 6. Version stamps 6.1 Business and System Transactions 6.2 Version Stamps on Multiple Nodes 7. Map-Reduce 7.1 Basic Map-Reduce 7.2 Partitioning and Combining 7.3 Composing Map-Reduce Calculations 7.3.1 A Two Stage Map-Reduce Example 7.3.2 Incremental Map-Reduce		
2	**Implementation with NOSQL databases** Key-Value Databases (Riak) 1 What Is a Key-Value Store 2 Key-Value Store Features 2.1 Consistency 2.2 Transactions 2.3 Query Features 2.4 Structure of Data 2.5 Scaling 3 Suitable Use Cases 3.1 Storing Session Information 3.2 User Profiles, Preferences 3.3 Shopping Cart Data 4 When Not to Use 4.1 Relationships among Data 4.2 Multioperation Transactions 4.3 Query by Data 4.4 Operations by Sets	**04**	**CO2, CO3**
3	**Document Databases (Mongodb)** 1 What Is a Document Database? 2 Features 2.1 Consistency 2.2 Transactions 2.3 Availability 2.4 Query Features 2.5 Scaling 3 Suitable Use Cases 3.1 Event Logging 3.2 Content Management Systems, Blogging Platforms 3.3 Web Analytics or Real-Time Analytics 3.4 E-Commerce Applications 4 When Not to Use 4.1 Complex Transactions Spanning Different Operations 4.2 Queries against Varying Aggregate Structure	**04**	**CO2, CO3**

4	**Column-Family stores (Cassandra)** 1 What Is a Column-Family Data Store? 2 Features 2.1 Consistency 2.2 Transactions 2.3 Availability 2.4 Query Features 2.5 Scaling 3 Suitable Use Cases 3.1 Event Logging 3.2 Content Management Systems, Blogging Platforms 3.3 Counters 3.4 Expiring Usage 4 When Not to Use	**04**	**CO2, CO3**
5	**Graph Databases** 1 What Is a Graph Database? 2 Features 2.1 Consistency 12.2 Transactions 2.3 Availability 2.4 Query Features 2.5 Scaling 3 Suitable Use Cases 3.1 Connected Data 3.2 Routing, Dispatch, and Location-Based Services 3.3 Recommendation Engines 4 When Not to Use	**04**	**CO2, CO3**
6	**Performing CRUD Operations** 1. Introduction of CRUD operations 2. Creating Records 2.1 Creating Records in a Document-Centric Database 2.2 Using the Create Operation in Column-Oriented Databases 2.3 Using the Create Operation in Key/Value Maps 3. Accessing Data 3.1 Accessing Documents from MongoDB 3.2 Accessing Data from HBase 3.3 Querying Redis 4. Updating and Deleting Data 4.1 Updating and Modifying Data in MongoDB, HBase and Redis 4.2 Limited Atomicity and Transaction Integrity	**04**	**CO4**

Reference Books:

1. NoSQL Distilled by Pramod Sadalge, Martin Fowler, Pearson Education, Inc.
2. NoSQL for Dummies by Adam Fowler, A Wiley Brand
3. Professional NoSQL by Shashank Tiwari, Wrox Publication

Savitribai Phule Pune University
M.Voc.(Software Development and Management)
Sem – I

Course Code: SDM-515-MJP
Course Name: Lab Course on Database Technology
No. of Credits: 02 **Total Hours: 30**

Course Outcome: On completion of the course, student will be able to understand,

1. Provide a glimpse of the various types of NoSQL databases with its features, suitable use case.
2. Provide the knowledge of different operations that performed on NoSQL databases.

Lab Assignments:

Aware students to any two NoSQL database technologies from given below and solve any two assignments.

1. Assignment 1 is based on MongoDB. (Document Database)
2. Assignment 2 is based on Neo4j. (Graph Database)
3. Assignment 3 is based on Cassendra (Column-Family stores)

Assignment 1

1. Downloading and Installation of MongoDB
2. Identify MongoDB environment
3. Using Mongo Shell
4. Configuration file in MongoDB
5. Database commands in MongoDB.
6. Connecting to the terminal – ('mongo' command)

Create any two collections and perform following queries on it –
(Eg. of collections :- Employee, Movie, Actor, Doctor, Student etc.)

1. Create Database ('use' command) & Create Collection ('createCollection' command) with atleast 4 fileds.
2. Insert atleast 10 records / documents in the collection , Insert multiple records. – ('insert' command)
3. Display the documents inserted in the collection.
4. Update record with given condition ('update')
5. Find the record in the collection. ('find' command)
6. Sort the record.('sort' operator)
7. Delete record ('remove')

Assignment 2: Basic commands of Neo4j –

1 Create the databases as graph models. (Neo4j database)
2. Visualize the models after creation
3. Add more labels, relationships and properties
3. Return properties of nodes, Return the nodes labels, Return the relationships with its properties.
4. Delete all nodes, labels and relationships.

Assignment 3 : Cassandra query language shell **(cqlsh)**

Cassendra cqlsh basic commands

- Help command
- Capture command
- Consistency command
- Copy command
- Describe cluster command
- Describe table
- Create keyspace
- Describe keyspace
- Use
- Alter keyspace
- Drop keyspace
- Truncate
- Create index
- Drop index
- Create table
- Delete table
- Expand command
- Show command

References:

1. "MongoDB: The Definitive Guide" by Kristina Chodorow.
2. "The Little MongoDB Book" by Karl Seguin.
3. MongoDB Manual on website MongoDB.com
4. http://nicholasjohnson.com/mongo/course/workbook/
5. https://neo4j.com/docs/operations-manual/current/tools/cypher-shell/
6. https://www.support.dbagenesis.com/post/neo4j-basic-commands
7. https://www.tutorialspoint.com/neo4j/index.htm
8. https://www.cloudduggu.com/cassandra/shell-commands/
9. https://data-flair.training/blogs/cassandra-shell-commands/

Savitribai Phule Pune University
M.Voc.(Software Development and Management)
Sem – I

Course Code: IT-531-RM
Course Name: Research Methodology (General/Subject Specific)
No. of Credits: 04 **Total Hours: 60**

Course Outcome: On completion of the course, student will be able to understand,

1. Understand of the fundamental concepts of research, including the research process, research questions, hypotheses, and variables.
2. Conduct a comprehensive literature review to identify relevant studies, synthesize existing knowledge, and identify research gaps.
3. Identify research problems, formulate research questions, and design appropriate methodologies to address these problems
4. Identify and select appropriate research designs, such as experimental, observational, survey, qualitative, or mixed-methods, based on the research objectives.
5. Apply appropriate data analysis methods, including statistical techniques or qualitative analysis, to draw meaningful conclusions from research data.
6. Develop a well-structured research proposal, outlining research questions, methodology, expected outcomes, and a rationale for the study.
7. Communicate research findings effectively through written reports, presentations, and academic papers.
8. Gain an appreciation for the importance of research in contributing to the advancement of knowledge in their field of study and broader society.
9. Understand the principles of research ethics and integrity

Chapter No	Course Contents	No. of Lectures	CO Targeted
1	**Introduction to Research Methodology** 1.1 Meaning of Research 1.2 Objectives of Research 1.3 Motivation in Research 1.4 Types of Research 1.5 Research Approaches 1.6 Significance of Research 1.7 Researcher and Characteristics of Researcher 1.8 Research Ethics and Integrity 1.9 Plagiarism and types of plagiarism 1.10 Introduction to Plagiarism check tools 1.11 Research Methods versus Methodology 1.12 Research and Scientific Method 1.13 Importance of Knowing How Research is Done	**10**	**CO1** **CO9**

	1.14 Criteria of Good Research		
2	**Literature Review and Formulation of Research Problems** 2.1 Research Process 2.2 Reviewing the literature: purpose of a literature review 2.3 Literature resources 2.4 The Internet and a literature review 2.5 The Internet and research strategies and methods 2.6 Conducting and Evaluating literature reviews 2.7 Formulation of research problem 2.7.1 What is a Research Problem? 2.7.2 Selecting the Problem 2.7.3 Necessity of Defining the Problem 2.7.4 Technique Involved in Defining a Problem	**6**	**CO1, CO2, CO3**
3	**Research Design** 3.1 Meaning of Research Design 3.2 Need for Research Design 3.3 Features of a Good Design 3.4 Important Concepts Relating to Research Design 3.5 Different Research Designs/Methods 3.5.1 Pure and Applied Research 3.5.2 Exploratory or Formulative Research 3.5.3 Descriptive Research 3.5.4 Diagnostic Research 3.5.5 Evaluation Studies 3.5.6 Action Research 3.5.7 Experimental Research 3.5.8 Analytical Study or Statistical Method 3.5.9 Historical Research 3.5.10 Surveys 3.5.11 Case Study 3.5.12 Field Studies	**8**	**CO3, CO4**
4	**Hypothesis and Sampling** 4.1 What is Hypothesis? 4.2 Nature & Characteristics of Hypothesis 4.3 Significance of Hypothesis 4.4 Types of Hypothesis 4.5 Sources of Hypothesis 4.6 Characteristics of Good Hypothesis 4.7 What is sampling? 4.8 Aims of Sampling 4.9 Characteristics of Good Sample 4.10 Basis of Sampling 4.11 Merits and demerits of Sampling 4.12 Sampling Techniques or Methods 4.13 Probability Sampling Methods 4.14 Non-Probability Sampling Methods 4.15 Sample Design and Choice of Sampling Technique	**10**	**CO5, CO6**
5	**Data Collection, Processing and Analysis of Data** 5.1 Collection of Primary Data	**10**	**CO5**

	5.2 Method of data Collections - Observation, Interview, Questionnaires and Schedules 5.3 Difference between Questionnaires and Schedules 5.4 Some Other Methods of Data Collection 5.5 Collection of Secondary Data 5.6 Selection of Appropriate Method for Data Collection 5.7 Case Study Method 5.8 Processing Operations and Some Problems in Processing 5.9 Elements/Types of Data Analysis 5.10 Statistics in Research 5.11 Measures of Central Tendency, Dispersion, Asymmetry (Skewness) 5.12 Measures of Relationship - Chi-Square, t-test, ANNOVA(f-test),Z-test 5.13 Simple Regression Analysis, and Multiple Correlation and Regression 5.14 Partial Correlation and Association in Case of Attributes 5.15 Quantitative and Qualitative Data Analysis Tools		
6	**Interpretation and Report Writing** 6.1 Meaning of Interpretation, Why Interpretation? 6.2 Technique of Interpretation 6.3 Precaution in Interpretation 6.4 Significance of Report Writing 6.5 Different Steps in Writing Report 6.6 Layout of the Research Report 6.7 Types of Reports (Research Proposal/Synopsis, Research Paper, and Thesis) 6.8 Oral Presentation 6.9 Mechanics of Writing a Research Report 6.10 Precautions for Writing Research Reports	**8**	**CO6, CO7, CO8**
7	**Publication Ethics and Open Access Publishing** 7.1 Publication ethics: definition, introduction and importance 7.2 Best practices/standards setting initiatives and guidelines: COPE, WAME, etc. 7.3 Conflicts of interest 7.4 Publication misconduct: definition, concept, problems that lead to unethical behaviour and vice versa, types 7.5 Violation of publication ethics, authorship and contributor ship 7.6 Identification of publication misconduct, complaints and appeals 7.7 Predatory publishers and journal 7.8 Open access publications and initiatives 7.9 SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies 7.10 Software tool to identify predatory publications developed by SPPU 7.11 Journal finder/ journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc. 7.12 E-Resources for research: Google Scholar, Shodh Ganaga, Shodh Gangotri	**8**	**CO7, CO9**

Reference Books:

1. Researching Information Systems and Computing by Briony J Oates, SAGE SOUTH ASIA Ed
2. Research Methodology: A Step-by-Step Guide for Beginners, Kumar, Pearson Education.
3. Research Methodology Methods and Techniques, Kothari, C. R., Wiley Eastern Ltd.
4. The Research Methods Knowledge Base, by William M. K. Trochim, James P. Donnelly
5. Introducing Research Methodology: A Beginner‟s Guide to Doing a Research Project, UweFlick
6. A Guide to Research and Publication Ethics by Partha Pratim Ray, New Delhi Publishers
7. RESEARCH & PUBLICATION ETHICS by Wakil kumar Yadav, NOTION PRESS
8. Practical Research Methods, Dawson, C., UBSPD Pvt. Ltd.

Semester-II

Savitribai Phule Pune University
M.Voc(Software Devlopment and Management)
Sem - II

Course code: SDM-551-MJ
Course Title: Artificial Intelligence

No. of Credits: 04 **Total Hours: 60**

Course Outcome:

1. To learn various types of algorithms useful in Artificial Intelligence (AI).
2. To convey the ideas in AI research and programming language related to emerging technology.
3. To understand the numerous applications and huge possibilities in the field of AI that goes beyond the normal human imagination
4. Identify Problems Were Artificial Intelligence Technique are Applicable

Chapter No.	Course Contents	No. of Hours	CO Targeted
1	**Introduction to Artificial Intelligence**: Introduction and Intelligent systems, What Is AI, The Foundations of Artificial Intelligence, The History of Artificial Intelligence, Applications of AI, Early work in AI and related fields, AI problems and Techniques.	9	CO1
2	**Searching**: -Defining AI problems as a State Space Search: example, Search and Control Strategies, Problem Characteristics, Issues in Design of Search Programs, Production System. **Blind Search Techniques:** -BFS, DFS, DLS, Iterative Deepening, Search, Bidirectional Search, Uniform cost Search. **Heuristic search techniques:** -Generate and test ,Hill Climbing, Best First search, Constraint Satisfaction, Mean-End Analysis, A*,AO*.	15	CO2
3	**Knowledge Representation:** Representations and Mappings, Approaches to Knowledge Representation, Knowledge representation method, Propositional Logic, Predicate logic, Representing Simple facts in Logic, Resolution, Forward and backward chaining . Game Playing- Minimax Search Procedures, Adding alpha-beta cutoffs.	12	CO3
4	**Introduction to AI with Python:** Introduction to Python , why python with AI, Features of Python, Basics of Python, Python statements, Methods & Functions using python, Basic and advanced modules &Packages, Python	12	CO4

	Decorators and generators .Advanced Objects & Data structures.		
5	**Machine Learning:** Why Machine learning, Types of Machine Learning: Supervised learning- Classification & Regression. Random Forest, KNN Algorithm. Unsupervised learning-Clustering & Association. Reinforcement learning	**12**	**CO1**

References Books:

1 Computational Intelligence ,Eberhart ,Elsevier Publication

2 Artificial Intelligence: A New Synthesis Nilsson ,Elsevier Publication

3 Artificial Intelligence with Python Prateek Joshi ,Packt Publishing Ltd

4 Reinforcement and Systematic Machine Learning for Decision Making, Parag Kulkarni Wiley-IEEE Press Edition

5 Artificial Intelligence Saroj ,Kausik Cengage Learning 6 Introduction to Machine Learning EthemAlpaydin, PHI 2nd Edition

Savitribai Phule Pune University

M.Voc (Software and Development and Management)

Sem-II

Course Code : SDM-552-MJ

Course Title: Retail Marketing Principles

No. of Credits: 04 **Total Hours: 60**

Course Outcome: On completion of the course, student will be able to understand,

CO1: Define the term marketing and explain its role and importance in an individual firm and the overall economy.

CO2: Identify and classify marketing segments and targets, demonstrating the use of marketing research techniques.

CO3: Explain the use of product mix and life cycle in a marketing strategy.

CO4: Define marketing channels and identify different marketing channels and develop distribution strategies.

Chapter No.	Course Contents	No. of Hours	CO Targeted
Unit-1	**Introduction**: • Meaning & definition of retail marketing, Importance of retail marketing; Retail marketing mix; Strategic marketing planning, • Market analysis and selection, • Retail marketing environment –macro and micro components and their impact on marketing decisions. Ethics & Social responsibility in retail marketing.	**10**	**CO1**
Unit-2	**Segmentation, Targeting and Positioning:** • Conditions for effective market segmentation, Benefits of • market segmentation, • Levels of market segmentation, Bases of market segmentation (Geographic, Demographic, Benefit/ USP, Behavioral, Psychographic, Geo-Demographic), • Target marketing: Meaning, importance & strategies. • Positioning: Concept & relevance, Strategies, • Bases of differentiation in positioning.	**18**	**CO2**
Unit-3	**Product & Pricing Decisions**: • Concept of a product, Classification of products, • Product line and product mix, Branding, Packaging and labeling. Product life cycle – strategic implications, New product development. • Pricing Decisions: Factors affecting price determination, Pricing policies and strategies,	**16**	**CO3**

	• Pricing Methods. • Discounts and rebates		
Unit-4	**Physical Distribution & Promotion Decisions:** • Nature, functions, and types of Distribution channels, • Channel management decisions. • Promotion Decisions: Promotion mix – advertising, personal selling, sales promotion, publicity and public • relations, • Determining advertising budget, copy designing and testing, Media selection, Advertising effectiveness.	**16**	**CO4**

References Books:

1. Gilbert, David, Retail Marketing Management, Prentice Hall, New Delhi.
2. Kotler, Philip, Marketing Management, Prentice Hall, New Delhi.
3. Grewal Dhruv, Retail Marketing Management-The 5 Ps of Retailing, Sage Publishing.
4. Saxena, Rajan, Marketing Management, Tata-McGraw Hill, New Delhi

Savitribai Phule Pune University
M.Voc.(Software Development and management)
Sem – II

Course code: SDM-553-MJ
Course Title: Machine Learning

No. of Credits: 02 **Total Hours: 30**

Course Outcome:

After successful completion of this course the student will be able to:

CO1. Recognize the characteristics of machine learning that make it useful to real-world problems.

CO2. Able to use regularized regression and Classification algorithms.

CO3. Evaluate machine learning algorithms and model selection.

CO4. Understand scalable machine learning and machine learning for IoT.

CO5. Understand Deep leaning and Expert system.

Chapter No.	Course Contents	No. of Hours	CO Targeted
1	**Introduction to Machine Learning**: • Types of Machine Learning Algorithms, Supervised Learning. • Unsupervised learning, Reinforcement Learning, Classification of Machine Learning Concept • Distance Based Machine learning Methods, K-Nearest Neighbor (kNN). Introduction to Clustering Techniques • Possible Applications, Requirements of clustering algorithm, Problems associated with using Clustering Technique • Types of Clustering Methods, Clustering Strategies.	7	CO1
2	**Classification / Regression:** • Classifications, decision tree learning, naive bayes • linear regression, logistic regression, Linear regression models • support vector machine, beyond binary classifications: multiclass or multinomial classification.	7	CO2
3	**Evaluating machine learning algorithms and model selection**: • Machine Learning Algorithms, Designing Machine Learning Algorithms • Classification Metrics Regression Metrics • Statistical Learning Theory • Ensemble Methods, What is Random Forest Sparse modeling and estimation: Time series	5	CO3

	• Deep (Structured) Learning, Neural Network, Applications of Deep Learning Methods • Feature Representation Learning.		
4	**Scalable machine learning :** • Machine Learning: Algorithms Types Revisited and modified, Semi-Supervised Machine Learning • Semi-Supervised Learning, When Can Semi-Supervised Learning Work?, Active (Machine) Learning • Graphical Model, Inference on Graphical Models, Probabilistic Graphical Models (PGM). **Machine learning & IoT** : • Internet of Things, Emergence of Internet of Things • The Architecture of IoT, Machine Learning Algorithm for IoT, Internet of Things Communication Protocols • The IoT Architectural Reference Model, Taxonomy of Machine Learning Algorithms • Research Trends and Open Issues.	**3**	**CO4**
5	**Deep Learning :** • Neurons, Linear Perceptrons as Neurons, Neural Nets Architecture/ Design • Working of Neural Nets, Layers of Neural Networks and Deep learning, Activation Functions • Feed Forward Neural Networks, Limitations of Neurons Deep Belief Networks (DBNs) Large Scale DBNs • Large Scale Convolutional Neural Networks • Deep Learning for Big Data, Deep Learning from High Volumes of Data, Deep Learning from High Variety of Data ,Deep Learning for High Velocity of Data • Local Minima in Deep Networks • Rearranging Neurons in a layer of a Neural Network, Spurious Local Minima in Deep Networks. **Expert System:** • Characteristics, Components, Development, Knowledge Engineering, Application.	**8**	**CO5**

References Books:

1.Rajiv Chopra, Machine Learning, Khanna Book Publishing, New Delhi.
2. Mitchell Tom, Machine Learning. McGraw Hill, 1997.
3. Ethem Alpaydin, Introduction to Machine Learning, PHI.

Savitribai Phule Pune University
M.Voc.- (Software Development and Management)
Semester- II

Course code: SDM-554-MJP
Course: Lab on IT Solutions in Retail

No. of Credits: 02 **Total Hours: 30**

Course Outcome: On completion of the course, student will be able to understand,

CO1: Define the term marketing and explain its role and importance in an individual firm and the overall economy.

CO2: Identify and classify marketing segments and targets, demonstrating the use of marketing research techniques.

CO3: Explain the use of product mix and life cycle in a marketing strategy.

CO4: Define marketing channels and identify different marketing channels and develop distribution strategies.

TOPICS:

1 Role of IT in Business
2 IT solutions and services for multi–channel retailing
3 Influencing Parameters for use of IT in Retailing
4 Efficiency in Operations Effective Management of Online catalogues
5 Direct Retailing Methods
6 Database Management
7 Data warehousing
8 Critical Analyses of E-Retailing Strategies
9 Introduction of RFID and other emerging technology
10 Modules in retailing, Service quality dimensions- CRM approaches in retailing.
11 Real- Time Inventory and Vendor Management

Note: Students are required to prepare practical file.
Evaluation of Marks will be as follows:
a. Evaluation by internal examiner: 15 Marks
b. Practical File Evaluation and Viva Voce examination by external examiner: 35 Marks

SUGGESTED READINGS:

1. Internet Marketing: Strategy, Implementation and Practice by Dave Chaffey.
2. Principles of Marketing by Philip Kotler.
3. Information Technology for Retail, Girdhar Joshi, Oxford Printing Press
4. Swapana Pradhan, Retailing Management, Tata McGraw Hill Publishing Company

Savitribai Phule Pune University
M.Voc.- (Software Development and Management)
Semester- II

Course code: SDM-555-MJP
Course Title: Lab Course on Artificial Intelligence

No. of Credits: 02 **Total Hours: 30**

Course Outcome: On completion of the course, student will be able to understand,
CO1 Develop an intelligent game-playing agent using search algorithms.
CO2 Build and evaluate machine learning models for classification and regression tasks.
CO3 Develop a reinforcement learning agent capable of learning from interactions.
CO4 Apply ethical considerations and AI safety principles in AI development.
CO5 Identify problems where artificial intelligence techniques are applicable.

Lab assignments using Python:

1: Subject teacher should conduct first lab practical on basic programs using python for introducing and using python environment such as, a) Program to print multiplication table for given no. b) Program to check whether the given no is prime or not. c) Program to find factorial of the given no and similar programs.
2: Write a program to implement List Operations(Nested list, Length, Concatenation, Membership ,Iteration ,Indexing and Slicing), List Methods(Add, Append, Extend & Delete)
3: Write a program to Illustrate Different Set Operations.
4: Write a program to implement Simple Chatbot.
5: Write a program to implement Breadth First Search Traversal.
6: Write a program to implement Depth First Search Traversal.
7: Write a program to implement Water Jug Problem.
8: Write a program to implement K -Nearest Neighbor algorithm.
9: Write a program to implement Regression algorithm.
10: Write a program to implement Random Forest Algorithm.
These practical assignments provide a hands-on experience with AI using Python, and they cover a diverse range of AI topics and applications.

Savitribai Phule Pune University
M.Voc(Software Development And Management)
Sem - II

Course code: IT-560-MJ
Course Title: Jquery

No. of Credits: 02 **Total Hours: 30**

Course Outcome: On completion of the course, student will be able to understand,
CO1 Design and build rich interactive web applications
CO2 Creating interactive user interface.
CO3 The jQuery library makes it easy to manipulate a page of HTML after it's displayed by the browser.
CO4 Simplifies complicated tasks like AJAX calls and DOM manipulation

Chapter No.	Course Contents	No. of Lectures	CO Targeted
1	**1: Introduction** • jQuery Introduction • Install and Use jQuery Library • Un-Obstructive JavaScript • First jQuery Example • jQuery Syntax • How to escape a special characters	4	CO2
2	**Selectors , Attributes, Events and Traversal** • jQuery Selector, • Basic Selectors, • Handling attributes • Mouse Events, • Keyboard Events , • Form Events , • Document Events, • Traversal Functions	8	CO3
3	**HTML Manipulation, DOM Manipulation** • Getting Setting values from elements • Inserting New elements • Deleting/Removing elements • CSS manipulations • Dimensions • Positioning	6	CO4
4	**Effects** • Showing/Hiding elements	4	CO1

	• Sliding elements • Fading elements • Deleting animation elements • Custom animation		
5	**Ajax and JSon** • Ajax with jQuery • Load method • jQuery get and getJson methods • jQuery POST request • Retrieving js file • Helper methods	**8**	**CO4, CO1**

Reference Books:

1. Beginning Angular JS – by Andrew Grant Published by Apress Publication
2. Learning AngularJS – by Ken Williamson Published by O'Reilly Media
3. The ng-book: A Complete Book on Angularby Felipe Coury, Ari Lerner, Carlos Taborda Published by Fullstack.io gistia
4. Angular: Up and Running: Learning Angular, Step by Step - by Shyam Seshadri Published by O'Reilly
5. Angular: From Theory To Practice- by Asim Hussain Published by CodeCraft
6. Angular 6 for Enterprise-Ready Web Applications- by Doguhan Uluca Published by Packt Publishing
7. Angular in Action - by Jeremy Wilken Published by Manning Publications

Savitribai Phule Pune University
M.Voc.(Software Development)
Sem - II

Course code: SDM-561-MJP
Course Title: Lab Course on Jquery

No. of Credits: 02 **Total Hours: 30**

Course Outcomes: On completion of the course, student will be able to understand,
CO1: Understand the JavaScript language & the Document Object Model.
CO2: Implementing validation with XHTML forms.
CO3: Creating a simple image slideshow.
CO4: Updating a web basic website project.

Sr. No.	Lab Assignments:	CO Targeted
1	Write a jQuery code to check whether jQuery is loaded or not	**CO1**
2	Write a jQuery code to check whether jQuery code to scroll web page from bottom and vice versa.	**CO1**
3	Write jQuery code to disable right click menu in html page	**CO2**
4	Write jQuery code to Fix broken images automatically	**CO3**
5	Write jQuery code to Blink text	**CO1**
6	Write jQuery code to fix broken images automatically	**CO3**
7	Write jQuery code to print a page.	**CO1**
8	Write jQuery code to allow user to enter only 15 characters in text box	**CO1**
9	Write jQuery code to underline all the words of a text	**CO1**
10	Write jQuery code to get the value of a textbox	**CO1**
11	Write jQuery code to add options to a drop-down list.	**CO1**
12	Write jQuery code to display form data on the browser	**CO4**
13	Write jQuery code to remove a specific value from an array.	**CO1**
14	Write jQuery code to check an object is a jquery object or not.	**CO2**

15.	Write jQuery code to select values from JSON object.	**CO2**
16.	Write jQuery code to disable a link.	**CO4**
17.	Write jQuery code to count the number of rows and columns in a table.	**CO1**
18.	Write jQuery code to set the background-image to the page	**CO3**
19.	Write jQuery code to remove all CSS classes from an application	**CO4**
20.	Write jQuery code to find absolute value of an element.	**CO1**

Reference Link :

https://jquery.com/
https://www.w3schools.com/jquery/
https://www.javatpoint.com/jquery-tutorial

Savitribai Phule Pune University
M.Voc.- (Software Development and Management)
Semester- II

Course code: SDM-562-MJ
Course Title: Digital Marketing

No. of Credits: 02 **Total Hours: 30**

Course Outcome: On completion of the course, student will be able to understand,

CO1: Analyze the use of different forms of digital marketing in the development of an online presence.

CO2: Assess the different social media marketing strategies, impact of digital technology on the practice of marketing.

CO3: Learn concepts such as Data Driven Marketing, Social Media Marketing, Analytics and Inbound Marketing

CO4: Understand the concept of Search Engine Optimization, Ecommerce Marketing, Content Marketing, Online Reputation Management, and Affiliate Marketing Basics.

Chapter No.	Course Contents	No. of Hours	CO Targeted
Unit-1	**Introduction:** • Concept of Digital Marketing, • Overview to Digital Marketing, Why Digital Marketing is necessary in present time, • Marketing Environment, Targeting and Positioning, Website planning & Creation, Content writing.	**8**	**CO1**
Unit-2	**Social Media:** • Social Media Marketing, Social Media Metrics, Mobile Marketing, • Data Driven Marketing • Strategy, Visual Social Marketing, • Inbound Marketing, you tube Marketing.	**12**	**CO2**
Unit-3	**Areas of Digital Marketing:** • Email Marketing, Lead Generation, Google Ad Words, Google Analytics, • Pay-Per-Click Advertising, Facebook Marketing, LinkedIn Marketing, Twitter Marketing, • Video • Marketing, Instagram Marketing.	**6**	**CO3**
Unit-4	**Search Engine Optimization (SEO):** • Online Display Advertising, Ecommerce Marketing, • Mobile Web Marketing, Content Marketing, Online Reputation Management, Affiliate Marketing Basics,	**4**	**CO4**

	• Ad sense & Blogging, How To Grab Freelancing Projects.		

References Books:

1. Fundamentals of Digital Marketing by Pearson- by Puneet Singh Bhatia

2. Digital Marketing (English, Paperback, Seema Gupta) Edition: 1, 2017, Publisher: McGraw-Hill.

3. Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation

Paperback,2016 by Damian Ryan

4. Digital Analytics for Marketing 1st Edition, Kindle Edition by Marshall Sponder, Gohar F. Khan

Savitribai Phule Pune University
M.Voc.- (Software Development and Management)
Semester- II

Course code: SDM-563-MJP
Course Title: Lab Course on Digital Marketing

No. of Credits: 02 **Total Hours: 30**

Course Outcome: On completion of the course, student will be able to understand,

1 To learn digital marketing tools like search engine optimization and associated analytics.

2 To apply digital marketing tools to

a) Improve websites' rankings and optimize it in the process.

b) Improve the brand's visibility

c) Improve brands reach which physically is relatively difficult and less effective.

3 To analyze relative importance of digital marketing strategies to optimize digital marketing campaign

Chapter No.	Course Contents	No. of Hours	CO Targeted
Unit-1	**Creating the Webstore** • registering domain name, • Web hosting, search engine application, search • engine optimization, use of keywords, backlinks, directory submissions, search engine marketing, adwords, using adword planner, • Bidding for keywords, ad rank.	**8**	**CO1**
Unit-2	**Social Media Marketing** • Facebook Marketing Strategies and Implementation, Creating Banners • for Facebook, YouTube Marketing Strategies and Implementation, Creating YouTube Videos, • Twitter Marketing Strategies and Implementation, Using Tweets, Retweets and Hashtags for • Marketing, , LinkedIn Marketing Strategies and Implementation, Creating LinkedIn Pages for • Companies, Instagram Marketing Strategies and Implementation, Creating banners and videos for Instagram Marketing.	**12**	**CO2**
Unit-3	**Introduction to Web Analytics** • Application of Google Analytics, Application of Facebook • Analytics, Application of Twitter Analytics, Application of YouTube Analytics, Application of	**10**	**CO3**

	Instagram Analytics, Analyzing Exit Rate, Bounce rate, Click-Through Rate(CTR), Conducting A/B Tests.		

References Books:

1. Fundamentals of Digital Marketing by Pearson- by Puneet Singh Bhatia

2. Digital Marketing (English, Paperback, Seema Gupta) Edition: 1, 2017, Publisher: McGraw-Hill.

3. Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation

Paperback,2016 by Damian Ryan

Savitribai Phule Pune University
M.Voc.(Software Development and Management)
Sem – II

Course Code: SDM-564-MJ
Course Name: Cloud Computing

No. of Credits: 02 **Total Hours: 30**

Course Outcome: After successful completion of this course the student will be able to:
1. Describe fundamental knowledge of cloud computing.
2. Analyze the Cloud Principles of Parallel and Distributed Computing.
3. Apply and design suitable Virtualization concept.
4. Analyze cloud computing architecture.
5. Discuss societal issues by addressing Cloud Platforms in Industry.

Chapter No.	Course Contents	No. of Lectures	CO Targeted
1	**Introduction:** Cloud computing at a glance, The vision of cloud computing, Defining a cloud, A closer look, The cloud computing reference model, Characteristics and benefits, Challenges ahead, Historical developments, Distributed systems, Virtualization, Web 2.0, Service-oriented computing, Utility-oriented computing, Building cloud computing environments, Application development, Infrastructure and system development, Computing platforms and technologies.	4	CO1
2	**Principles of Parallel and Distributed Computing:** Eras of computing, Parallel vs. distributed computing, Elements of parallel computing, What is parallel processing?, Hardware architectures for parallel processing, Approaches to parallel programming, Levels of parallelism, Laws of caution, Elements of distributed computing, General concepts and definitions, Components of a distributed system, Architectural styles for distributed computing, Models for interprocess communication, Technologies for distributed computing, Remote procedure call, Distributed object frameworks, Service-oriented computing.	7	CO2
3	**Virtualization:** Introduction, Characteristics of virtualized environments, Increased security, Managed execution, Portability, Taxonomy of virtualization techniques, Execution virtualization, Other types of virtualization, Virtualization and cloud computing, Pros and cons of virtualization, Advantages of virtualization, The other side of the coin: disadvantages, Technology examples, Xen: paravirtualization, VMware: full virtualization, Microsoft Hyper-V.	6	CO3
4	**Cloud Computing Architecture:** Introduction, The cloud reference model, Architecture, Infrastructure- and hardware-as-a-service, Platform as a service, Software as a service, Types of clouds, Public	7	CO4

	clouds, Private clouds, Hybrid clouds, Community clouds, Economics of the cloud, Open challenges, Cloud definition, Cloud interoperability and standards, Scalability and fault tolerance, Security, trust, and privacy, Organizational aspect.		
5	**Cloud Platforms in Industry:** Amazon web service, Compute services, Storage services, Communication services, Additional services, Google AppEngine, Architecture and core concepts, Application life cycle, Cost model, Observations, Microsoft Azure, Azure core concepts, SQL Azure, Windows Azure platform appliance, Observations.	**6**	**CO5**

Reference Books:

1. Anthony T.Velte, Toby J.Velte and Robert E, Cloud Computing – A Practical Approach, TMH 2010

2. Michael Miller, Cloud Computing – Web based Applications, Pearson Publishing, 2011

Savitribai Phule Pune University
M.Voc.(Software Development & Management)
Sem – II
Course Code: SDM-565-MJP
Course Name: Lab Course on Cloud Computing
No. of Credits: 02 **Total Hours: 30**

No. of Credits: 2	**Teaching Scheme** Theory: 4 Hrs/Week	**Examination Scheme** Continuous Evaluation: 15 MarksEnd Semester : 35 Marks

Prerequisite

- Operating System
- Fundamentals of Computer Networks
- Good Understanding of Object Oriented Programming Concepts

Objectives

1. To understand the principles and paradigm of Cloud Computing
2. To appreciate the role of Virtualization Technologies
3. Ability to design and deploy Cloud Infrastructure
4. Understand cloud security issues and solutions

Course Outcomes On Completion of this course, student will be able to

CO1: To understand the principles of cloud computing

CO2: To understand the importance of virtualization and how it has helped the development of cloud computing.

CO3: To understand the concept of cloud security.

CO4: To design and deploy cloud infrastructure.

Assign No.	**Name of Practical Assignment**
1	Working and Implementation of Infrastructure as a service.
2	Working and Implementation of Software as a service.
3	Working and Implementation of Platform as a services
4	Practical Implementation of File sharing and Storage as a Service
5	Create Google form for accepts details of student and create test page and generate result
6	Working and Implementation of identity management.
7	Write a program for web feed.
8	Demonstration and implementation of cloud on single sign on.
9	Practical Implementation of cloud security.
10	Installing and Developing Application Using Google App Engine.
11	Implement VMWAreESXi Server
12	Managing and working of cloud xen server.
13	Working with Aneka and demonstrate how to Managing cloud computing Resources.

14	Create a Virtual Machine using Virtual Box.
15	Create and host static web page using any cloud provider.
16	Demonstrate how to managing cloud computing Resources.
17	Using OpenNebula to manage heterogeneous distributed data centre Infrastructure.

Reference Books:

1. Brian J.S. Chee and Curtis Franklin : Cloud Computing: Technologies and Strategiesof the Ubiquitous Data Center
2. Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi : Mastering Cloud Computing: Foundations and Applications Programming
3. Kai Hwang, Geoffrey C Fox, Jack G Dongarra : Distributed and Cloud Computing,From Parallel Processing to the Internet of Things

Savitribai Phule Pune University
M.Voc.(Software Development & Management)
Sem – II
Course Code: IT-581-OJT

Course Name: On Job Training (Internship)

No. of Credits: 04 **Total Hours: 120**

Course Outcome: On completion of the course, student will be able to understand,

1. To provide students with practical, hands-on-experience in applying theoretical knowledge to real-world tasks.
2. To help students develop and enhance their skills, problem solving abilities and work culture of the industry.
3. To foster effective teamwork and collaboration skills.
4. To encourage students to build and expand their professional network by interactive with experienced experts and mentors in industry.

Guidelines for On Job Training (IT-581-OJT):

- Students must start the OJT/Internship immediately after Semester-II examination during the summer vacation.
- Students are expected to complete the IT related work/Project within 120 hours assigned by Company/Industry/Consultancy/Institution.
- College should assign the mentor for group of 10 students to monitor the progress throughout the OJT.
- Students have to submit the weekly progress report duly signed by the concern authorities of company to the mentor.
- At the end of OJT, students should prepare documentation and submit a report.
- The final presentation and documentation will be evaluated by the Examination panel.