

## List of Lab Objectives - Courses of Fall 2019-2020

Prescribed List of Practical					
<b>Name of Teacher</b>	Dr. Naeem Ahmed Mahoto				
<b>Course Name</b>	Programming Fundamentals	<b>Course Code</b>	SW 112		
<b>Batch</b>	19-SW	<b>Year</b>	1 <sup>st</sup>	<b>Semester</b>	1 <sup>st</sup>

S. No	Lab Hand-out Title	Lab Outcome
1	Installation of Turbo C++, Dev-C++ IDEs, Basic C++ Program structure and Programming syntax	To become familiar with basic programming constructs of C++. Compiling and execution of C++ programs.  To learn how to use Turbo C++ and Dev-C++ IDEs to create console-mode applications. Source code and Object code, Language Translators
2	C++ Primitive datatypes. Variables and constants.	To become familiar with C++ Primitive data types, such as int, char, float etc.  Variable declaration, definition and initialization. Variable names / Identifiers. Output with cout : single character and other data types. Input with cin: Single character, word and multiword.
3	To become familiar with operators in C++	To demonstrate the working of various operators such as Arithmetic, Relational, Logical and Bitwise operators.  To understand operator precedence.
4	Working with iterative structures	To understand Control Structures (Iterative statements/Loops) such as for, while, and do-while loop.
5	Working with conditional structures	To know how to compare the given data values. How to define the logical expressions. Writing code using if and switch statements.
6	To become familiar with User Defined Data Types (Structures and Enumeration)	Declaring, Defining and initializing structure.  Applications of structure datatype
7	To become familiar with Functions in C++	Functions and how to define and implement them in a program.
8	Implementation of arrays	Declaring, Defining and initializing the arrays.  To learn how to traverse arrays using loops.
9	To become familiar with Pointers	Learning C++ pointers, and pointer variables and how to define and use pointers in programs
10	Introduction to Object Oriented programming	To become familiar with OOP, Objects and Classes.
11	To become familiar with inheritance and Polymorphism	Implementing the concepts of inheritance and Polymorphism. Learning about (Method Overloading) and (Method Overriding)
12	To become familiar with	C++ String class and built-in methods of String class and their use for string

	Strings	manipulation
13	Operator overloading	To understand and implement operator overloading
14	To become familiar with Streams and Files	To Understand basic File I/O, and Streams. To understand the Hierarchy of classes to deal with Input and Output streams.
15	Case Study	Semester Project

Prescribed List of Practical					
Name of Teacher	Arsalan Aftab Memon				
Course Name	Introduction to Information and Communication Technologies	Course Code	<b><u>(SW-113)</u></b>		
Batch	19SW	Year	1 <sup>st</sup>	Semester	1 <sup>st</sup>

#	Lab Hand-out Title	Learning Outcome
1	Understanding your operating system and troubleshooting basic problems	
2	Efficiently using Internet and Search Engines	
3	Getting familiar with MS Word	--
4	Working with Advanced features of MS Word	
5	Technical Writing with MS Word	
6	Working with MS PowerPoint	
7	Enhancing presentations using animations and business models	
8	Getting familiar with MS Excel	
9	Working with formulae and functions in MS Excel	
10	Using a sophisticated text editor for programming	
11	Getting familiar with Git and GitHub	
12	Team Collaboration using a Remote Access Software	
13	Creating Google Forms	
14	Getting familiar with basic HTML Syntax	
15	Case Study	

<b>Prescribed List of Practical</b>
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<b>Name of Teacher</b>	Ms. Hira Noman				
<b>Course Name</b>	Database Systems		<b>Course Code</b>	SW215	
<b>Batch</b>	18-SW	<b>Year</b>	2 <sup>nd</sup>	<b>Semester</b>	3 <sup>rd</sup>

<b>S. No</b>	<b>Lab Hand-out Title</b>	<b>Learning Outcome</b>
1	Installation of ORACLE	To understand DBMS Types, Oracle versions & installation
2	To become familiar with Data Modeling	To learn details of ER modeling
3	To become familiar with Normalization	First second and third normal form with examples
4	To become familiar with Demoralization.	Applying Methods of DE normalization
5	To become familiar with Database Connectivity	JDBC
6	To become familiar with SQL Injections and Prepared Statements	Database Security
7	To become familiar with Joins	Joining Multiple Tables
8	To become familiar with Sub-Queries.	Single & Multiple row Subqueries
9	To become familiar with views and indexes.	Simple & Complex Views, Indexes
10	To Grant privileges to users and creating user accounts	Granting & revoking Access Rights
11	Introduction to PL/SQL, control structure and data types	PL/SQL Environment & Structure
12	To become familiar Cursors in PL/SQL	Implicit & Explicit Cursors
13	To become familiar with Exception Handling	Pre-defined & User Defined Exceptions
14	To become familiar with stored procedures and stored functions.	Creating Procedures and Functions
15	Project	Hands on the RDBMS

<b>Prescribed List of Practicals</b>	
<b>Name of Teacher</b>	Zubair Ahmed

Course Name	Software Construction and Development	Course Code	SW315		
Batch	17SW	Year	3 <sup>rd</sup>	Semester	5 <sup>th</sup>

#	Lab Hand-out Title	Learning Outcome
1	Exploring different software Development methodologies.	Learning for opting the best methodology depending on the nature of the problem.
2	Designing the Software behavior	Working with the class diagrams to conceptualize the working of Application
3	Designing the Software behavior.	Working with the sequence diagrams to understand the interaction within the system
4	Designing the software behavior.	Working with the object diagrams to understand a detailed state of the system at different instants.
5	Designing the Software behavior.	Working with the Activity diagrams to understand the dynamic behavior of the system
6	Requirement Elicitation, Analysis and Validation	Understanding rules of interviews, designing survey forms, techniques for removing inconsistencies and redundancies.
7	Development of SRS	Have and Have nots in SRS. Designing a standard template.
8	OOP Paradigm	Working with Software design patterns
9	Agile Framework	Implementation of Xtreme programming and Scrum
10	OOAD Optimization	Code Refactoring
11	Unit testing	Working with Junit by applying different techniques of unit Testing
12	Integration Testing	Working with VectorCast software for integration testing
13	Software deployment	Release Management process and working on Dev Server, Test Server, and PROD server.
14	Configuration Management	Configuration management process.
15	Case Study	Project

Prescribed List of Practicals	
Name of Teacher	Engr. Zulfiqar Dayo

<b>Course Name</b>	Multimedia Communication	<b>Course Code</b>	SW-416		
<b>Batch</b>	F-16SW	<b>Year</b>	Final	<b>Semester</b>	7 <sup>th</sup>

<b>S. No</b>	<b>Lab Hand-out Title</b>	<b>Learning Outcome</b>
1	Introduction to Adobe Photoshop and learn to edit images in Photoshop.	Learning different editing options in Photoshop
2	Applying different layer styles to design glossy candy text effect using Adobe Photoshop.	Learning Layers styles in Adobe Photoshop
3	Learn to design an awesome television icon from scratch using Adobe Photoshop.	Learning designing of icon using Adobe Photoshop
4	Learn to design academic posters using Adobe Photoshop	Learning posters designing using Adobe Photoshop
5	Perform animations in Adobe Photoshop	Learning Animations in Adobe Photoshop
6	Introduction to Audacity and learn to apply editing operations and special effects on sounds.	Becoming Familiar with sound editing operations in Audacity
7	Working with Text to speech converters	Exploring Text to speech converters online
8	Working with Hit films Express	Exploring Hit films express features.
9	To become familiar with special effects in Hit films Express and apply them	Get familiar about hit films using different features
10	Working with Google Sketch up	Becoming familiar with Google Sketch up options
11	To perform with frame by frame and tweening animation in flash	Learning simple Animations in Flash
12	To perform special effects in flash	learning effects in Flash
13	To perform with scripting in Flash.	Learning scripting
14	To perform character animation in Flash.	Learning different types of Animation in Flash
15	Details about your project consisting of software and particular tools used with comprehensive procedure.	Details about your project

#### Prescribed List of Practicals

<b>Name of Teacher</b>	Ms. Samita Bai
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<b>Course Name</b>	Web Engineering		<b>Course Code</b>	SW-417	
<b>Batch</b>	F-16SW	<b>Year</b>	Final	<b>Semester</b>	7 <sup>th</sup>

<b>S. No</b>	<b>Lab Hand-out Title</b>	<b>Learning Outcome</b>
1	To understand HTML basics for developing web applications	Learn HTML Basics, Lists, Images, Tables and Forms
2	To Become familiar with HTML5 semantic and multimedia elements	Learn HTML5 elements such as audio, video and new input types
3	To become familiar with JavaScript basics for user interaction	Learn event handling in JavaScript using DOM
4	To become familiar with CSS for styling web applications	Style websites using CSS
5	To become familiar with Bootstrap styling framework	Learn Bootstrap framework for website styling and design
6	To become familiar with PHP basics and installation of web server	Learn installation of XAMPP server, Basics of PHP program: variable, comments and operators
7	To become familiar with control structures and arrays in PHP	Learn to create programs with loops and arrays in PHP
8	To become familiar with functions and form handling and file handling in PHP	Learn to create programs with PHP functions, Handling form data using GET and POST
9	To become familiar with AJAX for data fetching	Learn Basic JQuery syntax and form handling using AJAX
10	To become familiar with sessions and cookie management in PHP	Learn to read, write and upload files to PHP server
11	To become familiar with database connectivity using PHP	Learn data storage management on the PHP server with sessions and cookies
12	To become familiar with web services using PHP	Learn MYSQL database connectivity with PHP server and sessions and cookies
13	To become familiar with CodeIgniter PHP MVC Framework	Learn to program PHP web service with JSON data
14	To become familiar with Kubernetes environment and understand its basics	Learn installation of CodeIgniter PHP MVC framework and learn its basic directory structure
15	To understand basics of dockers for developing web applications	Learn to program web applications using CodeIgniter PHP MVC framework.

## List of Lab Objectives - Courses of Spring 2020

Prescribed List of Practicals					
<b>Name of Teacher</b>		Ms. Zahid Hussain			
<b>Course Name</b>		Object oriented programming	<b>Course Code</b>		SW121
<b>Batch</b>		19SW	<b>Year</b>	1 <sup>st</sup>	<b>Semester</b> 2 <sup>nd</sup>
S. No	Lab Hand-out Title	Learning Outcome			
1	Installation of Java, Basic Program Structure, Identifiers and Primitive data types	To configure Java software developers kit, Java run time environment, Java virtual machine.  To sketch, compile and run basic java programs.			
2	Demonstrating various operators in Java	To Understand operator's precedence and type promotion rules			
3	Working with iterative structures	To implement interactive control structures for, for each, while and do loop			
4	Working with Conditional structures	To implement conditional control structures if, if else, else if else, switch			
5	Implementation of arrays	To learn how to build single and multi dimensional arrays in java			
6	Implementing the concepts of Encapsulation	To learn how to create a class and its objects. To declare methods and constructors, invoking them.			
7	Implementing the concepts of inheritance	To demonstrate inheritance, analyzing access modifiers at various levels of inheritance			
8	Implementing the concepts of Polymorphism	To demonstrate the concept of polymorphism. To achieve method overloading and overriding.			
9	Exception and Error Handling.	To resolve runtime errors using exception handling mechanism. To use try, catch and finally blocks			
10	Demonstrating Threads and Multi Threaded Programming logics	To assemble a code to define, instantiate and start new threads using both java.lang.Thread and java.lang.Runnable			
11	Understanding I/O Fundamentals	To construct basic File I/O, and Streams Reading Ordinary, Text Files, Reading Binary Files, Writing Text Files, Writing Binary Files.			
12	Building GUI components	To compose a java code for creating a basic windows form. To use containers and GUI components			
13	Applying various Layouts managers	To apply various layout managers Flow Layout, Border Layout etc.			
14	Java Event handling	To demonstrate the event handling using AWT by implementing the listeners.			
15	Java Database Connectivity	To learn how to use JDBC API to develop database applications. To perform basic JDBC operations by submitting SQL queries			

Prescribed List of Practicals

Name of Teacher	Zubair Ahmed				
Course Name	Operating system concepts	Course Code	SW221		
Batch	18SW	Year	2 <sup>nd</sup>	Semester	4 <sup>th</sup>

#	Lab Hand-out Title/Objective	Learning Outcome
1	Installation Procedure of Windows	Install and configure Windows
2	To become familiar with Command Prompt	Operate Windows with commands
3	Working with Batch Files	Automate tasks with batch scripts
4	Getting familiar with Control Panel and Task Scheduler	Schedule tasks and operate control panel
5	Working with Windows File Protection and User Privileges	Set user privileges and protect files
6	Becoming familiar with Network Manager and Windows File Sharing	Share files over a Network
7	Installing a Desktop Sharing Environment using SSH	Remotely access and collaborate on a computer desktop
8	Creating Ghost Installations and working with Utility Software	Use utility software
9	Installing a Linux Environment/Setting up a Virtual Environment for Linux	Use VMware to set up a virtual environment for Linux
10	Getting familiar with Ubuntu GUI	Work with Ubuntu
11	Familiarization with some of the most frequently used Linux Commands	Operate Linux with shell
12	Introduction to Shell scripting	Automate tasks with shell scripting
13	Simulating CPU Scheduling Algorithms	Demonstrate understanding of scheduling algorithms through programs
14	Simulating Memory Management Techniques	Demonstrate understanding of Memory Management techniques through Programs
15	Case Studies	Understand working of modern operating Systems

Prescribed List of Practicals



Name of Teacher	Aisha Ashraf				
Course Name	Computer Networks	<b>Course Code</b>	SW226		
Batch	18SW	<b>Year</b>	2 <sup>nd</sup>	<b>Semester</b>	4 <sup>th</sup>

#	Lab Hand-out Title/Objective	Learning Outcome
1	To work with cable specification, installation and troubleshooting.	
2	To design a peer to peer network.	
3	To become familiar with sub netting concepts.	
4	To become familiar with use of various CMD commands.	
5	To become familiar with the basic configuration of a switch using packet tracer software.	
6	Configure a network topology using packet tracer software.	
7	Cabling a Network and Basic Router Configuration.	
8	To become familiar with command line interface (CLI) and examining router interfaces, setting passwords and saving configuration files of routers.	
9	To configure the STATIC routes between two routers and to configure the DEFAULT routes between two routers to allow data transfer without the use of dynamic routing protocols.	
10	To configure the distance vector routing protocol on two routers.	
11	To configure the RIP dynamic routing protocol on two routers.	
12	To configure the IGRP dynamic routing protocol on two routers.	
13	To configure the EIGRP dynamic routing protocol on two routers.	
14	To become familiar with network security.	
15	Basic Access Control Lists.	

Name of Teacher	Arsalan Aftab Memon				
Course Name	Software Design and Architecture	Course Code	SW227		
Batch	18SW	Year	2 <sup>nd</sup>	Semester	4 <sup>th</sup>

#	Lab Hand-out Title/Objective	Learning Outcome
1	Introduction to UML and to become familiar with use case diagrams	CLO-3
2	Class Diagram	CLO-3
3	Interaction diagrams	CLO-3
4	State Transition Diagram	CLO-3
5	Sequence diagram	CLO-3
6	To implement Singleton Pattern	CLO-3
7	To implement Abstract Factory Pattern	CLO-3
8	To implement Adapter Pattern	CLO-3
9	To implement Decorator Pattern	CLO-3
10	To implement Observer Pattern	CLO-3
11	To implement Iterator Pattern	CLO-3
12	CRC Modeling	CLO-3
13	Procedural design (Pseudo code)	CLO-3
14	Procedural design (Decision table)	CLO-3
15	Case study	CLO-3

Name of Teacher	Ms. Samita Bai				
Course Name	Data Science & Analytics	<b>Course Code</b>	SW-326		
Batch	17-SW	<b>Year</b>	Third	<b>Semester</b>	6 <sup>th</sup>

#	Lab Hand-out Title	Learning Outcome
1	To become familiar with Mongo DB for working with NOSQL	Learn basics of NOSQL databases and MongoDB installation
2	To become familiar with DDL, DML and Data Retrieval commands in Mongo DB	Learn DDL (create, drop DBs), DML (insert, update & delete documents) and Data Retrieval commands of Mongo DB
3	Hadoop File system	Learn the basics of Hadoop filing system
4	MapReduce Framework	Learn the concepts of MapReduce framework
5	Spark Basics and Running Spark Applications on Hadoop	Learn the basics of Spark and execute its applications on Hadoop.
6	PyCharm IDE for Python	Learn the installation of PyCharm and get familiar with its GUI.
7	Data types, Control structures and Functions in Python	Learn the core programming concepts of Python including data types, control structures and functions.
8	Input/Output and Exceptions in Python	Learn the input/output mechanism and exception handling in Python.
9	Python libraries for Data Sciences & Machine Learning (NumPy, SciPy and SciKit)	Learn to use various Data Science and Machine learning Python libraries.
10	Linear Regression using SciKit	Learn to perform linear regression using SciKit library.
11	Supervised learning: Naïve Bayes and Support Vector Machines using SciKit	Learn to use SciKit library for performing supervised learning.
12	Unsupervised learning: Clustering using SciKit	Learn unsupervised learning using SciKit
13	Confusion Matrix and cross validation for Data Evaluation	Learn to evaluate data using Confusion matrix and cross validation
14	R language, Data Structures, Manipulation, Functions.	Learn basics of R language including data structures, manipulation and functions.
15	Case Study: Working with real datasets for prediction and categorization tasks.	Learn to work with real datasets for prediction and categorization tasks.

Prescribed List of Practicals					
Name of Teacher	Engr. Mariam Memon				
Course Name	Mobile Application Development	<b>Course Code</b>	SW427		
Batch	17SW	<b>Year</b>	3 <sup>rd</sup>	<b>Semester</b>	6 <sup>th</sup>

#	Lab Hand-out Title/Objective	Learning Outcome
1	Setting up the Development Environment for building Mobile Applications	Getting familiar with IDE for Mobile Development
2	Creating User Interfaces for Mobile Apps	Design UIs using various layout managers
3	Writing programs for Mobile Application	Develop interactive mobile applications
4	Working with Intents	Develop apps with multiple activities
5	Writing programs for reading sensors	Develop apps that use built-in mobile sensors
6	Using Native google Maps and Geocoding	Design location aware apps
7	Using Concurrent programming in Mobile Applications	Create multi-threaded mobile apps
8	Making program to use Bluetooth	Design app that uses Bluetooth.
9	Working with Broadcast Receivers	Work with broadcast receivers
10	Using Fragments, fragment life-cycle and fragment transactions	Work with fragments
11	Programming Services	Design mobile services
12	Writing programs for SQLite Database to store and retrieve data	Develop database oriented apps
13	Integrating Facebook API with Mobile Apps	Add login with Facebook feature in mobile apps
14	App packaging and publishing it to an app store	Publish apps on app store
15	Case study/Project	Present your project

Name of Teacher	Rabia Iftikhar				
Course Name	Software Quality Engineering	<b>Course Code</b>	SW426		
Batch	F-16SW	<b>Year</b>	4 <sup>th</sup>	<b>Semester</b>	8 <sup>th</sup>

#	Lab Hand-out Title/Objective	Learning Outcome
1	Validation and verification	CLO-3
2	Developing test cases	CLO-3
3	Application of Black box testing	CLO-3
4	Applying OO testing strategies	CLO-3
5	Unit testing using JUnit	CLO-3
6	Creating test suites using JUnit	CLO-3
7	Creating Mocks using Mockito	CLO-3
8	Integration testing	CLO-3
9	Coding and testing cross reference	CLO-3
10	Web Functional Testing using Selenium	CLO-3
11	Application of formal methods	CLO-3
12	Producing log Using Log4J	CLO-3
13	Working with performance testing	CLO-3
14	Working with load testing	CLO-3
15	Case study	CLO-3

Prescribed List of Practicals

Name of Teacher	Shafiya Qadeer				
Course Name	Cloud Computing	Course Code	SW425		
Batch	F-16SW	Year	4 <sup>th</sup>	Semester	8 <sup>th</sup>

Serial No.	Objectives	Learning Outcomes
01	To study cloud architecture and cloud computing model	-Provide an overview of concepts of Cloud Computing & encourage students to indulge into research in Cloud Computing.
02	To enable students to set up a Linux environment using VMware	Enable students to set up a Linux environment using VMware
03	To Installation and Configuration of virtualization using Kernel based Virtual Machine (KVM)	Understand the concepts of virtualization. & KVM architecture and its configuration.
04	To work with Remote Method Invocation (RMI) API	Understand and learn use of RMI API & create programs using RMI API
05	work with Remote Method Invocation (RMI) Object Serialization	- Understand and learn use of RMI Object Serialization. - Create programs using RMI Object Serialization.
06	To work with Remote Method Invocation (RMI) over Internet Inter-ORB Protocol (IIOP)	- Understand the basics RMI-IIOP and differences between RMI and RMI-IIOP. - Understand and learn use of RMI-IIOP. -Create programs using RMI-IIOP.
07	To study and implementation of Infrastructure as a Service	-Understand concepts of virtualization and to use cloud as Infrastructure as a services. - Learn the technique and its complexity - Understand the importance of this technique from application point of view
08	To study and implementation of identity management	-To make the students understand use of cloud as Platform, Storage as a services. -To learn the efficient tools to implement the technique
09	To Study Cloud Security management	-Understand concepts of virtualization and to use cloud as Infrastructure as a services.  -Learn the technique and its complexity  -Understand the importance of this technique from application point of view
10	To Implement Multithreading	-To understand the security features of Cloud.  -To learn the technique of application security management and its complexity

		-To understand the importance of cloud security management from application point of view
11	To Work with Spring Framework	- To explore different features of Spring Framework
12	To become familiar with Cloud Computing using Microsoft Azure	-Microsoft Azure
13	To become familiar with Amazon Web Services (AWS)	-To Develop distributed application using Amazon Web services.
14	To become familiar with Amazon's REST Full web services	-To Develop distributed application using Amazon REST FUL Web services.
15	Case Study (Mini Project)	<p>-To understand concepts of virtualization and to use cloud as Infrastructure, Platform, and Software services.</p> <p>-To Create a web application, deploy it on cloud and its complexity</p> <p>-To learn the efficient tools to implement the application on cloud.</p>

## List of Lab Objectives - Courses of Fall 2020-2021

**Mehran University of Engineering and Technology, Jamshoro**

FRM-003/00/QSP-004

Dec, 01, 2001

### Prescribed List of Practicals

#### Department of Software Engineering

Name of Teacher	Rabia Iftikhar		
Course Name	Web Engineering	Course Code	SW417
Batch	17SW	Year	4 <sup>th</sup>
Credit Hours	3 hours/week	Total Marks	50
Semester Start Date	30 <sup>th</sup> November 2020	Semester End Date	

#	Lab Hand-out Title/Objective	Learning Outcome	Credit Hours
1	To understand HTML basics for developing web applications	CLO-3	3
2	To become familiar with HTML5 semantic and multimedia elements	CLO-3	3
3	To become familiar with Javascript basics for user interaction	CLO-3	3
4	To become familiar with CSS for styling web applications	CLO-3	3
5	To become familiar with Bootstrap styling framework	CLO-3	3
6	To become familiar with PHP basics and installation of web server	CLO-3	3
7	To become familiar with control structures and arrays in PHP	CLO-3	3
8	To become familiar with functions and form handling and file handling in PHP	CLO-3	3
9	To become familiar with AJAX for data fetching	CLO-3	3
10	To become familiar with sessions and cookie management in PHP	CLO-3	3
11	To become familiar with database connectivity using PHP	CLO-3	3
12	To become familiar with web services using PHP	CLO-3	3
13	To become familiar with Codeigniter PHP MVC Framework	CLO-3	3
14	To become familiar with Kubernetes environment and understand its basics	CLO-3	3
15	To understand basics of dockers for developing web applications	CLO-3	3

<b>Signature</b>	
Signature of Teacher	Dated: 18/02/21
Remarks of DMRC	Dated: 17/02/21
Signature of Chairman	Dated:

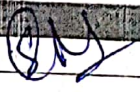
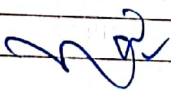


Prescribed List of Practicals

Department of Software Engineering

Name of Teacher	Ms. Shafiya Qadeer Memon		
Course Name	Database Systems	Course Code	SW215
Batch	19SW	Year	2 <sup>nd</sup>
Credit Hours	3 hours/week	Semester	3 <sup>rd</sup>
Semester Start Date	11-01-2021	Total Marks	50
		Semester End Date	

#	Lab Hand-out Title	Learning Outcome	Credit Hours
1	Installation of ORACLE	DBMS Types, Oracle versions & installation	3
2	To become familiar with Data Modeling	ER modeling	3
3	To become familiar with Normalization	First second and third normal form	3
4	To become familiar with Demoralization.	Methods of DE normalization	3
5	To become familiar with Database Connectivity	JDBC	3
6	To become familiar with SQL Injections and Prepared Statements	Database Security	3
7	To become familiar with Joins	Joining Multiple Tables	3
8	To become familiar with Sub-Queries.	Single & Multiple row Subqueries	3
9	To become familiar with views and indexes.	Simple & Complex Views, Indexes	3
10	To Grant privileges to users and creating user accounts	Granting & revoking Access Rights	3
11	Introduction to PL/SQL, control structure and data types	PL/SQL Environment & Structure	3
12	To become familiar Cursors in PL/SQL	Implicit & Explicit Cursors	3
13	To become familiar with Exception Handling	Pre-defined & User Defined Exceptions	3
14	To become familiar with stored procedures and stored functions.	Creating Procedures and Functions	3
15	Project	Hands on the RDBMS	3


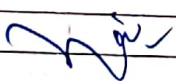
<b>Signature</b>	
Signature of Teacher	
Remarks of DMRC	
Signature of Chairman	
	Dated: 12-02-21
	Dated: 17/02/21
	Dated:

Prescribed List of Practicals

Department of Software Engineering

Name of Teacher	Ms. Shafiya Qadeer Memon		
Course Name	Database Systems	Course Code	SW215
Batch	19SW	Year	2 <sup>nd</sup>
Credit Hours	3 hours/week	Semester	3 <sup>rd</sup>
Semester Start Date	11-01-2021	Total Marks	50
		Semester End Date	

#	Lab Hand-out Title	Learning Outcome	Credit Hours
1	Installation of ORACLE	DBMS Types, Oracle versions & installation	3
2	To become familiar with Data Modeling	ER modeling	3
3	To become familiar with Normalization	First second and third normal form	3
4	To become familiar with Demoralization.	Methods of DE normalization	3
5	To become familiar with Database Connectivity	JDBC	3
6	To become familiar with SQL Injections and Prepared Statements	Database Security	3
7	To become familiar with Joins	Joining Multiple Tables	3
8	To become familiar with Sub-Queries.	Single & Multiple row Subqueries	3
9	To become familiar with views and indexes.	Simple & Complex Views, Indexes	3
10	To Grant privileges to users and creating user accounts	Granting & revoking Access Rights	3
11	Introduction to PL/SQL, control structure and data types	PL/SQL Environment & Structure	3
12	To become familiar Cursors in PL/SQL	Implicit & Explicit Cursors	3
13	To become familiar with Exception Handling	Pre-defined & User Defined Exceptions	3
14	To become familiar with stored procedures and stored functions.	Creating Procedures and Functions	3
15	Project	Hands on the RDBMS	3

Signature:		
Signature of Teacher		Dated: 12-02-21
Remarks of DMRC		Dated: 17/02/21
Signature of Chairman		Dated:

**Mehran University of Engineering and Technology, Jamshoro**

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Dec, 01, 2001


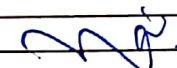
**Prescribed List of Practicals**

**Department of Software Engineering**

<b>Name of Teacher</b>	Engr. Mariam Memon				
<b>Course Name</b>	Data Structures & Algorithms	<b>Course Code</b>	SW212		
<b>Batch</b>	19SW(I,II,III)	<b>Year</b>	3 <sup>rd</sup>	<b>Semester</b>	3 <sup>rd</sup>
<b>Credit Hours</b>	3 hours/week		<b>Total Marks</b>	50	
<b>Semester Start Date</b>	10 <sup>th</sup> Jan 2021		<b>Semester End Date</b>		

#	Lab Hand-out Title	Learning Outcome	Taxonomy Level
1	To become familiar with conditional and control structures in Java.	Efficiently use conditional structures and loops	P4
2	Implementation of Objects and classes.	Implement polymorphism, inheritance and encapsulation.	P4
3	Implementation of Arrays in Java	Implement various algorithms on arrays	P4
4	Implementation of Linear Search Algorithm.	Search elements in arrays sequentially	P4
5	Implementation of Binary Search Algorithm.	Apply binary search on arrays	P4
6	Implementation of Linked list.	Implement various algorithms on linked data structure	P4
7	Implementation of Queues.	Implement queues with its operations	P4
8	Implementation of Stacks.	Implement stack data structure with its operations.	P4
9	Implementation of Merge sort & Heap sort.	Apply merge and heap sort algorithms on a list of items	P4
10	Implementation of Bubble sort, Quick Sort and insertion sort.	Apply bubble, quick and insertion sort algorithms on a list of items	P4
11	Implementation of Recursion.	Program recursive functions	P4
12	Implementation of Trees.	Implement tree structure and its operations	P4
13	Implementation of Graph.	Implement graph data structure in Java	P4
14	Implementation of Binary tree traversals.	Work with binary tree traversals.	P4
15	Case study	Present your project	P4

**Signature**

Signature of Teacher		Dated: 15/02/21
Remarks of DMRC		Dated: 17/02/21
Signature of Chairman		Dated:

**Prescribed List of Practicals**

**Department of Software Engineering**

<b>Name of Teacher</b>	Arsalan Aftab Memon		
<b>Course Name</b>	Introduction to Information and Communication Technologies	<b>Course Code</b>	(SW-113)
<b>Batch</b>	20SW-I, II & III	<b>Year</b>	1 <sup>st</sup> <b>Semester</b> 1 <sup>st</sup>
<b>Credit Hours</b>	3 hours/week	<b>Total Marks</b>	50
<b>Semester Start Date</b>	<b>Semester End Date</b>		

#	Lab Hand-out Title	Learning Outcome	Credit Hours	CEOs
1	Understanding your operating system and troubleshooting basic problems		03	03
2	Efficiently using Internet and Search Engines		03	03
3	Getting familiar with MS Word	--	03	03
4	Working with Advanced features of MS Word		03	03
5	Technical Writing with MS Word		03	03
6	Working with MS PowerPoint		03	03
7	Enhancing presentations using animations and business models		03	03
8	Getting familiar with MS Excel		03	03
9	Working with formulae and functions in MS Excel		03	03
10	Using a sophisticated text editor for programming		03	03
11	Getting familiar with Git and GitHub		03	03
12	Team Collaboration using a Remote Access Software		03	03

13	Creating Google Forms	03	03
14	Getting familiar with basic HTML Syntax	03	03
15	Case Study	03	03

<b>Signature</b>	
Signature of Teacher	Dated: 15/02/21
Remarks of DMRC	Dated: 17/02/21
Signature of Chairman	Dated:

**Department of Software Engineering**  
**Mehran University of Engineering and Technology, Jamshoro**

**Prescribed List of Practicals**


<b>Name of Teacher</b>	Dr. Naeem Ahmed Mahoto				
<b>Course Name</b>	Programming Fundamentals	<b>Course Code</b>	SW 112		
<b>Batch</b>	20-SW	<b>Year</b>	1 <sup>st</sup>	<b>Semester</b>	1 <sup>st</sup>
<b>Credit Hours</b>	3 hours/week	<b>Total Marks</b>	50		

S.No.	Lab Hand-out Title	Lab Outcome	Credit Hours	CLOs	Assessment	Remarks
1	Installation of Turbo C++, Dev-C++ IDEs, Basic C++ Program structure and Programming syntax	To become familiar with basic programming constructs of C++. Compiling and execution of C++ programs. To learn how to use Turbo C++ and Dev-C++ IDEs to create console-mode applications. Source code and Object code, Language Translators	3	3	Lab Tasks, Assignments and Lab Tests	--
2	C++ Primitive datatypes. Variables and constants.	To become familiar with C++ Primitive data types, such as int, char, float etc. Variable declaration, definition and initialization. Variable names / Identifiers. Output with cout : single character and other data types. Input with cin: Single character, word and multiword. Escape Sequences.				--
3	To become familiar with operators in C++	To demonstrate the working of various operators such as Arithmetic, Relational, Logical and Bitwise operators. To understand operator precedence.	3	3		--
4	Working with iterative structures	To understand Control Structures (Iterative statements/Loops) such as for, while, and do-while loop.	3	3		--
5	Working with conditional structures	To know how to compare the given data values. How to define the logical expressions. Writing code using if and switch statements.	3	3		--
6	To become familiar with User Defined Data Types (Structures and Enumeration)	Declaring, Defining and initializing structure. Applications of structure datatype	3	3		--

7	To become familiar with Functions in C++	Functions and how to define and implement them in a program.	3	3	Lab Tasks, Assignments and Lab Tests	--
8	Implementation of arrays	Declaring, Defining and initializing the arrays. To learn how to traverse arrays using loops.	3	3		--
9	To become familiar with Pointers	Learning C++ pointers, and pointer variables and how to define and use pointers in programs	3	3		--
10	Introduction to Object Oriented Programming	To become familiar with OOP, Objects and Classes.	3	3		--
11	To become familiar with inheritance and Polymorphism	Implementing the concepts of inheritance and Polymorphism. Learning about (Method Overloading) and (Method Overriding)	3	3		--
12	To become familiar with Strings	C++ String class and built-in methods of String class and their use for string manipulation	3	3		--
13	Operator overloading					
14	To become familiar with Streams and Files	To Understand basic File I/O, and Streams. To understand the Hierarchy of classes to deal with Input and Output streams.	3	3		--
15	Basic Graphic Programming in C++	Introduction to Graphics in C++. Writing graphics programs with graphics.h. creating basic shapes like circle, rectangle, line, ellipse, and display text.	3	3		--

**Signature**

Signature of Teacher

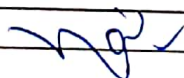


Dated: 15/02/21

Remarks of DMRC

Dated: 17/02/21

Signature of Chairman



Dated:

## List of Lab Objectives - Courses of Spring 2021

Mehran University of Engineering and Technology, Jamshoro				
				FRM-003/00/QSP-004 Dec, 01, 2001
Prescribed List of Practicals				
Department of Software Engineering				
<b>Name of Teacher</b>	Pirah Memon			
<b>Course Name</b>	Software Quality Engineering	<b>Course Code</b>	SW426	
<b>Batch</b>	17SW	<b>Year</b>	4th	<b>Semester</b> 8 <sup>h</sup>
<b>Credit Hours</b>	3 hours/week	<b>Total Marks</b>	50	
<b>Semester Start Date</b>	18-05-2021		<b>Semester End Date</b>	

#	Lab Hand-out Title	Learning Outcome	Credit Hours
1	Applying verification and validation on a software program.	Learning for opting the best methodology depending on the specification of the software.	3
2	Designing the Software Test Cases	Working with the test cases to conceptualize the working of Application	3
3	Techniques of Black Box testing.	Working with the different black box testing techniques to understand the functionality and non- functionality of the system	3
4	Exploring object oriented testing strategies and techniques.	Working with the object oriented testing techniques to understand system and subsystem testing .	3
5	Developing unit testing using Junit framework.	Working with the Junit test frame to understand the dynamic behavior of the system	3
6	Creating test suites and test runners using Junit.	Understanding and designing test cases of different scenario using testsuites and testrunners.	3


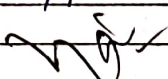


**Prescribed List of Practicals**

**Department of Software Engineering**

<b>Name of Teacher</b>	Engr. Rabia Iftikhar		
<b>Course Name</b>	Mobile Application Development	<b>Course Code</b>	SW327
<b>Batch</b>	18SW(I, II, III)	<b>Year</b>	3 <sup>rd</sup>
<b>Credit Hours</b>	3 hours/week	<b>Total Marks</b>	50
<b>Semester Start Date</b>	18 <sup>th</sup> May 2021	<b>Semester End Date</b>	

#	Lab Hand-out Title	Learning Outcome	Credit Hours
1	Setting up the Development Environment for building Mobile Applications	Getting familiar with IDE for Mobile Development	3
2	Creating User Interfaces for Mobile Apps	Design UIs using various layout managers	3
3	Writing programs for Mobile Application	Develop interactive mobile applications	3
4	Working with Intents	Develop apps with multiple activities	3
5	Writing programs for reading sensors	Develop apps that use built-in mobile sensors	3
6	Using Native google Maps and Geo-coding	Design location aware apps	3
7	Using Concurrent programming in Mobile Applications	Create multi-threaded mobile apps	3
8	Making program to use Bluetooth	Design app that uses Bluetooth.	3
9	Working with Broadcast Receivers	Work with broadcast receivers	3
10	Using Fragments, fragment life-cycle and fragment transactions	Work with fragments	3
11	Programming Services	Design mobile services	3
12	Writing programs for SQLite Database to store and retrieve data	Develop database oriented apps	3
13	Integrating Facebook API with Mobile Apps	Add login with Facebook feature in mobile apps	3
14	App packaging and publishing it to an app store	Publish apps on app store	3
15	Project	Present your project	3

Signature		
Signature of Teacher		Dated: 17-05-2021
Remarks of DMRC	Approved	Dated: 20-05-2021
Signature of Chairman		Dated:

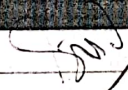
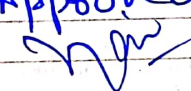
**Department of Software Engineering**  
**Mehran University of Engineering and Technology, Jamshoro**

**Prescribed List of Practicals**

<b>Name of Teacher</b>	Mr. Sajjad Ali	<b>Course Code</b>	SW 326
<b>Course Name</b>	Data Science and Analytics	<b>Year</b>	3 <sup>rd</sup>
<b>Batch</b>	18-SW	<b>Semester</b>	6 <sup>th</sup>
<b>Credit Hours</b>	3 hours/week	<b>Total Marks</b>	50

S.No.	Lab Hand-out Title	Learning Outcome	Credit Hours
1	To become familiar with Mongo DB for working with NOSQL.	Introduction to NOSQL and MongoDB database. Mongo Installation.	3
2	To become familiar with DDL and Data Retrieval commands in Mongo DB	Create and Drop MongoDB databases, Collections and Documents. Query data from MongoDB Collections.	
3	To become familiar with DML commands in Mongo DB	Manipulate MongoDB Collections and Documents.	3
4	To become familiar with MongoDB Aggregation and Aggregation Pipeline	Use aggregation pipeline stages on the data	3
5	To become familiar with Python and PyCharm IDE for Python	Introduction to Python and PyCharm IDE. Installation of PyCharm IDE.	3
6	To become familiar with Data types, Control Structures and Functions and in Python	Python Data types and Python Methods.	3
7	To become familiar with Input/output and Exceptions in Python	Exception Handling and Filing in Python.	3
8	To become familiar with Python libraries for Data Sciences (NumPy and SciPy)	Learning and Working with Data Science Libraries.	3
9	To become familiar with Python libraries for Machine Learning (SciKit)	Machine Learning Basics and SciKit Library for Data Science and Machine Learning	3
10	To become familiar with Linear	Learning Regression and Linear Regression using SciKit	3

	Regression using SciKit		
11	To become familiar with Supervised learning: Naïve Bayes and Support Vector Machines using SciKit	Learn Supervised Learning Algorithms using	3
12	To become familiar with Unsupervised learning: Clustering using Sci Kit	Learn Unsupervised Learning Algorithms using SciKit	3
13	To become familiar with Confusion Matrix for Data Evaluation	Learn Confusion Matrix for Data Evaluation	
14	To become familiar with cross validation for Data Evaluation	Learn Evaluation Matrix validation	3
15	Case Study: Working with real datasets for prediction and categorization tasks.		3

<b>Signature</b>		
Signature of Teacher		Dated: 17/05/21
Remarks of DMRC	Approved.	Dated: 20-05-21
Signature of Chairman		Dated:

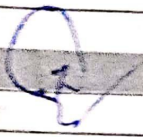

## Prescribed List of Practicals

## Department of Software Engineering

Name of Teacher]	Zubair Ahmed		
Course Name	Operating Systems Concepts	Course Code	SW221
Batch	19SW	Year	2 <sup>nd</sup> Semester 4 <sup>th</sup>
Credit Hours	3 hours/week	Total Marks	
Semester Start Date	31 <sup>st</sup> May 2021		

#	Lab Hand-out Title	Learning Outcome	Credit Hours
1	Installation Procedure of Windows	Install and configure Windows	3
2	To become familiar with Command Prompt	Operate Windows with Commands	3
3	Working with Batch Files	Automate tasks with batch scripts	3
4	Getting familiar with Control Panel and Task Scheduler	Schedule tasks and operate control panel	3
5	Working with Windows File Protection and User Privileges	Set user privileges and protect files	3
6	Becoming familiar with Network Manager and Windows File Sharing	Share files over a network	3
7	Installing a Desktop Sharing Environment using SSH	Remotely access and collaborate on a computer desktop	3
8	Creating Ghost Installations and working with Utility Software	Use utility software	3
9	Installing a Linux Environment/Setting up a Virtual Environment for Linux	Use VMware to set up a virtual environment for Linux	3
10	Getting familiar with Ubuntu GUI	Work with Ubuntu	3
11	Familiarization with some of the most frequently used Linux Commands	Operate Linux with shell	3
12	Introduction to Shell Scripting	Automate tasks with shell scripting	3
13	Simulating CPU Scheduling Algorithms	Demonstrate understanding of scheduling algorithms through programs	3

14	Simulating Memory Management Techniques	Demonstrate understanding of Memory Management techniques through programs	3
15	Case Studies	Understand working of modern operating systems	3

Signature		Dated: 17-05-2021
Remarks of DMRC	Approved	Dated: 20-05-2021
Signature of Chairman		Dated:

## List of Practicals

## Department of Software Engineering

Name of Teacher	Zahid Hussain Khaskheli		
Course Name	Object Oriented Programming	Course Code	SW121
Batch	20SW	Year	2 <sup>nd</sup>
Semester Start Date	31-05-2021	Semester End Date	30-09-2021
		Semester	3 <sup>rd</sup>

#	Topic	Learning Outcome	Lecture Hours	CLOs
1	Installation of Java, Basic Program Structure, Identifiers and Primitive data types	To configure Java software developers kit, Java run time environment, Java virtual machine. To sketch, compile and run basic java programs.	3	3
2	Demonstrating various operators in Java	To demonstrate various operators. To Understand operator's precedence and type promotion rules.	3	3
3	Working with iterative structures	To implement interactive control structures - for, for each, while and do loop	3	3
4	Working with conditional structures	To implement conditional control structures - if, if else, else if else, switch	3	3
5	Implementation of arrays	To learn how to build arrays in java	3	3
6	Implementing the concepts of encapsulation	To learn how to create a class and its objects. To declare methods and	3	3
7	Implementing the concepts of inheritance	To demonstrate inheritance, analyzing access modifiers at various levels of inheritance	3	3
8	Implementing the concepts of Polymorphism	To demonstrate the concept of polymorphism. To achieve method overloading and overriding and interfaces.	3	3
9	Exception and Error Handling	To resolve runtime errors using exception handling Mechanism. To use try, catch and finally blocks	3	3
10	Demonstrating Threads and Multi - Threaded Programming logics	To assemble a code to define, instantiate and start new threads using both java.lang.Thread and java.lang.Runnable	3	3
11	Understanding I/O Fundamentals	To construct basic File I/O, and Streams -	3	3

		Reading Ordinary, Text Files, Reading Binary Files, Writing Text Files, Writing Binary Files.		
12	Building GUI components	To compose a java code, for creating a basic windows form. To use containers and GUI components.	3	3
13	Applying various Layouts managers	To apply various layout managers - Flow Layout, Border Layout etc.	3	3
14	Java Event handling	To demonstrate the event handling using AWT by implementing The listeners.	3	3
15	Java Database Connectivity	To learn how to use JDBC API to develop Database applications. To perform basic JDBC operations by submitting SQL queries	3	3

Signature	
Signature of Teacher	 Dated: 17-05-2021
Remarks of DMRC	Approved Dated: 20-05-2021
Signature of Chairman	 Dated: