DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dantpalle K.K **Department: Comp. science**

Program: MSC FY **Subject**: Comp. Science

Course Code: **SCMPSC-401** **Paper Title: Comp. Archi & Microprocessor**

Unit Number	Unit Name	Topics	Unit-wise Outcome
1	**Design Methodology**	Evolution of Computers, Introduction to system modeling, DesignMethodology of Combinational and Sequential circuits-Gate level, Register level and Processor level.	Classify the computer designing
2	**Binary Arithmetic**	Fixed point arithmetic's and algorithms for addition, subtraction, multiplication and division, Floating point arithmetic's and algorithms for addition, subtraction.	Classify the binary architecture
3	**Processors Design & Control Units**	CPU organization, Data representation, Instruction Sets –Format, types, Implementation, CICS and RISC, Control Unit-Hardwired control and design examples, Micro programmed control unit, pipeline control, Interrupt and their types and Branch Instruction processing.	Classify the designing of process & controlling unit of microprocessor
4	**Memory Organization**	Memory Technologies, Memory System, Virtual memory, Memory hierarchies, Main memory -allocation, Segmentation, High speed-Cache Memory, interleaved and associative memories.	Analyze the memory structure of microprocessor
5	**8085 Microprocessor**	Architecture of 8085 Microprocessor, Features of 8085, Timing diagram of Memory read, memory write, Op code fetch and execute cycle.	To aware students about Basics of Microprocessor &

			Assembly Language Programming
6	**8086 Microprocessor**	Architecture of 8086 Microprocessor-EU and BIU, features of 8086, Pin diagram of 8086, Addressing modes, Instruction set classification, Assembly language programming of 8086.	To aware students about Basics of Microprocessor & Assembly Language Programming

Specify Course Outcome: After successful completion of this course, students should be able to:

i. Students will acquire skill of Assembly Language programming using 8086 Microprocessor

ii. Student will be familiar with Internal Processing of Computers.

Specify Program Outcome. To develop Understanding of Internal Architecture of Computer.

ii. To aware students about Basics of Microprocessor & Assembly Language Programming

Signature of Teacher

Dantpalle K.K

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College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Shejul B.V **Department: Computer Science**

Program: MSC FY **Subject**: Comp. Science

Course Code: **SCMPSC -402** **Paper Title: Python programming**

Unit Number	Unit Name	Topics	Unit-wise Outcome
1	Introduction and basic control structure of Python	Introduction and Features of Python, Data Types, Variables, Operators, Control Structures: Loops and Decision.	Learn python and its features, data types, variables and loops and decision
2	Data Types and Classes	.Data Types: Numerical, String, Set, Dictionary, List, Tuple, Classes and Objects, Functions and Arguments, Inheritance, Polymorphism.	Utilize data types, class and objects and polymorphism
3	Classes	Classes and Objects, Functions and Arguments, Inheritance, Polymorphism.	Understand functions, argument and polymorphism
4	Modularization and Exceptions	Standard Modules, Packages, Exception raising, Exception Handling, Error Processing.	Learn standard modules,packages,and error processing
5	Database Connectivity with MySQL, GUI Programming and Database Connectivity Using Python	Getting MySQL for Python, connecting with database, Passing Query to MySQL. GUI using Tkinter Module, Creating Label, Text, Button, Info Dialog Boxes, Radio button, Check button, Importing MySQL for Python, connecting with database, Passing a query to MySQL.	Utilize getting MySQL for python, creating lable,importing MySQL for python and passing query to MySQL
6	Web Development using Python	Django Installation, Creating Project, Creating Application, Templates and Models, Data Manipulation, Django Admin, Django Syntax- variables, tags, if-	Learn Django installation, creating project,if else, loops

		else, loops, Database Connection with MySQL	and database connection with MySQL

Specify Course Outcome: After successful completion of this course, learner will be able to
1. Write programs using Python programming constructs.
2. Design and Develop applications using Python programming.
3. Design object oriented programs with Python classes.
4. Use exception handling in Python applications for error handling
.5. Design and Develop applications connecting with database.

Specify Program Outcome:
1. To understand why Python is a useful scripting language for developers. 2. To define the structure and components of a Python program.
3. To understand programming constructs in Python.
4. To acquire Object Oriented Skills in Python
5. To develop the ability to write database applications in Python

Signature of Teacher

Shejul B.V

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College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Muley S.M **Department: Computer Science**

Program: MSc FY **Subject**: **Computer Science**

Course Code: SCMPSC-403

Paper Title: ADV.JAVA

Unit Number	Unit Name	Topics	Unit-wise Outcome
1	**Multithreading**	Introduction to multithreading, Creating Threads, Thread Life Cycle, Thread Priorities, Thread Synchronization	Comprehend the fundamentals of multithreading, including threads, processes, and concurrency.
2	**Collection Framework**	Collection interface, Array List, Vector, Generics, Iterator, Comparable, Tree Set, Hash Set, Hash Map, Hash Table, Tree Map	Comprehend the architecture and components of the Java Collection Framework.
3	**Java Database Connectivity**	JDBC Introduction, JDBC Architecture, JDBC Drivers, Establishing Connection, Executing Query and Processing Results, Metadata, Prepared Statement, Callable Statement	Understanding JDBC Architecture and Comprehend the structure and components of JDBC.

4	**Introduction to Servlets**	Introduction to Servlets, Deploying Simple Servlet, Servlet Life Cycle, Get and Post Requests, Request Object	Ability to create web applications using Java Servlets.
5	**Handling Form Data**	Accessing Data from HTML Form, Using JDBC in Servlet, Servlet Chaining, Cookies and Sessions	Learn how to crate html form using jdbc in servlet
6	**JSP**	Introduction to JSP, Scripting Elements- Expressions, Script lets, Declarations, Directives, Sessions in JSP, Using JDBC in JSP, JavaBeans in JSP	Develop dynamic web content using JSP.

Specify Course Outcome: After successful completion of this course, students should be able to

i. Create dynamic and interactive web sites and interaction with client and server.
ii. Do server side programming with java Servlets and JSP.
iii. Implement different data structure using collection framework

.

Specify Program Outcome to Design and build robust and maintainable web applications.
ii To create dynamic HTML content with Servlets and Java Server Pages, using the JSP Standard Tag Library (JSTL).
iii To Make Servlets and JSP work together cleanly.

Signature of Teacher

Muley S.M

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dantpalle K.K **Department: Computer science**

Program: MSc fy **Subject**: computer science

Course Code: SCMPSCP-401

Title: Comp.arch. & Microp.Lab

Sr.no	program	Program outcomes
1.	8 BIT DATA ADDITION	Understand and apply the fundamentals of assembly level programming of microprocessors and microcontroller
2.	8 BIT DATA SUBTRACTION	
3.	8 BIT DATA MULTIPLICATION	
4.	8 BIT data DIVISION	
5.	16 bit data ADDITION	
6.	16 bit data subtraction	
7.	16 bit data MULTIPLICATION	
8.	16 bit data division	
9.	LARGEST ELEMENT IN AN ARRAY	
10.	SMALLEST ELEMENT IN AN ARRAY	
11.	PIN Diagram of 8085	
12.	Assembly language programming of 8085	

13.	1's complement of 8 bits numbers	
14.	1's complement of 16 bits numbers	
15.	Architecture of 8085 microprocessor	

Specify Course Outcome: The goal of this course is to have students understand and appreciate the principles of computing hardware and how it interfaces to software. It would provide the students the understanding of system-level programming and provide a high-level understanding of the role played by compilers, assemblers, instruction sets, and hardware

Specify Program Outcome:

i.To develop Understanding of Internal Architecture of Computer.

ii. To aware students about Basics of Microprocessor & Assembly Language Programming

Signature of Teacher

Dantpalle K.K

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College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Shejul B.V **Department: Computer Science**

Program: MSc FY **Subject**: Computer Science

Course Code: SCMPSCP-402

Paper Title: : Python Programming

no	Program	pro Outcome
1	Write a program to demonstrate different number data types in Python.	To be able to introduce core programming basics and program design with functions using Python programming language. To understand a range of Object-Oriented Programming, as well as in-depth data and information
2	Write a program to perform different Arithmetic Operations on numbers in Python.	
3	Write a program to create, concatenate and print a string and accessing sub-string from a given string.	
4	Write a program to create, append, and remove lists in python.	
5	Write a program to demonstrate working with tuples in python.	
6	Write a program to demonstrate working with dictionaries in python	
7	Write a python program to find largest of three numbers.	
8	Write a python program to find factorial of a number using Recursion.	
9	Write a python program to define a module and import a specific function in that module to another program.	
10	Write a Python class to reverse a string word by word.	
11	Program to demonstrate database connectivity	
12	Program to demonstrate exception handling	

13	Program to demonstrate inheritance and its types	processing techniques.
14	Program to demonstrate polymorphism	
15	Program to demonstrate different collections	

Specify Course Outcome: Upon the completion of Operating Systems practical course, the student will be able to: • Student should be able to understand the basic concepts scripting and the contributions of scripting language • Ability to explore python especially the object oriented concepts, and the built in objects of Python.

Specify Program Outcome: • To be able to introduce core programming basics and program design with functions using Python programming language. • To understand a range of Object-Oriented Programming, as well as in-depth data and information processing techniques. • To understand the high-performance programs designed to strengthen the practical expertise

Signature of Teacher

Shejul B.V

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Muley S.M **Department:** Computer science

Program: MSc FY **Subject**: computer science

Course Code: SCMPSCP-403

Paper Title: ADV.JAVA

no	Program	pro Outcome
1	Write a program for demonstration of creating multiple threads.	To Design and build robust and maintainable web applications. ii To create dynamic HTML content with Servlets and Java Server Pages, using the JSP Standard Tag Library (JSTL).
2	Write a program for demonstration of thread methods.	
3	Write a program for demonstration of thread synchronization.	
4	Write a program for demonstration of creating frame and layout managers.	
5	Write a program for demonstration of using AWT controls.	
6	WAP to show connectivity with database using JDBC	
7	WAP in Servlets to get and display value from an HTML page	
8	Write a program for demonstration of Action Event.	
9	Write a program for demonstration of creating Applet.	
10	Write a program for demonstration of passing parameters to Applet.	
11	Write a program for demonstration of accessing data from database.	
12	Write a program for demonstration of modifying data from database.	

13	Write a program for demonstration of Array List and Linked List.	
14	Write a program for demonstration of creating servlet application	
15	Write a program for demonstration of creating jsp application.	

Specify Course Outcome: Understand the concepts related to Java Technology.
Create dynamic web pages, using Servlets and JSP Make a reusable software component, using Java Bean and Students learn to access database through Java programs, using Java Database Connectivity (JDBC)

Specify Program Outcome: Explore advanced topic of Java programming for solving problems. Provide a sound foundation to the students on the concepts, precepts and practices, in a field that is of immense concern to the industry and business

Signature of Teacher

Muley S.M

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College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Khairajani S.U **Department:** Comp. Sci

Program: MSC FY SEM I **Subject**: comp Science

Course Code-SCMPSCE-401C **Paper Title:** Web Tech.

Unit Number	Unit Name	Topics	Unit-wise Outcome
	Introduction of HTML Documents	Historical Roots of HTML, Web page, Website, Structure of HTML documents and Basic Tags: HTML, HEAD, TITLE, BODY, Formatting Tags: Paragraph Tags, List tags, HR Tag., Headings Tags, PRE tag, DIV tag, SPAN tag., FONT Tag, ADDRESS tag, MARQUEE tag., Text-Level Elements & other different formatting tags	Grasp the fundamental concepts of HTML (Hypertext Markup Language).
	Technologies for Web Application	WWW, Web browser, U.R.L. concept, Web server, Web protocols: HTTP, FTP, Telnet, Hyperlink (Anchor) Tag & it's all attributes, Creating Email Hyperlinks (using mail to anchor)	Understand the technologies for web application

	Use of Image and Table	The Role of Images on the Web, tag & it's all attributes, Using Images create a links., Tables in HTML: - TABLE, TR, TH, TD tag with example, table with all Attributes	Learn how to insert image and tables in website
	Basic Interactivity and DHTML	Frames in HTML: FRAMESET & FRAME tags & its attributes, Simple Frame Example, Forms in HTML: Introduction to forms, FORM element & it's attributes (Action, Method (GET, POST), Name), Form controls: Text Controls, Password Field, Multiline Text Input, Pull-Down Menus, Check Box, Radio Buttons, Scrolled List, Reset Button and Submit button.	Understand how to create forms and using attributes.
	DHTML, CSS & JavaScript	Introduction of DHTML, Ramifications of DHTML, Rollover Buttons, Introduction to Cascading Style Sheets, Types of CSS. Introduction of JAVA Script, Adding script to documents with example, Variables, Use of different variable, Input and Output statements of JAVA Script , Validating form	Develop the modern web pages using the HTML and CSS features with different layouts as per need of applications and Use the JavaScript to develop the dynamic web pages.
	Web Publishing and Advanced HTML Concepts	Publishing the Site, The Realities of Publishing and Maintaining a Web Site, introduction of Search engine optimization, Meta – Information, Overview of Client/Server Programming on the Web.	Understand publishing of web site and advanced concept of HTML

Specify Course Outcome: I. Describe the concepts of WWW including browser and HTTP protocol.
ii. List the various HTML tags and use them to develop the user friendly web pages.
iii. Define the CSS with its types and use them to provide the styles to the web pages at various levels.
iv. Develop the modern web pages using the HTML and CSS features with different layouts as per need of applications.
v. Use the JavaScript to develop the dynamic web pages. vi. Use server side scripting with PHP to generate the web pages dynamically using the database connectivity

.

Specify Program Outcome. To impart basic Web Designing skills.
ii. To provide the in-depth knowledge about Static and Dynamic Web Designing and make them ready for designing such websites
iii. Develop the modern Web applications using the client and server side technologies and the web design fundamentals

Signature of Teacher

Khairajani S.U.

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College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Thite S.M **Department:** Computer Science

Program: MSc Fy **Subject**: Computer Science

Course Code: SVECR-401

Paper Title: Research methodology

Unit Number	Unit Name	Topics	Unit-wise Outcome
1	Introduction, the Purpose and Product of Research	What is research?, Evaluating Research, The 6Ps of research, Reasons for doing Research, possible products, Finding and choosing research topics, evaluating the purpose and product of research.	. Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.
2	Overview of the Research Process, Internet Research	A model of the research process, Alternative models of the research process, evaluating the research process, Background of the Internet and WWW, Internet research topics, The Internet and a literature review, The Internet and research strategies and methods,	Evaluate different models for research by using internet.

		Internet research, the law and ethics.	
3	Reviewing the literature, Surveys and Design Creation	Purpose of literature review, literature resources, The Internet and literature reviews, conducting literature reviews, evaluating literature reviews, Define Surveys, Planning and Designing surveys, the internet and surveys, Example of Surveys, Defining design and creation, Planning and conducting design and creation research, Creative computing and digital art.	Evaluation of literature, surveys for research
4	Experiments, Case studies, Action Research	Defining experiments, Planning and conducting experiments, The internet and experiments, Defining case studies, Planning and conducting case studies, The internet case studies Defining Action research, Planning and conducting Action research, The internet and Action research,	Case studies used for improvement of research work.
5	Interviews, Observations, Questionnaires	Defining Interviews, Planning and conducting Interviews, Group Interviews Internet based Interviews, Defining Observations, Planning and conducting systematic Observations, Planning and conducting participant Observations, The internet and Observations.	Evaluation of interview for research
6	Quantitative data analysis, Qualitative data analysis and	Defining Quantitative data analysis, Types of Quantitative data analysis, Data coding, Visual aids for Quantitative	Understand the Quantitative data analysis

	Presentation of Research	data analysis, Using statistics for Quantitative data analysis, Qualitative data analysis- Introduction, Analysis textual data, Analyzing non-textual qualitative data, Grounded theory, Presentation of Research- writing up the research, conference paper presentations, Posters and exhibitions, software demonstrations, Presenting yourself, PhD vivas, Research Ethics, Plagiarism, software to detect plagiarism	

Specify Course Outcome:

- Students who complete this course will be able to understand and comprehend the basics in research methodology and applying them in research/ project work.
- This course will help them to select an appropriate research design.
- With the help of this course, students will be able to take up and implement a research project/ study.
- The course will also enable them to collect the data, edit it properly and analyses it accordingly. Thus, it will facilitate students' prosperity in higher education
. • The Students will develop skills in qualitative and quantitative data analysis and presentation.
- Students will be able to demonstrate the ability to choose methods appropriate to research objectives

Specify Program Outcome:. The main objective of this course is to introduce the basic concepts in research methodology in Social science. This course addresses the issues inherent in selecting a research problem and discuss the techniques and tools to be employed in completing a research project. This will also enable the students to prepare report writing and framing Research proposals.

Signature of Teacher:

Thite S.M

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College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Khairajani S.U. **Department:** Computer science

Program: MSc FY **Subject**: computer science

Course Code: SCMPSE-401C

Title: Lab (Web Tech**)**

Sr no	programs	Pro outcomes
1.	Write an html program to create the tables	Understand the origins of HTML (Hypertext Markup Language) and its development over time. Gain insight into how HTML serves as the foundational language for building web pages and websites. Understand the concept of the World Wide Web (WWW) as a global information system where documents and resources are accessed over the internet.
2.	Create a web page with anchor tag with all attributes.	
3.	Write an html program to create web page with a blue background and text	
4.	Create a web page for p, font, address, marquee tags.	
5.	Write HTML code to design a page containing some text in a paragraph by giving suitable heading style.	
6.	Design a page having suitable background color and text color with title "My First Web Page" using all the attributes of the Font tag.	
7.	Write HTML code to create a Web Page that contains an Image at its center.	

8.	Create a web page with an appropriate image towards the left hand side of the page, when user clicks on the image another web page should open.	
9.	Create a web page, showing an ordered list of all second semester courses	
10.	Use tables to provide layout to your HTML page describing your college infrastructure.	
11.	Create a webpage with HTML describing your department use paragraph and list tags.	
12.	Apply various colors to suitably distinguish key words, also apply font styling like italics, underline and two other fonts to words you find appropriate, also use header tags.	
13.	Insert an image and create a link such that clicking on image takes user to other page.	
14.	Wap in html to create a webpage with four frames (Picture, table, list, and hyperlink).	
15.	Create a web page for CSS of embedded styles	

Specify Course Outcome:

The main objective of Office Automation is to enhance and upgrade the existing system by increasing its efficiency and effectiveness. It will simplify the task and reduce the paper work means the software improves the working methods by replacing the existing manual system with the computer-based system. To improve the skill to create the static web page. To develop the ability to create the dynamic web pages. To enhance the ability of Insert a graphic within a web page. To improve the skills to Create, validate and publish a web page.

Specify Program Outcome:

Be able to use HTML programming

Signature of Teacher

Khairajani S.U.

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College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Kandi S.J. **Department:** Computer Science

Program: MSc FY **Subject**: Computer Science

Course Code: SCMPSC-451

Paper Title: Mobile Application Development with kotlin.

Unit Number	Unit Name	Topics	Unit-wise Outcome
1	Introduction to Kotlin and Its Features:	Introduction to Kotlin and Its Features, Program Structure, Variables, Data Types, Type Conversion, Operators, Input /Output, Control Statements, When Expression, Looping Statements, Break, Continue and Return Enum, Nullable Non Nullable Types, Smart cast, Unsafe and Safe Cast, Elvis Operator	Understanding Kotlin Concept
2	Functions, Array, String and Object Oriented Programming	Functions, Recursion, Default and Named Arguments, Arrays, String, Object Oriented Concepts Classes and Objects, Constructor, Visibility Modifiers, Inheritance, Abstract Class, Interface, Data Classes, Basic Lambdas, Inline Functions.	Learning Functional Programming Concept

3	Exception Handling and Collections Framework	Exception Handling. ,Try Catch, Multiple Try BlockFinally, BlockKotlin ,Throw Keyword Collections, List -> ArrayList, Vector, LinkedList,Set -> HashSet, Map -> Hash Map.	Understand how handle the exception
4	Introduction to Android Programming	Android Its Features, API Levels and Versions, Android Architecture ,JVM, DVM, ART, DEX,Creating First Android Application, Android Project Structure,AndroidManifest.XM,Activity and Activity Life Cycle.	Understand Activity Lifecycle
5	User Interface Design	Linear Layout, Relative Layout, ContraintLayout, Text View, Edit Text, Button, Switch, Radio Button, and RadioGroup Views, Progress Bar View, Checkbox, Image View, Spinner and Adapter, Time Picker View, Date Picker View, Web View, Toast, ScollView, CardView, List View Custom List View and Recycler View.	Learning How to desing user interfaces using views, layouts and widgets.
6	Intents, Fragments, Dialog, Menus, and Storage Media	Implicit Intent, Explicit Intents, Fragments (Navigation Drawer),Alert Dialog, Custom Dialog, Menus, Shared Preferences, Internal Storage, SQLite Database, Notifications, Publishing to the Android Market.	Learn to easy access to store data and secure and reliable data storage.

Specify Course Outcome: By the end of the course, student will be able to write simple GUI applications, use built-in widgets and components, work with the database to store data locally, and much more.

Specify Program Outcome: Android Application Development course is designed to quickly get you up to speed with writing apps for Android devices. The student will learn the basics of Android platform and get to understand the application lifecycle

Signature of Teacher:

Kandi S.J

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College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Surnar.S.B. **Department:** Computer science

Program: MSc FY **Subject**: computer science

Course Code: SCMPSC-452 **Title:** Cloud computing

Unit Number	Unit Name	Topics	Unit-wise Outcome
UNIT I	INTRODUCTION AND CLOUD APPLICATION DEVELOPMENT	Introduction: Definition, Characteristics, Benefits, challenges of cloud computing, cloud models: service IaaS(infrastructure as service),PaaS (platform as a service),SaaS(software as a service), deployment models-public, private, hybrid, community; Types of cloud computing: Grid computing utility computing, cluster; computing Cloud services: Amazon, Google, Azure, online services, open source private clouds, SLA; Applications of cloud computing: Healthcare, energy systems, transportation, manufacturing, education, government, mobile communication, application development	Easily scale resources up or down according to business needs. Software updates and security patches are handled by the service provider.

UNIT II	CLOUD ARCHITECTURE, PROGRAMMING MODEL	Cloud Architecture, programming model: NIST reference architecture, architectural styles of cloud applications, single, multi, hybrid cloud site, redundant, non-redundant, 3 tier, multi-tier architectures; Programming model: Compute and data intensive.	The person or organization that uses cloud services. An independent entity that evaluates cloud services, performance, and security.
UNIT III	CLOUD RESOURCE VIRTUALIZATION	Cloud resource virtualization: Basics of virtualization, types of virtualization techniques, merits and demerits of virtualization, Full vs Para - virtualization, virtual machine monitor/hypervisor. 2 Page Virtual machine basics, taxonomy of virtual machines, process vs system virtual machines	Provides users with virtual desktops that can be accessed from various devices. This includes Virtual Desktop Infrastructure (VDI) solutions. • Aggregates multiple storage devices into a single storage pool, simplifying management and improving performance.
UNIT IV	CLOUD RESOURCE MANAGEMENT AND SCHEDULING	Cloud Resource Management and Scheduling: Policies and mechanisms for resource management, resource bundling, combinatorial, fair queuing, start time fair queuing, borrowed virtual time, cloud scheduling subject to deadlines, scheduling map reduce applications subject to deadlines, resource management and application scaling	Each task is scheduled based on its start time, ensuring that tasks that start earlier have a fair share of resources. Allocates resources based on predefined weights assigned to different tasks, allowing prioritization.

UNIT V	CLOUD SECURITY	Cloud Security: Risks, privacy and privacy impacts assessments; Multi-tenancy issues, security in VM, OS, virtualization system security issues and vulnerabilities; Virtualization system-specific attacks: Technologies for virtualization-based security enhancement, legal.	Unauthorized access to sensitive data can lead to significant financial and reputational damage. Compromised user credentials can allow attackers to gain unauthorized access to cloud resources.
UNIT VI	AWS Platform	Introduction to AWS Elastic computing, Introduction to the AWS products, Regions and Availability Zones, Signing up for AWS, AWS Free usage tier, Introduction AWS management console, Understanding AMI, Launching your first AWS instance, On-demand Instance pricing Reserved Instance pricing, Spot instance pricing, Setting up security, Security groups, Choosing & Creating a new AMI, Public and Private IP's	Geographical locations where AWS has data centers. Each region is isolated from others to ensure data sovereignty and compliance.

Specify Course Outcome: 1. After successful completion of this course, student will be able to Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.

2. Apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost.

3. Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.

Specify Program Outcome:1.To provide students with the fundamentals and essentials of Cloud Computing.

2. To provide students a sound foundation of the Cloud Computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios.

3. To enable students exploring some important cloud computing driven commercial systems and applications.

Signature of Teacher

Surnar S.B.

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Waghmare v.p **Department:** Computer Science

Program: MSC FY **Subject**: Computer Science

Course Code: SCMPSC-453

Paper Title: NoSQL with MongoDB

Unit Number	Unit Name	Topics	Unit-wise Outcome
UNIT I	Introduction to NoSQL	Why NoSQL? The Value of Relational Databases, Getting at Persistent Data, Concurrency, Integration, A (Mostly) Standard Model, Impedance Mismatch, Application and Integration Databases, Attack of the Clusters, The Emergence of NoSQL, Aggregate Data Models; Aggregates, Example of Relations and Aggregates, Consequences of Aggregate Orientation, Key-Value and Document Data Models, Column-Family	Students learn why NoSQL, understand ,

		Stores, Summarizing Aggregate Oriented Databases. More Details on Data Models; Relationships, Graph Databases, Schema less Databases, Materialized Views, Modeling for Data Access,	
UNIT II	Models of NoSQL	Distribution Models; Single Server, Sharding, Master-Slave Replication, Peer-to-Peer Replication, Combining Sharding and Replication. Consistency, Update Consistency, Read Consistency, Relaxing Consistency, The CAP Theorem, Relaxing Durability, Quorums. Version Stamps, Business and System Transactions, Version Stamps on Multiple Nodes	Understand the advantages and limitations of a single-server database model, including performance and scalability challenges. Describe how version stamps can be implemented on multiple nodes in a distributed system to facilitate consistency and conflict resolution.
UNIT III	Map Reduce and Partitioning	Map-Reduce, Basic Map-Reduce, Partitioning and Combining, Composing Map-Reduce Calculations, A Two Stage Map-Reduce Example, Incremental Map-Reduce Key-Value Databases, What Is a Key-Value Store, Key-Value Store Features,	• Understand the fundamental concepts of the Map-Reduce programming model, including the roles of the Map and Reduce functions in

		Consistency, Transactions, Query Features, Structure of Data, Scaling, Suitable Use Cases, Storing Session Information, User Profiles, Preference, Shopping Cart Data, When Not to Use, Relationships among Data, Multiportion Transactions, Query by Data, Operations by Sets	processing large datasets.
UNIT IV	Document Data base	Document Databases, What Is a Document Database?, Features, Consistency, Transactions, Availability, Query Features, Scaling, Suitable Use Cases, Event Logging, Content Management Systems, Blogging Platforms, Web Analytics or Real-Time Analytics, Ecommerce Applications, When Not to Use, Complex Transactions Spanning Different Operations, Queries against Varying Aggregate Structure	Understand the fundamental definition of a document database as a type of NoSQL database that stores data in documents (usually JSON or BSON format). Understand how document databases handle transactions, including support for atomic operations and multi-document transactions
UNIT V	Graph Databases	Graph Databases, What Is a Graph Database?, Features, Consistency, Transactions, Availability, Query	Understand the fundamental definition of a graph database as a NoSQL database that uses graph structures

		Features, Scaling, Suitable Use Cases, Connected Data, Routing, Dispatch, and Location-Based Services, Recommendation Engines, When Not to Use	(nodes, edges, and properties) to represent and store data.
UNIT VI	Example Databases	Apache HBASE, Apache Cassandra, MongoDB, Riak, Neo4J	Describe the properties of Neo4j as a graph database and its use of nodes, relationships, and properties to represent data.

Specify Course Outcome: Upon completion of this course, learners should be able to:
1. Define, compare and use the four types of NoSQL Databases (Document oriented, Key Value Pairs, Column-oriented and Graph).
2. Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Column-oriented NoSQL databases.
3. Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.
4. Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Key-Value Pair NoSQL databases.
5. Explain the detailed architecture, define objects, load data, query data and performance tune Graph NoSQL databases.
6. Evaluate NoSQL database development tools and programming languages.
7. Perform hands-on NoSQL database lab assignments that will allow students to use the four NoSQL database types via products such as Cassandra, Hadoop Hbase, MongoDB, Neo4J and Riak.

Specify Program Outcome:. This course will enable students to:
1. Define, compare and use the four types of NoSQL Databases (Document-oriented, Key Value Pairs, Column-oriented and Graph).
2. Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Column-oriented NoSQL databases.
3. Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.

Signature of Teacher:

Waghmare v.p.

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Kandi S.J. **Department:** Computer Science

Program: MSC FY **Subject**: **Computer Science**

Course Code: SCMPSCP-451 **Paper Title: Kotlin (Lab)**

Sr. No	Programs	Pro Outcomes
1.	Introduction to kotlin and its Features.	Student will be able to write simple GUI applications.
2.	Explain the structure of kotlin program.	
3.	Write a program for Elvis operator in kotlin.	
4.	Write a program for recursion in kotlin.	
5.	Write a program for Array.	
6.	Explain Android and its features.	
7.	Explain Checkbox and Radio Button.	
8.	Explain progress bar view.	
9.	Write a program for implicit and explicit intent.	
10.	Explain alert dialog.	
11.	Write a program for List View.	
12.	Write a program for database connectivity.	

Specify Course Outcome: 1) Declare and use variables understand datatypes
2) Define and call functions, understand function parameters and classes, create objects, understand inheritance.

Specify Program Outcome:
Understand the basic syntax and structure of Kotlin, including variables, data types, and control flow statements.

Signature of Teacher:

Kandi S.J.

Dnyanopasak Shikshan Mandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Kadam V.V **Department:** Computer Science

Program: M.Sc. FY **Subject**: Computer Science

Course Code: SCMPSCP-452

Paper Title: Lab (Cloud Computing)

Sr. No	Programs	Pro Outcomes
1.	Introduction to cloud computing	Understand the basic of cloud computing and Understand AWS services and features
2.	Install a computer in the virtual machine	
3.	Amazon web services	
4.	Google cloud platform	
5.	Cloud security	
6.	Cloud-native application	
7.	Cloud storage	
8.	Cloud infrastructure	
9.	Set up a load balancer in AWS	
10.	Implement IAM policies and roles in AWS	
11.	Configure network security groups in Azure	
12.	Launch a google cloud platform compute engine instances	
13.	Implement data life cycle management in google cloud storage	

14.	Implement network access controls in AWS.	
15.	Set up firewall google cloud	

Specify Course Outcome: configure various virtualization tools such as virtual box, VMware workstation.

- Design and deploy a web application in PaaS environment.
- Learn how to simulate a cloud environment to implement new schedulers.
- Install and use a generic cloud environment that can be used as private cloud.

Specify Program Outcome: Be expose to tool kits for grid and cloud environment

- To learn the design and development process involved increasing a cloud best application
- To develop web application in cloud

Signature of Teacher

Kadam V.V

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Muley S.M**.** **Department:** Comp. Science

Program: MSC FY **Subject**: comp Science

Course Code: SCMPSCP-453 **Paper Title:** Lab (NoSQL)

Sr. No	Programs	Pro Outcomes
1.	Introduction to NoSQL Databases	Understand the basics of NoSQL databases And Install and configure a NoSQL database (MongoDB)
2.	What are the features of NOSQL	
3.	Explain the difference between NOSQL vs Relational database	
4.	How does NOSQL DB budget memory	
5.	Explain [polyglot persistence in NOSQL	
6.	How to script NOSQL DB configuration	
7.	Does NOSQL database interact with oracle database	
8.	What is difference between NOSQL and MySQL DBs	
9.	Explain oracle NOSQL database	
10.	Compare NOSQL and RDBMS	
11.	NoSQL Performance Optimization	

12.	Integrating NoSQL with Application	
13.	Data Modeling in NoSQL	
14.	NoSQL Data Security	
15.	NoSQL Data Retrieval	

Specify Course Outcome: Attain a thorough grasp of NoSQL databases, covering principles, CAP theorem insights, and diverse database features.-Develop skills to make informed choices by exploring real-world use cases, understanding factors influencing database selection, and conducting comparative analyses.-Apply theoretical knowledge practically, ensuring students can implement NoSQL concepts and make effective decisions in various project scenarios

Specify Program Outcome: To provide students with a comprehensive understanding of NoSQL databases, their underlying principles, and the various types available. It focuses on the fundamental CAP theorem in distributed systems and delves into the unique characteristics of various NoSQL databases. Ultimately,
the practical aims to empower students to make informed decisions in selecting a database solutionalig ned with specific project needs.

Signature of Teacher

Muley S.M.

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Thite S.M **Department:** Comp. Science

Program: MSC FY **Subject**: comp Science

Course Code: SCMPSE-451 **Paper Title:** Php & MySQL

Unit Number	Unit Name	Topics	Unit-wise Outcome
1	Introduction to PHP	. Introduction to PHP , History and Features of PHP, Installation & Configuration of PHP, Embedding PHP code in Your Web Pages ,Sending Data to the Web Browser, Data types in PHP, Keywords in PHP, Using Variables, Constants in PHP ,Expressions in PHP, Operators in PHP.	To introduce the importance of PHP in web page design.•
2	. Programming with PHP	Conditional statements: if, if-else, switch, The? Operator Looping statements: while Loop, do...while Loop, for Loop, Arrays in PHP: Introduction- What is Array? Types of Arrays: Using Array Functions, Including and Requiring Files- use of	Learn basic php syntax,including variables and operators,

		Include () and Require (), Implicit and Explicit Casting in PHP.	
3	Using Functions, Forms in PHP	User define Functions in PHP, Strings in PHP: String Functions, Creating HTML Form, Handling HTML Form data in PHP.	To understand the features like functions, forms in PHP
4	Using OOPs Concept	What is Class & Object? Creating and accessing a Class & Object, Object properties, and object methods, Function Overloading, Constructor and Destructor, inheritances.	To understand OOPs concepts
5	Database Handling Using PHP with MySQL	Introduction to MySQL: Database terms, Data Types, Accessing MySQL –Using MySQL Client and Using phpMyAdmin, MySQL Commands, Using PHP with MySQL: PHP MySQL Functions, connecting to MySQL and Selecting the Database, Executing Simple Queries, Retrieving Query Results, Counting Returned Records, and Updating Records with PHP.	Learn how to develop database connectivity using MYSQL, and how to manage data using MYSQL.
6	Web Application Security	Using Cookies, Using Sessions, Sessions and Cookies, Improving Session Security, Form Validation, Handling HTML, Validating Data by Type, Form Validation with JavaScript.	To understand Cookies, Sessions

Specify Course Outcome• Able to design dynamic and interactive web pages, websites.
- Able to run PHP scripts on server and retrieve results.
- Able to handle databases like MySQL using PHP in web sites.

Specify Program Outcome:• Learn Core-PHP, Server Side Scripting Language.
- Learn to design dynamic and interactive Web pages.
- Learn PHP-Database handling.

Signature of Teacher
Thite S.M

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Ambhure D.P. **Department:** Comp. Sci

Program: MSC FY **Subject**: comp Science

Course Code: SCMPSE-451 **Paper Title:** Lab (Php & MySQL)

Sr. No	Programs	Pro Outcomes
1.	Create a php webpage and print "hello world"	Design an interactive webpage with graphical techniques. And Create a database in MYSQL and to manipulate data into it.
2.	Create a php program to find odd or even number from given number.	
3.	Write a PHP Program for associative array	
4.	Write a PHP Program for String handling	
5.	Write a PHP Program to use various Functions of PHP	
6.	Write a PHP Program to read form data	
7.	Write a PHP Program to implement Inheritance.	
8.	Write a PHP Program to implement Overloading and overriding	
9.	Write a PHP Program for File handling.	
10.	Develop PHP Program to Create a Database and to Insert and Delete data	
11.	Write a PHP Program to implement cookies	

12.	Write a PHP Program for Drawing images on a web page	
13.	Write a PHP program to swap two numbers.	
14.	Write a PHP Program to demonstrate the variable function	
15.	Write a PHP program that demonstrate form element (input elements).	

Specify Course Outcome: Able to handle array and string handling methods.
Implement OOPs Concepts in an application.

- Create a database in MYSQL and to manipulate data into it.
- Able to store information about client's session using Cookies
- Design an interactive webpage with graphical techniques.

Specify Program Outcome: To understand various methods to handle string and array

- To be aware of the OOPs concepts in PHP
- To know the file handling techniques.
- To create database and to manipulate data.
- To be familiar with the graphics methods of PHP

Signature of Teacher

Ambhure D.P

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Muley S.M. **Department:** Computer Science

Program: MSc - SY **Subject**: Computer Science

Course Code: CS – 301

Paper Title: Advance Database Administration

Unit Number	Unit Name	Topics	Unit-wise Outcome
UNIT – I	**Database Architecture**	Overview of database, pfile, spfile, Instance, Tablespaces, Datafiles, Other files, Oracle managed Files, Users, Schemas, Indexes, View, Sequences, Synonyms, Privileges, Roles, Clusters, Hash Clusters, Internal memory structure, SGA, PGA ,Background processes, External structure, Redo logs, Control files, Trace files, Alert logs, Creating database manually	Understanding Architecture of Oracles
UNIT – II	**Hardware configuration and consideration**	Architectural overview, Standalone hosts, Standalone hosts with disk array, Standalone, Hosts with disk shadowing, Multiple databases, Networked hosts, Networks of databases, Remote updates, Remote application options,	Implementation of Oracle database

		Real application, Clusters, Multiple processors, The parallel query and parallel load options, Client/server databases application, Standby databases	
UNIT – III	**Physical Databases Layouts**	Database file layouts, I/O connections among data files, I/O bottlenecks among all data files, Concurrent I/O among background processes, Defining recoverability and performance goals for the system, Defining the system hardware and mirroring architecture, Database space using overview, Implementation of the storage clause, Locally managed Tablespaces, Dictionary managed Tablespaces, Table segments, Index segments, Rollback segments, Temporary, Free space, Resizing Datafiles, Control files, Online redo log Files Deallocate space from segments, Shrinking Datafiles, Shrinking Tables, Clusters and indexes, Oracle managed files(OFA)	Understand and implement Physical database**.**
UNIT - IV	**Logical Database Layouts**	Describe logical structure of a database, Different types of Tablespaces, Changing the Tablespaces size, Allocating segments for temporary segments, Temporary segments in permanents Tablespaces, Changing tablespace status, changing tablespace storage settings, Oracle Managed Files (OMFs), Oracle Flexible Architecture (OFA), Different segments types and	Understand and implement Logical Database.

		relationships, Extent usages, Block space utilization	
UNIT – V	**Backup – Recovery & Networked ORACLE**	Types of Logical and Physical backups, Implementations , Integrations of backup procedures, NOARCHIVELOG Mode, ARCHIVELOG Mode, Backup Methods –Closed Database Backup, Open Database Backup, Recovery in NOARCHIVELOG Mode, Recovery in ARCHIVELOG Mode, Recovery manager architecture, Recovery Manager Features, Using Recovery manager & RMAN, Using OEM backup manager, Generating lists and reports. Networked Oracle - Overview of SQL *Net and Net8 , Connect descriptors, Service names and Listeners, Net8 assistants, The multi-protocol interchange, Dedicated Server Processes, Oracle Shared Server, Benefits of Oracle Shared Server, Client Server application, Database links.	Secure database using backup and recovery.
UNIT – VI	**Database Security, Auditing and Database Tuning**	Security capabilities-Account security, Object privileges, System level roles and privileges, Implementing security-operating system security, Create user, Drop user, User profiles, and Password managements, Preventing password reuse, setting password complexity, Using password file for authentication, Auditing, Login audits, Action audits, Object audits, Protecting the audit	Improve Performance tuning of oracle database.

		trail. Tuning Databases -Tuning application design, Tuning SQL,Memory usage, Data storage, Data manipulation, Physical storage, Logical storage, reducing net traffic using OEM	

Specify Course Outcome: Students can be administration oracle database using this course.

Specify Program Outcome: Students are able to Implementation of software

Signature of Teacher

Muley S.M.

Dnyanopasak Shikshan Mandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Ambhure D.P. **Department:** Computer Science

Program: M.Sc. SY **Subject**: Computer Science

Course Code: CS-302 **Paper Title:** Web Technologies

Unit Number	Unit Name	Topics	Unit-wise Outcome
I	Introduction	Web Technology & XML Internet – current state, hardware and software requirement, ISP, an internet account, web home page, URL, browser, security on web, searching tools, search engines, FTP, Gopher, Telnet, emails, TFTP Web browser architecture, web page and multimedia, static dynamic and active web page, simple mail transfer protocol, simple network management protocol, hypertext transfer protocol	To understand the concept of internet, search engines and protocols.
II	Basics of PHP	Introduction to PHP, what does PHP do? History of PHP, language basics, datatypes,	Learn the concept of php language

		variables, expressions and operators, flow control statements, including code, embedding PHP in web pages.	
III	Functions & Strings	Calling a function, defining a function, variable scope, function parameters, return values, variable functions, and anonymous functions. Strings: Accessing individual characters, cleaning strings, encoding and escaping, comparing strings, manipulating and searching strings, regular expressions.	To understand the functions and procedure
IV	Arrays & Objects	Indexed vs. associative arrays, identifying elements of an array, storing data in arrays, multidimensional arrays, extracting multiple values, converting between arrays and variables, traversing arrays, sorting. Objects: Creating an object, accessing properties and methods, declaring a class, introspection	Utilize the basics concept of statements and array
V	MySQL Overview	Introduction, connecting to and disconnecting from the server , Entering queries , Creating and using a database , Creating and selecting a database , creating a table , loading data into a table , Retrieving information from a table , selecting all data , selecting particular rows , selecting particular columns , sorting rows , date calculations , working with NULL values , pattern matching , counting rows , using more than one tables. MySQL databases in PHP:	Understand the MYSQL Database concept and queries.

Specify Course Outcome: Students will be Students are able to develop a dynamic webpage by the use of PHP and java script. On completion of this course, a student will be able to develop a web application using PHP and java script.

Specify Program Outcome: To aware the Students with advanced web technology to develop a skill to write applications using PHP and Java Script

Signature of Teacher

Ambhure D.P

Dnyanopasak Shikshan Mandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Khairjani S.U. **Department:** Computer Science

Program: M.Sc. SY **Subject**: Computer Science

Course CodeCS-303 **Paper Title:** Data Mining & Data Warehousing

Unit Number	Unit Name	Topics	Unit-wise Outcome
I	**Introduction**	Basic Data Mining task, Data Mining Vs Knowledge discovery in databases, Data mining metrics, Social Implication of Data Mining	Basic concept of data mining task
II	**Related Concepts and Data Mining Techniques**	Database/OLTP systems, Information Retrieval, Decision Support Systems, Dimensional Modeling, OLAP, Web Search Engines, Statistical perspective on Data Mining, Decision Tree, Neural networks	Classify the techniques of data mining
III	**Classification**	Introduction, Statistical based algorithms, Distance based algorithms, Decision tree	Classification of algorithm in the data mining

		based algorithms, Neural network based algorithm.	
IV	**Clustering and Association Rules**	Introduction, Hierarchical algorithms, Partitioned algorithms, Clustering large databases, Basic algorithms, Parallel and distributed algorithms	Describe the clustering and association rules
V	**Web Mining**	Introduction, Web content mining, Web structure mining, Web usage mining.	Introduction to web mining
VI	**Data Warehousing**	Data Warehousing – the only viable solution, Data Warehouse defined	Understanding the data warehousing

Specify Course Outcome: Students will be Understand Data Warehouse fundamentals, Data Mining Principles. Identify appropriate data mining algorithms to solve real world problems

Specify Program Outcome: To identify the scope and essentiality of Data Warehousing and Mining. To analyze data, choose relevant models and algorithms for respective applications.

Signature of Teacher

Khirajani S.U.

Dnyanopasak Shikshan Mandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Thite S.M

Department: Comp. Science

Program: MSC SY

Subject: Computer Science

Course Code: CS-304C

Paper Title: Research Methodology

Unit Number	Unit Name	Topics	Unit-wise Outcome
1	Introduction, the Purpose and Product of Research	What is research? Evaluating Research, the 6Ps of research, Reasons for doing Research, possible products, Finding and choosing research topics, evaluating the purpose and product of research.	. Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.
2	Overview of the Research Process, Internet Research	A model of the research process, Alternative models of the research process, evaluating the research process, Background of the Internet and WWW, Internet research topics, The Internet and a literature review, The Internet and research strategies and methods, Internet research, the law and ethics	Evaluate different models for research by using internet.
3	Reviewing the literature, Surveys and Design Creation	Purpose of literature review, literature resources, The Internet and literature reviews, conducting	Evaluation of literature, surveys for research

		literature reviews, evaluating literature reviews, Define Surveys, Planning and Designing surveys, the internet and surveys, Example of Surveys, defining design and creation, Planning and conducting design and creation research, Creative computing and digital art.	
4	Experiments, Case studies, Action Research	Defining experiments, Planning and conducting experiments, the internet and experiments, defining case studies, Planning and conducting case studies, the internet case studies, Defining Action research, Planning and conducting Action research, The internet and Action research	Case studies used for improvement of research work.
5	Interviews, Observations, Questionnaires	Defining Interviews, Planning and conducting Interviews, Group Interviews Internet based Interviews, Defining Observations, Planning and conducting systematic Observations, Planning and conducting participant Observations, The internet and Observations. Introduction to Quantitative data analysis, Qualitative data analysis and Presentation of Research	Evaluation of interview for research

Specify Course Outcome: Students will be demonstrate knowledge of research processes (reading, evaluating, and developing), Perform literature reviews using print and online databases.

Specify Program Outcome: To introduce research and research methodologies in CS to students going to peruse research in CS. To understand the strengths and weakness of each of different research methods.

Signature of Teacher

Thite S.M

Dnyanopasak Shikshan Mandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Muley S.M **Department: Comp. Science**

Program: M.Sc. SY **Subject**: Computer Science

Course Code: CS-305

Paper Title: Computer laboratory 1(Adv. Database Administration)

No.	Program	Unit-wise Outcome
1	Overview of Database	Differentiate between PFILE (parameter file) and SPFILE (server parameter file) and explain their roles in database configuration. Describe the concept of tablespaces and their importance in organizing data within a database.
2	Write a program PFILE and SPFILE	
3	Create a new user and schema.	
4	Create an index on a table	
5	Create a view based on a query.	
6	Create a sequence for generating unique values	
7	Create a role and grant it privileges	
8	Set up a standalone database on a single host.	
9	Configure a database on a standalone host using a disk array.	
10	Set up multiple databases on a single host.	
11	Document the layout of database files for an Oracle database.	
12	Analyze the I/O connections and paths between data files.	
13	Design a hardware architecture that supports mirroring for redundancy.	
14	Create a document or diagram explaining the logical	

	structure of a database.	
15	Alter the size of an existing tablespace.	

Specify Course Outcome: Analyze images in the frequency domain using various transforms. Interpret image segmentation and representation techniques.

Specify Program Outcome: Evaluate the techniques for image enhancement and image restoration.

Signature of Teacher

Muley S.M

Dnyanopasak Shikshan Mandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Ambhure D.P **Department:** Computer Science

Program: M.Sc. SY **Subject**: computer science

Course Code: CS-306 **Paper Title:** Lab (Web technologies**)**

No.	Program	Unit-wise Outcome
1.	Write a program in PHP to demonstrate looping statements in PHP.	Able to handle array and string handling methods. Implement OOPs Concepts in an application. Create a database in MYSQL and to manipulate data into it. Design an interactive webpage with graphical techniques.
2.	Write a program in PHP to demonstrate conditional statements in PHP.	
3.	Write a program in PHP to Create an Array, Insert elements in Array, Accessing elements from Array and Displaying elements of Arrays.	
4.	Write a program in PHP to demonstrate including multiple files in PHP webpage.	
5.	Write a program in PHP for Creating and Calling your own functions	
6.	Write a program in PHP to declare a class, creating an object, demonstrates writing methods and declaring properties, accessing objects.	
7.	Write a program in PHP to demonstrate String Functions	

8.	Write a program in PHP to create/design a User Registration Form, validate form data and display entered form data on webpage	
9.	Use MySQL in command line mode for following operations	
10.	Write a program in PHP to connect to MySQL, and selecting the database, executing simple queries, and retrieving query results.	
11.	Write a PHP Program for File handling.	
12.	Write a PHP Program to read the employee details	
13.	Write a PHP program to prepare the student marks list.	
14.	Write a PHP program that demonstrate form element (input elements).	
15.	Write a PHP program that demonstrate passing variable using URL.	

Specify Course Outcome: Able to handle array and string handling methods. Implement OOPs Concepts in an application. Create a database in MYSQL and to manipulate data into it. Design active webpage with graphical techniques.

Specify Program Outcome: To understand various methods to handle string and array. To be aware of the OOPs concepts in PHP. To know the file handling techniques. To create database and to manipulate data. To be familiar with the graphics methods of PHP

Signature of Teacher

Ambhure D.P

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Patode S.S. **Department:** Comp. sci

Program: MSC SY **Subject**: Comp. Science
Course Code: CS-307B **Paper Title:** Cyber security

Unit Number	Unit Name	Topics	Unit-wise Outcome
1	Unit I	Why Learn About Cyber Crime. Introduction to Cyber Crime. Types of Cyber Crime.	Discuss and analyses cybercrime
2	Unit II	Hacking passwords of MS-Office Files & Email for ethical use. Sending Fake Emails/SMS. Email Tracing.	Describe the email tracking method. And implement email encryption standards(MS-office 365)
3	Unit III	Chatting In LAN/ Transferring Files in LAN. Sharing Desktop. Preventing Credit/Debit card Fraud. Screen Recording.	Learning the Transferring Files in LAN. Sharing Desktop. Preventing Credit/Debit card Fraud
4	Unit IV	Introduction to Cyber Security. Online Safety Tips. Protecting Password.	Understand the cyber security
5	Unit V	Stenography/Hiding Information. Encrypting Decrypting Information. Identifying secure websites, Introduction to Cyber Laws.	To understand key terms and concepts in cyber law, intellectual property

Specify Course Outcome: Students will understand principles of web security. Students will understand key terms and concepts in cyber law, intellectual property and cybercrimes, trademarks and domain theft.

Specify Program Outcome: To get knowledge about securing both clean and corrupted systems, protect personal data, and secure computer networks. To understand key terms and concepts in cyber law, intellectual

Signature of Teacher

Patode S.S

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Patode S.S **Department:** Comp. sciences

Program: MSC SY **Subject**: Comp. Sci

Course Code: CS-308 **Paper Title:** SK-03 Seminar presentation activity

Guidelines for Seminar Presentation Activity

1. Each student has to give seminar individually

2. The topic should be Unique for each student

3. Students must approve seminar topic from seminar in charge faculty.

4. Student must prepare at least Ten Power point slides seminar presentation.

5. Students have to give at least two seminars on the selected topic throughout the semester

Specify Course Outcome: Help the student increase self-motivation, personal responsibility, and understanding of his or her role in being an informed participant in the educational process. Create an environment that helps the student establish healthy relationships and support networks.

Specify Program Outcome: To help the student increase self-motivation, personal responsibility, and understanding of his or her role in being an informed participant in the educational process. To develop a Stage Courage for putting his concepts strongly in front of the audience.

Signature of Teacher

Patode S.S

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: muley S.M. **Department:** Comp. science

Program: MSC SY **Subject**: Comp. Sci

Course Code: CS-401 **Paper Title:** Digital image processing

Unit Number	Unit Name	Topics	Unit-wise Outcome
1	Digital Image Processing Systems	What is DIP? Fundamental steps in DIP, Components of an Image Processing System, Elements of Visual Perception, Lights and Electromagnetic Spectrum, Image sensing and acquisition, Image sampling and quantization	Understand the fundamental concepts of a digital image processing system
2	Introduction to Digital Image Representation	Digital Image Representation, Read & Displaying Images, Data Classes & Image types, Converting between Data Classes and Image types	Learn representation of digital image and image types
3	Intensity transformation &Spatial filtering	Intensity Transformation function, Histogram processing & Function plotting, Spatial filtering	Understand Intensity transformation &Spatial filtering
4	Frequency Domain Processing	2D –discrete Fourier transform, Filtering in frequency domain, Obtaining Frequency Domain Filters from spatial filters	Utilize 2D –discrete Fourier transform and Frequency Domain Processing
5	Image Restoration	A Model of the Image Degradation /Restoration Process, Noise Models, Restoration in presence of Noise only – spatial filtering, Periodic Noise Reduction by Frequency domain Filtering,	Correcting image degradation such as blurring or distortion caused by motion of atmospheric condition

		introduction Color Image Processing and Introduction to Wavelets	

Specify Course Outcome: Students will be Analyze images in the frequency domain using various transforms. Evaluate the techniques for image enhancement and image restoration and also categorize various compression techniques.

Specify Program Outcome: To study the image fundamentals and mathematical transforms necessary for image processing. To study the image enhancement, image restoration procedures and image compression techniques.

Signature of Teacher

Muley S.M

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Ambhure D.P. **Department:** Comp. science

Program: MSC SY **Subject**: Comp. Sci

Course Code: CS-402 **Paper Title:** Linux Administration

Unit Number	Unit Name	Topics	Unit-wise Outcome
1	Introduction to RED Hat LINUX	Hardware Requirements, Red Hat LINUX Installation, Advantages of LINUX, Other LINUX distributions, Concept of Linux loader	Learning of installation and configure Linux Distribution
2	Working with Linux	LINUX file system, Shells, Text editors, Changing User Information, File Permissions, Virtual Consoles	Understand the architecture of Linux, including kernel, shell, and filesystem structures.
3	The X Window System	Basic X window system, Configuring X window systems, Starting X, Selecting & using X window.	Learning system configuration
4	Managing Services, Software & System Resources	LINUX Boot Process, System services and run levels, controlling services at boot with administrative tools, Starting and stopping services manually, Using RPM for software management, Using RPM on the command line, extracting a single file from & RPM file, Graphical Package Management, System monitoring tools	Utilize package management tools to install, update, and remove software.
5	Printing with Linux	Configuring & managing print services, Local printer installation, Network printer	Understand basic networking concepts and tools, and

		installation, LINUX printing commands, Using the Common UNIX Printing System (CUPS), Console print control, Introduction to Network Connectivity Networking with TCP/IP	configure network settings in a Linux environment.

Specify Course Outcome: Students will be able carry the duties of a UNIX system administer. Students will learn to do file processing, process management, IO management, queues management, networking, storage backup, account management, proper system start-up and shutting down, as well as other tasks.

Specify Program Outcome: To describe the relationship between GNU and Linux to describe various operating system concepts such as multitasking, virtual memory and multiuser environments as they apply to Linux.

Signature of Teacher

Ambhure D.P

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Kandi S.J **Department:** Comp. sciences

Program: MSC SY **Subject**: Comp. Science

Course Code: CS-403 **Paper Title:** Major project Development Activity

Guidelines for Project Development:

1. A group of maximum three students should be formed at the beginning of the semester

2. Each project will be allotted one project guide.

3. Students must submit the project topic and synopsis to the project guide.

4. Students will be given a project approval letter signed by the head of department and the project guide.

5. After receiving a project approval letter, students must submit at least three progress reports of their development in project to the guide, one per month.

6. after completion of project students have to give pre-exam demo to his guide.

7. After finalization of the project, students must prepare minimum 03 copies of the project reports, out of which one copy is for the college and one copy is for the university records. University/College copy must be bind with black covering with golden embossment and it should contain

i. First Page

ii. Certificate

iii. Declaration

iv. Acknowledgement

v. Project Approval letter

vi. Three Progress reports

Vii. System Flow Diagram/DFD

viii. Chapter wise briefing, results, conclusions, snapshots, code, etc.

ix. Bibliography

Specify Course Outcome: Project based learning will increase their capacity and learning through shared cognition. Students will have an ability to identify, formulate and implement computing solutions. Students will be able to design a system, component or process as per needs and specification.

Specify Program Outcome: To provide a postgraduate level knowledge in computer science, including understanding, analysis, management, and handling of real-life information technology problems in workplace.

Signature of Teacher

Kandi S.J

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Agarmore J.R. **Department:** Comp. sciences

Program: MSC SY **Subject**: Comp. Sci

Course Code: CS-404A **Paper Title:** Client server technology

Unit Number	Unit Name	Topics	Unit-wise Outcome
1	Client/Server Computing	DBMS concept and architecture, Single system image, Client Server architecture, mainframe centric client server computing, downsizing and client server computing, preserving mainframe applications investment through porting, client server development tools, advantages of client server computing	Understand the DBMS concept and architecture and client server development tools,
2	Components of Client/Server application	The client: services, request for services, RPC, windows services, fax, print services, remote boot services, other remote services, Utility Services & Other Services, Dynamic Data Exchange (DDE), Object Linking and Embedding (OLE), Common Object Request Broker Architecture (CORBA). The server: Detailed server functionality, the network operating system, available platforms, the network operating system, available platform, the server operating system.	Understanding of various client services that enable interaction with servers, enhancing user experience and functionality in networked environments.
3	Client/Server Network	connectivity, communication interface technology, Interposes communication, wide area network technologies, network topologies (Token Ring, Ethernet, FDDI,	Understanding the various connectivity options available in network environments, enabling effective data

		CDDI) network management, Client-server system development: Software, Client–Server System Hardware: Network Acquisition, PC-level processing unit, Macintosh, notebooks, pen, UNIX workstation, x-terminals, server hardware.	transmission and network integration.
4	Client Server Systems Development	Services and Support, system administration, Availability, Reliability, Serviceability, Software Distribution, Performance, Network management, Help Disk, Remote Systems Management Security, LAN and Network Management issues. Training, Training advantages of GUI Application, System Administrator training, Database Administrator training, and End-user training.	Understanding the importance of comprehensive services and support in IT environments, ensuring user satisfaction and system efficiency. Awareness of common LAN and network management issues, including troubleshooting connectivity problems and optimizing network performance.
5	Data Storage	Magnetic disk, magnetic tape, CD-ROM, WORM, Optical disk, mirrored disk, fault tolerance, RAID, RAID-Disk network interface cards. Network protection devices, Power Protection Devices, UPS, Surge protectors. The future of client server Computing Enabling Technologies, The transformational system.	Understanding of magnetic disk technology, its usage in data storage, and its advantages in terms of speed and accessibility.

Specify Course Outcome: Gain Exposure on most common used servers. Understand the concept of client-server development and learn problem solving skills through design scenarios for network environment.

Specify Program Outcome: To understand the different components for developing client/server applications. To understand the enabling technologies for building Internet and Web database applications

Signature of Teacher
Agarmore J.R.

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Muley S.M. **Department:** Comp. sciences

Program: MSC SY **Subject**: Comp. Sci

Course Code: CS-405 **Paper Title:** Lab7 (DIP)

No.	Program	Unit-wise Outcome
1.	Program for create tablespace? And View Tablespace and Data file Information?	To study the image fundamentals and mathematical transforms necessary for image processing. To study the image enhancement techniques. To study image restoration procedures.
2.	Program for Add New Data file to Increase the Size of a Tablespace?	
3.	Program for Increase Size of an Existing Data file? And Showing Parameters of the Control files?	
4.	Program for String Function?	
5.	Program for order by clause?	
6.	Program for Numeric Function?	
7.	Program for Information about log file? And log file members?	
8.	Program for Some basic concepts in DIP using MATLAB?	
9.	Program for Data classes conversion in DIP using MATLAB?	

10.	Program for Converting the given image into Binary Image in DIP using MATLAB?	
11.	Program for Intensity Transformation by using imadjust function in DIP using MATLAB?	
12.	Program for Intensity transformation in truecolor images in DIP using MATLAB?	
13.	Program for Image type conversion (grayscale images) in DIP using MATLAB?	
14.	Program for image type conversion (indexed images) in DIP using MATLAB?	
15.	Program for Image type Conversion (Truecolor Images) in DIP using MATLAB?	

Specify Course Outcome: DIP encompasses various techniques for manipulating and enhancing digital image. Dip application are divorce, including imaging, remote sensing document processing.

Specify Program Outcome: understand the fundamental concept of digital image processing

- Knowledge of image enhancement restoration techniques
- Implement image processing algorithm using programming languages

Signature of Teacher

Muley S.M

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Kadam V.V**.** **Department:** Comp. science

Program: MSC SY **Subject**: Comp. Sci

Course Code: CS-408 **Paper Title:** Lab8 (Client server tech)

No.	Program	Unit-wise Outcome
1.	Explain client server architecture	*Define* the fundamentals of underlying principles of computer networking. *Create* socket and *analyze* different client server model.
2.	Explain client server development tools	
3.	What is RPC,Window service	
4.	What is OLE	
5.	Explain remote system management	
6.	Explain sever hardware	
7.	What is network IP	
8.	Client – server communication using rap	
9.	Arithmetic calculator using rpc-rmi	
10.	Simulation of sliding window protocols	
11.	Study of Different Type of LAN& Network Equipment	
12.	Program using tcp sockets date and time server	
13.	**E**xplain connect the computers in LAN	

14.	**E**xplain search protector	

Specify Course Outcome: Upon Completion of the course, the students will be able to 1. To get an idea of how the process executes in UNIX. 2. To know the concept of inter process communication. 3. To implement the network programming in UNIX. 4. To make a client server communication through TCP and UDP protocols. 5. To expose on advanced socket programming, domain name system, http in UNIX environment.

Specify Program Outcome: Analyze the different layers in networks. 2. Define, use, and differentiate such concepts as OSI-ISO, TCP/IP.

3. How to send bits from physical layer to data link layer
4. Sending frames from data link layer to Network layer
5. Different algorithms in Network layer

Signature of Teacher

Kadam V.V

DnyanopasakShikshanMandal's

College of Arts, Commerce and Science, Parbhani

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Surnar S.B

Department: Comp. sciences

Program: MSC SY

Subject: Comp. Sci

Course Code: CS-407B

Paper Title: Logical Reasoning and Quantitative Aptitude

Unit Number	Unit Name	Topics	Unit-wise Outcome
1	General Mental Ability-I	Series Completion, Coding and Decoding, Blood relations, Seating Arrangement, Comparison type questions.	Ability to identify patterns and complete series in numerical and alphabetical sequences, enhancing critical thinking and problem-solving skills.
2	General Mental Ability-II	Directions sense test, logical ven diagrams, Inserting the missing character, data sufficiency.	Ability to solve problems related to direction sense, including determining relative positions and distances, enhancing spatial reasoning and navigation skills.
3	Logical Deduction	Logic, statement arguments, statement assumptions, statement conclusion.	Understanding the fundamental principles of logic, including the importance of logical reasoning in problem-solving and decision-making.

4	Arithmetical Ability-I	Numbers, Simplification, Average, Problems on ages, Percentage, Probability	Ability to understand and manipulate different types of numbers (whole numbers, integers, fractions, decimals) and perform basic arithmetic operations.
5	Arithmetical Ability-II	Profit and loss, ratio and proportion, time and work, simple interest compound interest, calendar. Data Interpretation Tabulation, Bar graphs, Pie charts, line graphs	Ability to calculate profit, loss, and percentage changes in various financial scenarios, enhancing understanding of basic economic principles.

Specify Course Outcome: Understand the basic concepts of QUANTITATIVE ABILITY and LOGICAL REASONING Skills, acquire satisfactory competency in use of VERBAL REASONING and Solve campus placements aptitude papers covering Quantitative Ability, Logical Reasoning and Verbal Ability

Specify Program Outcome: To acquire the skill to solve the problems on Logical Reasoning To acquire the skill to solve the problems on Quantitative Aptitude

Signature of Teacher

Surnar S.B