

Syllabus Book

(Master of Computer Application)
(Offered under School of Engineering)



P P Savani University

Effective From: 2022-23

CONTENT

Sr. No.	Content	Page No
1	Syllabi of First Year	1-40



FIRST YEAR MCA



P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

TEACHING & EXAMINATION SCHEME FOR MCA (Master of Computer Application) PROGRAMME AY:2022-23

Sem	Course Code	Course Title	Offered By	Teaching Scheme					Examination Scheme							
				Contact Hours				Credit	Theory		Practical		Tutorial		Total	
				Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE		
1	SESH2040	Discrete Mathematics	SH	3	0	2	5	5	40	60	0	0	50	0	150	
	SECA7010	Programming Concepts	SECA	3	4	0	7	5	40	60	40	60	0	0	200	
	SECA7020	Relational Database Management System	SECA	3	2	0	5	4	40	60	20	30	0	0	150	
	SECA7030	Web Application & Development	SECA	3	2	0	5	4	50	0	20	30	0	0	100	
	SECA7040	Computer Architecture	SECA	3	0	2	5	4	40	60	0	0	50	0	150	
	SEPD7010	Academic Writing & Communication Skills	SEPD	2	2	0	4	3	0	0	100	0	0	0	100	
	Total				31	26								850		
2	SECA7050	Programming with Python	SECA	3	4	0	7	5	40	60	40	60	0	0	200	
	SECA7061	Java Web Technologies	SECA	3	2	0	5	4	40	60	20	30	0	0	150	
	SECA7070	Computer Networks & Cyber Security	SECA	3	2	0	5	4	40	60	20	30	0	0	150	
	SECA7080	Data Structures & Algorithms	SECA	3	2	0	5	4	40	60	20	30	0	0	150	
	SECA7090	Software Engineering	SECA	3	0	2	5	5	40	60	0	0	50	0	150	
	SECA7920	Project-I	SECA	4				4	4	0	0	50	50	0	0	100
	Total				31	26								800		

P P Savani University
School of Engineering

Department of Science & Humanities

Course Code: SESH2040

Course Name: Discrete Mathematics

Prerequisite Course (s):--- Basic Mathematics

Teaching & Examination Scheme:

Teaching Scheme(Hours/Week)				Examination Scheme(Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	00	02	05	40	60	00	00	50	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- To summarize concepts of calculus to enhance ability of analyzing mathematical problems.
- To learn about and work with vector space, linear transformation and inner product space.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in%
1.	Introduction to Limit, Continuity & Differentiation Limits, Continuity, Discontinuity, Types of discontinuity, Successive Differentiation, Rolle's Theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem	06	15
2.	Sequence and Infinite Series Convergence, Divergence of sequence, Divergence of infinite series, Tests for convergence of series (Comparison, Integral, Ratio and Root), Alternating series, Absolute and Conditional convergence, Power series with applications, Taylor's and Maclaurin's series, Indeterminate forms($0/0$, ∞/∞ , $0 \cdot \infty$, $0/0$ & $1/1$).	10	20
3.	Partial Derivatives Function of several variables, Partial differentiation, Directional derivatives, Gradient, Chain rule, Tangent planes and Linear approximations, Maxima and Minima, Total differentiation.	07	15

Section II			
Module No.	Content	Hours	Weightage in%
1.	Vector Space Real vector spaces, Subspaces, Linear Dependence, Linear Independence, Span, Basis and Dimension, Row space, Column space and Null space, Rank and Nullity	08	18
2.	Linear Transformation Introduction Linear Transformation, Kernel and Range, Inverse Linear Transformation, Matrix representation of Linear Transformation	07	16
3.	Inner Product Space Real inner products, Angle and Orthogonality, Orthogonal projection, Orthonormal bases (Gram-Schmidt Process, QR-Decomposition), Least Square Approximation, Change of basis.	07	16

List of Practical(s):

Sr. No	Name of Practical	Hours
1.	Limit, Continuity & Differentiation-1	02
2.	Limit, Continuity & Differentiation-2	02
3.	Sequence and Infinite Series-1	02
4.	Sequence and Infinite Series-2	02
5.	Sequence and Infinite Series-3	02
6.	Partial Derivatives-1	02
7.	Partial Derivatives-2	02
8.	Vector Space-1	04
9.	Vector Space-2	02
10.	Linear Transformation-1	04
11.	Linear Transformation-2	02
12.	Inner Product Space-1	02
13.	Inner Product Space-2	02

Text Book (s):

Title	Author/s	Publication
Thomas' Calculus	George B. Thomas Maurice D. Weir, Joel Hass	Pearson
Elementary Linear Algebra Applications Version	Howard Anton, Charis Rorres	Wiley India Edition

Reference Book (s):

Title	Author/s	Publication
Advanced Engineering Mathematics	Erwin Kreyszig	Wiley India Edition
Linear Algebra and its Applications	David C. Lay	Pearson
Engineering Mathematics-1(Calculus)	H. K. Dass, Dr. Rama Verma	S. Chand
Introduction to Linear Algebra with Application	Jim Defranza Daniel Gagliardi	Tata McGraw Hill

Course Evaluation:**Theory:**

- Continuous evaluation consists of two tests each of 15 marks and 1 hour of duration.
- Submission of assignments which consists of 10 questions to be answered under each module and it carried of 10 marks of continuous evaluation.
- End Semester Examination will consist of 60 marks.

Tutorial:

- Continuous evaluation consists of performance of tutorial which should be evaluated out of 10 marks for each tutorial in the next turn and average of the same will be converted to 30 marks.
- MCQ based examination of 10 marks.
- Internal Viva component of 10 marks.

Course Outcome(s):

After completion of the course, the student will be able to

- make use of concepts of limit, continuity and differentiability for analyzing mathematical problems.
- examine series for its convergence and divergence.
- to demonstrate understanding of the concepts of Vector Space, Linear Transformation and inner product space.

P P Savani University
School of Engineering

Master of Computer Application

CourseCode:SECA7010

Course Name: Programming Concepts

Prerequisite Course(s):---

Teaching & Examination Scheme:

Teaching Scheme(Hours/Week)				Examination Scheme(Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	04	00	05	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- understand the mechanisms that inspire and guide the design and implementation of Programming Languages
- understand importance of object oriented approach.
- develop expertise in creating robust applications using the Java Programming Language.
- understand concepts of Interface, Lambda Expressions, Generic Programming and to implement them.
- implement application including different file operations.
- understand database connectivity and work with the JDBC applications.●

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	Introduction to Procedural Programming Paradigm Know about the basic fundamentals of C programming, Learn about the control statements, Acquire knowledge about the storage classes, Know about the arrays and structures, Gain knowledge about the pointers	08	10
2.	Object Oriented Programming Introduction to OOP, Objects and Classes, Characteristics of OOP, Difference between OOP and Procedure Oriented Programming, Summary Introduction to Java Programming - Introduction, Features of Java, Comparing Java and other languages , Java Development Kit, More Complex Programs, Java Source file structure, Prerequisites for Compiling and Running Java Programs. Java Language Fundamentals - The building Blocks of Java - Data types - variable declarations - wrapper classes - Operators and Assignment - Control structures	06	10
3.	Introducing Classes & Objects, Methods, Inheritance & Interface Objects and Classes, Inheritance, Interface Objects and Classes:	06	25

	classes, objects, objects and object variables, Local Date Class, Mutator and Accessor methods, defining your own classes, static fields and methods, method parameters, object construction, packages and the class path. Inheritance: classes, superclasses, and subclasses, overriding methods, inheritance hierarchies, polymorphism, final class and methods, casting, abstract classes and, protected access, Object: Cosmic superclass, Object Wrappers and Autoboxing and Enumeration classes. Interface.		
4.	Packages Packages (Defining a Package, Finding Packages and CLASSPATH, A Short Package Example), Packages and Member Access (A Package Access Example), Understanding Protected Members, Importing Packages, Java's Class Library Is Contained in Packages	03	5
Section II			
Module No.	Content	Hours	Weight age in%
1.	Multithreading and Exception Handling. Multithreaded Programming - Multithreading Fundamentals, The Thread Class and Runnable Interface, Creating a Thread, (One Improvement and Two Simple Variations), Creating Multiple Threads, Determining When a Thread Ends, Thread Priorities, Synchronization, Using Synchronized Methods, The synchronized Statement, Exception Handling, Generic Programming Exception Handling: dealing with errors, catching exceptions, tips for using exceptions	07	15
2.	File Handling Input and Output Input/Output Streams: reading writing bytes, combining IO steam filers, Text Input and Output: write text output, read text output, saving object in text format, character encoding, Reading and Writing, Working with Files: paths, reading and writing files, creating files and directories, copying, moving and deleting files and getting file information.	04	10
3.	JDBC The Design of JDBC, JDBC Driver Types, SQL, JDBC Configuration: URL, driver jar files, starting the database, registering the driver class, connecting to the database, Working with JDBC Statements: executing SQL statement, managing connections, statements, resultsets, SQL exceptions, Query Execution: prepared statement.	04	10
4.	The SWING & Collection Framework Introduction, Collection framework (Collection interface, list interface, set interface, sorted set interface), The collection class, Array list and Link list classes (maintaining the capacity and the link list class), iterating elements of collection (the list iterator interface), hash set and tree set classes, SWING Framework - Origins of Swing, Two Key Swing Features, Components & Containers - Understanding Layout Managers - FlowLayout, BorderLayout, GridLayout, CardLayout, GridBagLayout, The Swing Packages, A	07	15

	Simple Swing Application, differentiate Swing & Applet, GUI Events-Event Delegation Model, and Exploring Swing Components.		
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List of Practical(s):

Sr. No	Name of Practical	Hours
1.	Working with practical concepts of procedural paradigm	06
2.	Implementation of basic concepts of java fundamentals – data types, classes, objects, operators, control & looping structures.	04
3.	Implementation of compile time polymorphism.	02
4.	Implementation of Inheritance.	04
5.	Implementation of runtime polymorphism (overriding & dynamic method dispatch).	04
6.	Implementation of user defined packages.	04
7.	Implementation of thread and different methods and mechanism.	06
8.	Implementation of exception handling.	04
9.	Implementation of user defined exception handling.	02
10.	Implementation of various file operations using different streams, classes and methods.	06
11.	Implementation of database connectivity using JDBC.	06
12.	Implementation of various collection framework classes and utility.	06
13.	Implementation of SWING Framework	06

Text Book(s):

Title	Author/s	Publication
Core Java , Volume I – Fundamentals	Cay S. Horstmann	Pearson Education
Core Java , Volume II – Advanced Features	Cay S. Horstmann	Pearson Education
The complete reference Java	Herbert Schildt	Mc Grow Hill

Reference Book(s):

Title	Author/s	Publication
The class of Java	Pravin Jain	Pearson Education
Core Java, Volume 1-Fundamental	Cay S.Horstmann and Gary Cornell	Pearson Education
Object Oriented Programming through Java	P.Radha Krishna	Universities Press
Object-Oriented Programming with Java: Essentials & Applications	Raj Kumar Buyya, S. Thamarai Selvi, & Xing Chen Chu	Tata McGraw Hill

WebMaterialLink(s):

- https://onlinecourses.nptel.ac.in/noc22_cs47/preview
- <https://www.youtube.com/watch?v=rfscVS0vtbw>
- <https://inventwithpython.com/hacking/chapters>
- https://www.youtube.com/watch?v=ayi5_yx61Zg

Course Evaluation:**Theory:**

- Continuous Evaluation consists of two tests of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination consists of 60 marks.

Practical:

- Continuous Evaluation consists of the performance of practical, which will be evaluated out of 10 marks per each practical and average of the entire practical will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks during End Semester Examination.
- Viva/Oral performance consists of 30 marks during End Semester Examination.

Course Outcome(s):

After completion of the course, the student will be able to

- explain the principles of the object oriented programming paradigm specifically including abstraction, encapsulation, inheritance and polymorphism using Java.
- use an object oriented programming language, and associated class libraries.
- develop object oriented programs using Java.
- design, develop, test, and debug programs using object oriented principles in conjuncture with an integrated development environment using Java.

P P Savani University
School of Engineering

Master of Computer Application

CourseCode: SECA7020

Course Name: Relational Database Management System

Prerequisite Course (s):---

Teaching & Examination Scheme:

Teaching Scheme(Hours/Week)				Examination Scheme(Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- understand the elementary conception of Database Management Systems.
- give students knowledge of how RDBMS is managed.
- prepare a theoretical as well as practical background of RDBMS.
- understand the concepts compulsory for designing, using and implementing database systems and applications.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in%
1.	Basic concepts of DBMS Basic Concepts: Data, Database, Database systems, Database Management Systems, Need, Applications & Description of Database Approach, DBMS users, Benefits of using DBMS approach, DBMS architecture – Schema, Instance, Types of Models, Concept of Independence, Types, Role & Importance of Database languages, Taxonomy & Categorization of DBMS.	06	15
2.	Entity Relationship Diagram ER diagram – Role & Importance in database design, entity types, entity sets, Types of Attributes, Keys & Entities, Designing & Mapping of Database considering ER diagram, Example of ER Diagram considering applications, Concept of EER diagram. Database Design Concept of Relational Schema, Functional Dependencies, Normalization - definitions of 1NF, 2NF and 3NF, Boyce-Codd Normal Forms (BCNF), Multi-valued Dependency and Fourth Normal Form.	10	20
3.	Basic of SQL Basics concepts of SQL – creation, alteration using DDL,DML,DCL, structure – creation, alteration, defining constraints – Primary key,	06	15

	foreign key, unique, not null, check, IN operator, Functions - aggregate functions, Built-in functions –numeric, date, string functions, set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All , view and its types. transaction control commands – Commit, Rollback, Save point case		
Section II			
Module No.	Content	Hours	Weightage in%
1.	Fundamentals of PL/SQL Introduction to PL/SQL - Benefits of PL/SQL, Creating PL/SQL Blocks Defining Variables and Datatype, Using Variables in PL/SQL - Recognizing PL/SQL Lexical Units, Recognizing Data Types, Using Scalar Data Types, Writing PL/SQL Executable Statements, Nested Blocks and Variable Scope, Program Structures to Control Execution Flow - Conditional Control: IF Statements, Conditional Control: CASE Statements, Iterative Control: Basic Loops, Iterative Control: WHILE and FOR Loops, Iterative Control: Nested Loops	06	15
2.	Using & Managing PL/SQL Building Blocks Using Cursors and Parameters, Introduction to Explicit Cursors, Using Explicit Cursor Attributes, Cursor FOR Loops, Cursors with Parameters, Using Cursors for UPDATE, Using Multiple Cursors, Using and Managing Procedures - Creating Procedures, Using Parameters in Procedures , Passing Parameters, Using and Managing Functions - Creating Functions, Using Functions in SQL Statements.	06	15
3.	Database Triggers & Exception Handling Using and Managing Triggers - Introduction To Triggers, Creating DML Triggers, Creating DML Triggers, Creating DDL and Database Event Triggers, Managing Triggers, Exception Handling - Handling Exceptions, Trapping Oracle Server Exceptions, Trapping User-Defined Exceptions , Recognizing the Scope of Exceptions.	05	10
4.	Transaction Processing and Database backup and Recovery Transaction concepts: Transaction execution and Problems, Transaction execution and control with SQL, Transaction properties, Transaction log, Concurrency control , Locking methods for concurrency control, Timestamp methods for concurrency control, Optimistic methods for concurrency control (Read phase, validation phase, Write phase), Deadlock handling - detection and resolution, Database backup and Recovery - Need of Database backup, Database backup techniques, Types of Database failures, Types of Database recovery (Forward recovery, backward recovery and Media recovery), Recovery techniques (Deferred Update, Immediate update, Shadow Paging, Checkpoints), Buffer management.	06	10

List of Practical(s):

Sr.No	Name of Practical	Hours
1.	Implement DDL Commands (Create , Alter , drop) Table: The Create Table Command, Creating a table from a table (with data, without data, with all columns, with selected columns), Drop Table, Alter Table, Renaming Tables	02
2.	Implement DML Commands (Select, insert, update, delete)	02
3.	Implement Constraints: Defining integrity constraints using create table and the alter table command.	02
4.	Implement View, Index, Sequences, rowed, rownum, Default Value Concept	02
5.	Implement Join (Inner Join, Equi Joins, Self Join, Outer Joins)	02
6.	Implement subquery concepts	02
7.	Implement various set Operators	02
8.	Implement various single row functions: String functions, Numeric Functions, Date Functions, Date Conversion Functions	02
9.	Implement aggregate / group functions, having clause and Sorting Data, Handling Null values (IS NULL), Like Clause	02
10.	Implement Basic concepts of PL/SQL	02
11.	Implement Procedure, function, package	04
12.	Implement Triggers and Exception Handling	04
13.	Implement Transaction processing and control mechanism	02

Text Book(s):

Title	Author/s	Publication
Fundamentals of Database Systems	Ramez Elmsari, Shamkant B Navathe	Pearson Education
SQL, PL/SQL the Programming Language of Oracle	Ivan Bayross	BPB Publications
Database System Concept	Silberschatz, Korth, Sudarshan	McGraw Hill

Reference Book(s):

Title	Author/s	Publication
Database Management Systems	Ramakrishnan, Gehrke	McGraw Hill
An Introduction to Database Systems	C J Date, A Kannan, S Swaminathan	Pearson Education
PHP and MySQL 24-Hour Trainer	Andrea Tarr	Wiley

Web Material Link:

- <https://docs.oracle.com/en/database/index.html>
- <https://docs.oracle.com/database/121/SQLRF/toc.htm>

Course Evaluation:**Theory**

- Continuous Evaluation consists of two tests of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination consists of 60 marks.

Practical

- Continuous Evaluation will be cumulative of practical performances, activities, presentations, viva and submissions consisting of 20 marks.
- Practical performance/quiz/test consists of 15 marks during End Semester Exam.
- Viva/Oral performance of 15 marks during End Semester Exam.

Course Outcome(s):

After completion of the course, the student will be able to

- Knowledge of handling multiple transactions effectively, Designing Stored procedures, utilization of triggers/cursors to control and retrieve data efficiently.
- Understand the uses the database schema.
- Understand the need for normalization.
- Use different types of physical implementation of database.

Master of Computer Application

Course Code: SECA7030

Course Name: Web Application & Development

Prerequisite Course (s):---

Teaching & Examination Scheme:

Teaching Scheme(Hours/Week)				Examination Scheme(Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
01	02	00	02	50	00	20	30	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- To teach students the basics of server side scripting using PHP
- To explain web application development procedures
- To impart servlet technology for writing business logic
- To facilitate students to connect to databases using JDBC

Course Content:

Section I			
Module No.	Content	Hours	Weightage in%
1.	Introduction to PHP: Declaring variables, data types, arrays, strings, operations, expressions, control structures, functions, Reading data from web form controls like Text Boxes, radio buttons, lists etc., Handling File Uploads, Connecting to database (My SQL as reference), executing simple queries, handling results, Handling sessions and cookies.	04	25
2.	Client side Scripting: Introduction to JavaScript: JavaScript language – declaring variables, scope of variables functions, event handlers (on click, on submit etc.), Document Object Model, Form validations. Simple AJAX applications.	03	25
Section II			
Module No.	Content	Hours	Weightage in%
1.	XML: Introduction to XML, Defining XML tags, their attributes and values, Document type definition, XML Schemas, Document Object model, XHTML Parsing XML Data - DOM and SAX parsers in java	03	25
2.	Introduction to Servlets: Common Gateway Interface (CGI), Lifecycle of a Servlets, deploying a Servlets, The Servlets API, Reading Servlets parameters, Reading initialization parameters, Handling Http Request &	05	25

	Responses, Using Cookies and sessions, connecting to a database using JDBC.		
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List of Practical:

Sr. No	Name of Practical	Hours
1.	Create a PHP page using functions for comparing three integers and print the largest number.	01
2.	Write a function to calculate the factorial of a number (non-negative integer). The function accepts the number as an argument.	01
3.	WAP to check whether the given number is prime or not.	01
4.	Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.	01
5.	Write a PHP function that checks if a string is all lower case.	01
6.	Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)	01
7.	WAP to sort an array.	01
8.	Write a PHP script that removes the whitespaces from a string. Sample string : 'The quick " " brown fox' Expected Output : Thequick""brownfox	01
9.	Write a PHP script that finds out the sum of first n odd numbers.	01
10.	Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.	01
11.	Write a java script that checks if a string contains another string.	01
12.	Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.	01
13.	Create a script to construct the following pattern, using nested for loop. * * * * * * * * * *	01
14.	Write a simple java Script program to check that emails are valid.	02
15.	WAP using servlet to print first n even numbers.	02
16.	\$color = array('white', 'green', 'red') Write a java script which will display the colors in the following way : Output : white, green, red, • green • red • white	01
17.	Using switch case and dropdown list display a "Hello" message depending on the language selected in drop down list.	02
18.	Develop a page using HTML, Java script, CSS and servlet to take input from users and save it in a separate database.	02
19.	Write a java script to replace the first 'the' of the following string with 'That'. Sample : 'the quick brown fox jumps over the lazy dog.' Expected Result : That quick brown fox jumps over the lazy dog.	02
20.	Create a web page using XML. Write a program to connect a XML webpage to any database engine	04

Reference Book(s):

Title	Author/s	Publication
Web Tecchnologies	Uttam K Roy	Oxford University Press
The Complete Reference PHP	Steven Holzner	Tata McGraw-Hill
Web Programming, building internet applications	Chris Bates 2nd edition	Wiley Dremtech

Web material link:

- <https://nptel.ac.in/courses/106105084>

Course Evaluation:**Theory:**

- Faculty evaluation consists of 50 marks as per the guidelines provided by the course coordinator.
- There will be no End Semester Examination.

Practical:

- Continuous Evaluation consists of performance of practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/test consists of 30 marks during End Semester Exam.
- Viva/ Oral performance consists of 30 marks during End Semester Exam.

Course Outcome(s):

After completion of the course, the student will be able to

- Create web pages using PHP
- Identify the difference between the HTML PHP and XML documents.
- Identify the engineering structural design of XML and parse tree
- Analyze the difference between and PHP and XML.
- Understand the concept of JAVA SCRIPTS.
- Identify the difference between the Java Script and Servlet.
- Design web application using MVC architecture
- Understand the Servlet concepts.
- Apply JDBC and ODBC technologies to create database connectivity

Master of Computer Application

Course Code: SECA7040

Course Name: Computer Architecture

Prerequisite Course (s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	00	02	05	40	60	00	00	50	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- have a understanding of Digital systems and operation of a digital computer.
- learn different architectures & organizations of memory systems and processor organization
- understand the working principles of multiprocessor and parallel organization's as advanced computer architectures

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	<p>Fundamentals of Digital Logic and Data Representation. Boolean Algebra, Logic Gates, Simplification of Logic Circuits: Algebraic Simplification, Karnaugh Maps. Combinational Circuits: Adders, Mux, De-Mux, Sequential Circuits: Flip-Flops (SR, JK & D) Data Representation: Decimal, Binary, Octal and Hexadecimal numbers.</p>	08	20
2.	<p>Computer System Comparison of Computer Organization & Architecture, Computer Components and Functions, Accessing Input/output devices; Interrupts; Data transfer schemes - programmed I/O and DMA transfer; data transfer schemes for microprocessors.</p>	08	15
3.	<p>Memory System Organization Memory Hierarchy; Primary memory, Secondary Memory : Magnetic Tape, Magnetic Disk, Optical disk, Magneto-Optical Disk; Concepts of auxiliary, Associative, Cache And Virtual Memory, External Memory : Magnetic Discs, Optical Memory, Flash Memories, RAID Levels</p>	06	15

Section II			
1.	Processor Organization Instruction Formats, Instruction Sets, Addressing Modes, Addressing Modes Examples with Assembly Language [8085/8086 CPU], Processor Organization, Structure and Function. Register Organization, Instruction Cycle, Instruction Pipelining. Introduction to RISC and CISC Architecture, Instruction Level Parallelism and Superscalar Processors: Design Issues.	10	20
2.	Fundamentals of Advanced Computer Architecture Parallel Architecture: Classification of Parallel Systems, Flynn's Taxonomy, Array Processors, Clusters, and NUMA Computers. Multiprocessor Systems : Structure & Interconnection Networks, Multi-Core Computers: Introduction, Organization and Performance	10	20
3.	Case Study Pentium 4 processor Organization and Architecture	03	10

List of Tutorial:

Sr. No	Name of Tutorial	Hours
1.	Simplification of Logic Circuits using K-Map	04
2.	Number Conversion(Decimal, Binary, Hexadecimal ,Octal)	04
3.	Addition and Subtraction of binary numbers.	04
4.	Computer System	04
5.	Memory System Organization	04
6.	Processor Organization	04
7.	Fundamentals of Advanced Computer Architecture	04
8.	Case Study	02

Reference Book(s):

Title	Author/s	Publication
Modern Digital Electronics,	R.P.Jain	Tata McGraw Hill
Computer Organization & Architecture	William Stallings.	Pearson Education
Computer System Architecture	M. Morris Mano	Pearson Education.

Web material link:

- <https://nptel.ac.in/courses/106/105/106105163/>
- <http://www.intel.com/pressroom/kits/quickreffam.htm>
- web.stanford.edu/class/ee282/

Course Evaluation:**Theory:**

- Continuous Evaluation consists of two tests each of 30 marks and 1 hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Tutorial:

- Continuous evaluation consists of performance of tutorial which should be evaluated out of 10 Marks for each tutorial in the next turn and average of the same will be converted to 30 Marks.
- MCQ based examination of 10 Marks.
- Internal Viva of 10 Marks.

Course Outcome(s):

After completion of the course, the student will be able to

- design trade-offs Basic fundamentals in digital logic & structure of a digital computer.
- identify performance issues in processor and memory design of a digital computer.
- develop independent learning skills and be able to learn more about different computer architectures and hardware
- articulate design issues in the development of Multiprocessor organization & architecture

P P Savani University
School of Engineering

Master of Computer Application

Course Code: SECA7050

Course Name: Programming with Python

Prerequisite Course(s):---

Teaching & Examination Scheme:

Teaching Scheme(Hours/Week)				Examination Scheme(Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	04	00	05	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- understand importance of practical oriented approach.
- develop ability to implement real life programming problems.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
5.	Introduction Introduction to Python, History, Features and Applications of Python, Python Input Output, Python basic Operators.	03	06
6.	Python Data Types and Program Flow Control Different DataTypes in Python: Numeric, String and Sequential, Variables in Python, Conditional blocks using if, else and elseif, Simple for loops in Python, for loop using ranges, use of while loops in Python, Loop manipulation using pass, continue, break and else.	04	04
7.	Python String, List, Tuple, Set and Dictionary Manipulation String in Python and its built-in methods, List & Dictionary manipulation, Functions & methods for Tuple and Sets, Functions as Object.	05	12
8.	Python Functions Modules and Packages Organizing Python codes using functions, organizing Python projects into Modules, importing own Module as well as external Modules, understanding Packages, Programming using functions, Modules and external packages.	05	14
9.	Files in Python Introduction to file input and output, Writing Data to a File, Reading Data from a File, using loops to process files.	05	14

Section II			
Module No.	Content	Hours	Weightage in%
1.	Python Object Oriented Programming Introduction to OOPS Concept of class and its attributes, objects and instances, Inheritance and Polymorphism, Constructor and destructors, Python programming using OOP concepts.	04	14
2.	Exception Handling in Python Introduction to Exception and Errors, The Exception Handling mechanism in Python Types of testing-Black box and Glass-box.	04	14
3.	Simple Algorithms and Data structures Search Algorithms, Sorting Algorithms, Hash Tables, MD5	04	06
4.	Advanced Topics I Regular Expressions-RE and Python, Plotting using PyLab, Networking and Multithreaded, Programming-Sockets, Threads and Processes, Chat Application	06	06
5.	Advance TopicsII Security-Encryption and Decryption, Classical Cyphers Graphics and GUI Programming-Drawing using Turtle, Tkinter and Python, Other GUIs	05	10

List of Practical(s):

Sr.No	Name of Practical	Hours
1.	Installation and Introduction to Python Environment.	02
2.	Learning Input and Output in Python.	02
3.	Working with different Datatypes in Python.	02
4.	Implementation of flow control statements.	04
5.	Implementation of Lists, Dictionaries, Sets, Tuples.	02
6.	Implementation of Strings in Python.	04
7.	Implementation of functions and Modules.	04
8.	Working with Packages and use different Packages available to work with Python	04
9.	Working with files in Python.	04
10.	Implementation of OOP features.	04
11.	Basics of Exception handling, Exception handling mechanism.	02
12.	SQL Database connection using Python, Creating and searching tables, Reading and storing information on database, Programming using Database connections.	04
13.	Implement classical ciphers using python.	02
14.	Learn to plot different types of graphs using Py Plot.	02
15.	Python Regular Expressions Email, URL validation and Pattern finding using regular expression.	06
16.	Developing mini application using Python.	06
17.	Develop programs to learn GUI programming using Tkinter. Draw graphics using Turtle.	06

TextBook(s):

Title	Author/s	Publication
Learning to Program with Python	Richard L. Halterman	Pearson
Python Programming: A modular Approach	Sheetal Taneja, Naveen Kumar	Pearson

ReferenceBook(s):

Title	Author/s	Publication
Python Cook book	David Ascher, Alex Martelli	O Reilly
Introduction to Computation and Programming Using Python	John V Guttag	Prentice Hall of India

WebMaterialLink(s):

- <https://www.python.org/>
- <https://www.w3schools.com/python>
- <https://www.youtube.com/watch?v=rfscVS0vtbw>
- <https://inventwithpython.com/hacking/chapters>
- https://www.youtube.com/watch?v=ayi5_yx61Zg

Course Evaluation:**Theory:**

- Continuous Evaluation consists of two tests of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination consists of 60 marks.

Practical:

- Continuous Evaluation consists of the performance of practical, which will be evaluated out of 10 marks per each practical and average of the entire practical will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks during End Semester Examination.
- Viva/Oral performance consists of 30 marks during End Semester Examination.

Course Outcome(s):

After completion of the course, the student will be able to

- Understand the syntax and semantics of the Python language.
- to be able to draw various kinds of plots using PyLab.
- develop efficient programs with their own logic & capabilities.
- Learn added features of Python in real life applications.
- Learn and develop small application.

Master of Computer Application

CourseCode: SECA7061

Course Name: Java Web Technologies

Prerequisite Course (s): SECA7010

Teaching & Examination Scheme:

Teaching Scheme(Hours/Week)				Examination Scheme(Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- understand J2EE architecture.
- construct web application using servlets, Java Server pages.
- learn advanced java programming concepts like hibernate, Enterprise java beans, etc.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	Client Server Technology Introduction to Single Tier Architecture, Two Tier Architecture, Multitier Architecture, HTTP protocol: Request and Response, Web Container, Web Server, Overview of J2EE, J2EE Architecture, J2EE Technology.	05	10
2.	Servlets Programming Introduction, Servlet Implementation, Servlet configuration, Servlet life cycle, servlet session, Context and Collaboration, Web Archive files, Deployment Descriptor, Deployment Configuration. .	09	20
3.	Java Server Page JSP: Overview, lifecycle, Architecture, JSP Elements: Directives, Scripting, Action tags, Implicit Objects, Comments, Custom Tags, page, Scope: page, request, session, JSP Exception Handling.	09	20
Section II			
1.	JDBC Introduction to java database programming, JDBC driver	09	20

	types, Steps to connect JDBC, JDBC statement interface, JDBC prepared statement interface, JDBC callable statement interface, Transaction management, Java beans.		
2.	Web Services Introduction, Web Service Technology, J2EE for web service, developing web services.	04	10
3.	Advance Frameworks Hibernate Introduction, Hibernate Architecture, component of Hibernate, hibernate query Language, Hibernate O/R mapping. EJB Enterprise bean architecture, Benefits of enterprisebeantypesof beans, Accessing beans, packaging beans.	09	20

List of Practical:

Sr. No	Name of Practical	Hours
1.	Introduction to client-server architecture	02
2.	Study and implementation of servlet programming	06
3.	Study and implementation of java server page	06
4.	Study and implementation of java database connectivity	06
5.	Study and implementation of web service	04
6.	Study and implementation of hibernate	04
7.	Study and implementation of EJB	02

Text Book(s):

Title	Author/s	Publication
Complete Reference J2EE	James Keogh	Mc Graw Hill

Reference Book(s):

Title	Author/s	Publication
Spring in Action 3rd edition	Craig walls	Manning
JDBC™ API Tutorial and Reference	Maydene Fisher, Jon Ellis, Jonathan Bruce	Addison Wesley

Web material link:

- <https://www.javatpoint.com/servlet-tutorial/>
- <https://www.javatpoint.com/jsp-tutorial/>

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Practical:

- Continuous Evaluation consists of the performance of practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 15 marks during End Semester Exam.
- Viva/oral performance consists of 15 marks during End Semester Exam.

Course Outcome(s):

After completion of the course, the students will be able to

- understand Client-Server Architecture.
- design web applications using a servlet, Java Server Pages.
- understand fundamentals of all advance Java concepts.

P P Savani University
School of Engineering

Department of Master of Computer Application

Course Code: SECA7070

Course Name: Computer Network and Cyber Security

Prerequisite Course (s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- To make students understand, network security protocol including firewall.
- The students will be able to know advanced attacking techniques.
- The students will be able to understand cyber security fundamentals.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	UNIT-I Introduction: Layered Network Architecture, ISO- OSI Model, Introduction to TCP/IP Model.; Data Communication Techniques: Pulse Code Modulation (PCM), Differential Pulse Code Modulation (DPCM), Delta Modulation (DM).; Multiplexing Techniques: Frequency Division, Time Division, Statistical Time Division Multiplexing; Transmission Media: Wires, Cables, Radio Links, Satellite Link, Fiber Optic.	04	11
2.	UNIT-II Data Link Layer Protocols AND Medium Access Control Sub Layer Noise Free Channels Protocol: Stop and Wait Protocols, Sliding Window Protocol, Noisy Channels Protocols: Stop and Wait ARQ, Sliding Window ARQ: Go Back and Selective Repeat ARQS, ISDN, Asynchronous Transfer Mode (ATM), ATM cells, Header and Cell Formats, Error Detection And Correction: Single and Burst Error, Parity Check Codes, Cyclic Redundancy Code & Hamming Code, Concept of Random Access, LAN: IEEE 802.3, 802.4 and 802.5 Protocols, Token Ring Protocol, FDDI Protocol, Distributed Queue Dual Bus (DQDB) Protocol.	07	12

3.	<p>UNIT-IV Network and Transport Layer Protocols: General Principles, Virtual Circuits and Data-grams, Windows Flow Control, Packet Discarding, Traffic Shaping, Choke RSVP, Network Devices: Bridges, Routers and Gateways, Routing Algorithms: Optimality principle, Shortest Path Routing- Dijkstra, Distance Vector Routing, Link State Routing, Flow Based Routing, Multicasting Routing, Flooding and Broadcasting, Flow and Congestion Control, Internet Architecture and Addressing, Transport Layer: Design Issues, Quality of Services, Primitives, Connection Management: Addressing, Connection Establishment and Releases, Flow Control and Buffering, Crash Recovery, Protocols: Transmission Control Protocol (TCP), User Datagram Protocol UDP).</p>	08	15
4.	<p>UNIT-V Application Layer Protocols and Other Networks: Cryptography: Substitution and Transposition, Ciphers, Data Encryption Standard (DES), DES Chaining, Breaking DES, Public key Cryptography, Authentication Protocols, Virtual LAN (VLAN), Virtual Private Network (VPN).</p>	03	12
Section II			
1.	<p>UNIT-I Introduction Overview of Public Key Cryptography, Symmetric Cryptography, Digital Signature, Encryption/Decryption Algorithms, Public Key Infrastructure, Internet Key Exchange Protocol</p>	07	21
2.	<p>UNIT-II Network Defense tools Firewalls and Packet Filters: Firewall Basics, Packet Filter Vs Firewall, How a Firewall Protects a Network, Packet Characteristic to Filter, Stateless Vs Stateful Firewalls, Network Address Translation (NAT) and Port Forwarding, the basic of Virtual Private Networks, Linux Firewall, Windows Firewall, Snort: Introduction Detection System</p>	08	21
3.	<p>UNIT-III CYBER SECURITY POLICY CATALOG: Cyber Governance Issues, Internet Names and Numbers, Copyrights and Trademarks, Email and Messaging, Cyber User Issues, Cyber Crime, Geo location, Privacy, Cyber Conflict Issues, Intellectual Property Theft, Cyber Espionage.</p>	08	8

List of Practical:

Sr. No	Name of Practical	Hours
1.	Implementation of basic Client Server program using TCP Socket (Eg. Day time server and client).	06
2.	Implementation of basic Client Server program using UDP Socket	06
3.	Implementation of TCP Client Server program with concurrent connection from clients.	04
4.	Implementing fully concurrent application with a TCP server acting as a directory server and client programs allowing concurrent connection and message transfer (Eg. Chat system).	06
5.	TCP scanning using NMAP	04
6.	Port scanning using NMAP	04

Reference Book(s):

Title	Author/s	Publication
Computer Network: Second Ed.	A.S. Tanenbaum	Prentice Hall, India(tan)
Data Communication	B.A. Frouzan	Tata McGraw Hill.
Anti-Hacker Tool Kit (Indian Edition)	Mike Shema	Mc Graw Hill
Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives	Nina Godbole	Wiley

Web material link:

1. <http://>
2. <https://www.netacad.com/courses/packet-tracer>

Course Evaluation:**Theory:**

- Continuous Evaluation consists of two tests each of 30 marks and 1 hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Practical:

- Continuous Evaluation consists of performance of practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/test consists of 30 marks during End Semester Exam.
- Viva/ Oral performance consists of 30 marks during End Semester Exam.

Course Outcome(s):

- The students will be able to understand the structure and organization of computer networks; including the division into layers, role of each layer, and relationships between the layers.
- The students will have basic understanding of Communication techniques and functioning of physical layer.
- The students will be able to understand the basic concepts of data link layer properties; including the flow control mechanisms.
- The students will be able to understand the basic concepts of application layer protocol design i.e.
- The students will be able to understand the basic concepts of network security concepts; including authentication, integrity and system security design challenges.

P P Savani University
School of Engineering

Master of Computer Application

Course Code: SECA7080

Course Name: Data Structures & Algorithms

Prerequisite Course (s): SECA7010

Teaching & Examination Scheme:

Teaching Scheme(Hours/Week)				Examination Scheme(Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- develop logic building and problem-solving skills.
- learn to optimize programmatic aspect to solve real-time problems.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in%
1.	Introduction Data types – Primitive and Non-primitive, Types of Data Structure Algorithm: characteristics, specifications, Writing Pseudo-code Algorithm vs Program , Analysis of Algorithm, Methods to measure Time and Space Complexity of Algorithm, Asymptotic Notations to represent Time complexity & Space complexity of an algorithm	06	13
2.	Linear Data Structure Array: Representation of arrays, Insert and Delete Operations on Array, Applications of arrays, Stack: Representation of Stack, Operations On Stacks, Applications of Stacks, Polish Expression, Reverse Polish Expression And Their Compilation, Recursion, Tower of Hanoi, Queue: Representation Of Queue, Operations On Queue, Circular Queue, Priority Queue, Array representation of Priority Queue, Double Ended Queue, Applications of Queue, Linked List: Singly Linked List, Doubly Linked list, Applications of linked list.	06	12
3.	Nonlinear Data Structure Tree : Definitions and Concepts, Representation of binary tree, Binary tree traversal, Binary search trees, Heap, AVL trees,2-3 Trees, Applications of Tree, Graph : Matrix Representation Of Graphs, Graph operations , Graph traversal with BFS and DFS,	05	10

	Applications of Graph		
4.	Sorting and Searching Searching algorithms: Sequential and Binary search and its Analysis , Min-Max Problem & its Analysis, Concept of Internal and External Sorting, Sorting methods : Bubble, Insertion, Selection, Heap , Quick and Merge Sort, Analyze each sorting method for Best, Average and worst case	06	15
Section II			
Module No.	Content	Hours	Weightage in%
1.	Greedy Method Basic algorithm and characteristics, Coin change problem, Fractional Knapsack Problem, Job Sequencing with deadline Minimum Spanning tree using Prim's and Kruskal's Algorithm Dijkstra's Single source shortest path algorithm, Measure Complexity of listed Problems	07	15
2.	Dynamic Programming Method Basic algorithm and characteristics, 0/1 Knapsack Problem , Travelling Salesman Problem, Calculate complexity of listed Problems	06	15
3.	Backtracking Method Basic algorithm and characteristics, Solving n-queens problem, Graph coloring, Hamiltonian cycle (TSP)	06	13
4.	String Matching Concept of String Pattern Match , The naive string-matching algorithm , The Rabin Karp algorithm	03	7

List of Practical(s):

Sr.No	Name of Practical	Hours
1.	Implement Insertion and Deletion operation on Array.	02
2.	Implement Stack and Queue operations using Array.	02
3.	Implement Singly and doubly Linked list.	02
4.	Implement Stack and Queue with Linked List.	02
5.	Implement Binary Tree and perform Insert, Delete and Traversal Operations.	02
6.	Implement Graph Traversal Techniques.	02
7.	Implement and Time analysis of Searching Algorithms.	02
8.	Implement and Time analysis of Min-Max problem.	02
9.	Implement and Time analysis of Bubble, Insertion, Selection, Heap Sort, Quick and Merge Sort.	06
10.	Implement Greedy approach for Implementing Dijkstra's Single source shortest path algorithm.	02
11.	Implement solution for 0/1 Knapsack problem using Dynamic Programming approach.	02
12.	Implement Backtracking Method for Solving N-Queen Problem.	02
13.	Implementation of Naïve String matching algorithm and Rabin-Karp algorithm.	02

Text Book(s):

Title	Author/s	Publication
An Introduction to Data Structures with Applications	Jean-Paul Tremblay, Paul G. Sorenson	Tata McGraw Hill
Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein	MIT Press

Reference Book(s):

Title	Author/s	Publication
Design and Analysis of Algorithm	S. Sridhar	Oxford Higher Education
C & Data Structures	P S Deshpande, O. G. Kakde	Charles River Media
Data Structures using C & C++	Yedidyah Langsam, Moshe J. Augenstein, Aaron M. Tenenbaum	Prentice-Hall

Web Material Link:

- <https://nptel.ac.in/courses/106102064/>

CourseEvaluation:**Theory**

- Continuous Evaluation consists of two tests of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination consists of 60 marks.

Practical

- Continuous Evaluation will be cumulative of practical performances, activities, presentations, viva and submissions consisting of 20 marks.
- Practical performance/quiz/test consists of 15 marks during End Semester Exam.
- Viva/Oral performance of 15 marks during End Semester Exam.

CourseOutcome(s):

After completion of the course, the student will be able to

- design and apply appropriate data structures for solving computing problems.
- analyze algorithms and algorithm correctness.
- understand how asymptotic notation is used to provide a rough classification of algorithms.
- design time and space efficient algorithms using different techniques.

P P Savani University
School of Engineering

Master of Computer Application

Course Code: SECA7090

Course Name: Software Engineering

Prerequisite Course (s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	00	02	05	40	60	00	00	50	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- comprehend the key concepts and process of software engineering that are implemented and followed in developing software.
- illustrate and conceptualize the software development life cycle (SDLC) models and agile methodologies.
- make acquainted with project management framework and tools.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	Introduction Software Engineering, Software Components, Software Crisis, Software Engineering Process, Software Process Models - Waterfall Model, Evolutionary Process Model: Prototype and Spiral Model, , Incremental Process model: Iterative approach, Agile Development: Extreme programming, Scrum.	07	15
2.	Software Requirement Engineering & Specification Requirement Engineering Process, Management of User Needs, Developing Use Cases, Building the Requirements Model, Negotiating Requirements; Validating Requirements, Data Flow oriented modeling, SRS, Standards for SRS.	05	10

3.	Design Engineering Design process and design quality, Design concepts, Design model, Architectural styles, User Interface Design: Golden Rules of User Interface Design; User Interface Analysis and Design; Interface Analysis; Interface Design steps, Software Measurement and Metrics: Various Size Oriented Measures: Function Point (FP) Based Measures, Cyclomatic Complexity Measures: Control Flow Graphs.	06	15
4.	Software Testing Testing fundamentals, Testing principles, Test characteristics, White box testing: Basis path testing, Control structure Black box testing: Equivalence partitioning, Boundary value analysis.	05	10
Section II			
1.	Software Project Management An Overview of IT Project Management: Define project, project management framework, The role of project Manager, Systems View of Project Management, Stakeholder management, Project phases and the project life cycle. Case Study: Use of various framework and tools for project management	06	15
2.	Project Scheduling Basic concepts, Basic principles, Relationship between people and effort, Effort distribution, Task network, Scheduling and tracking, Earned value analysis	05	10
3.	Software Risk Management Risk Management: Identify IT Project Risk, Risk Analysis and Assessment, Risk Strategies, Risk Monitoring and Control, Risk Response and Evaluation. Software Reliability: Reliability Metrics, Reliability Growth Modeling.	04	10
4.	System Analysis & Design using UML UML Diagrams (Structure Diagram, Behavior Diagrams (Use case, Activity, State Diagram), Interaction Diagrams, Sequence Diagram, Communication Diagram, Timing Diagram, Interaction Overview Diagram, Case study: Prepare UML diagrams for any system and application.	07	15

List of Tutorials:

Sr. No	Name of Tutorials	Hours
1.	Identify software process model suited for various system and application.	04
2.	Case Study on Agile methodology.	06
3.	SRS structure and documentation.	04
4.	Analysis and designing user interface and design and developing user scenario.	04
5.	Case Study: Prepare Test Cases for system and application.	04
6.	Study and prepare documentation on various framework and tools used in project management.	04
7.	Analysis and design Consider an system and application using various UML diagrams.	04

Reference Book(s):

Title	Author/s	Publication
Software Engineering: A Practitioners Approach.	R.S. Pressman	McGraw Hill.
Software Engineering.	Ian Sommerville	Addition Wesley / Pearson education
Software engineering principles and practice.	Waman S. Jawadekar	Tata McGraw Hill
Software Engineering – A Precise Approach.	Pankaj Jalote	Wiley India
Beginning Agile.	Andrew Stellman, Greene Jennifer	O'Reilly
Beginning Software Engineering	Rods Stephen	WROX

Web material link:

- <https://nptel.ac.in/courses/106105087/>
- https://www.nptelvideos.com/software_engineering/

Course Evaluation:**Theory:**

- Continuous Evaluation consists of two tests each of 30 marks and 1 hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks

Tutorial:

- Continuous Evaluation consists of performance of tutorial will be done on the basis of list of tutorials provided.
- Tutorial consists of 50 marks.

Course Outcome(s):

After completion of the course, the student will be able to

- understand a high-level overview of the software development process.
- identify various process models available for software engineering activities of software engineering like software requirements, software design, software construction, software management, and software quality etc.
- study about agile methodology & practical implementation of different agile methodologies in IT industry.
- learn about the inputs, tools and techniques to get the required project deliverable and product deliverable using knowledge areas of project management.
- understand project management processes to successfully complete project in IT industry.
- understand high level analysis and design of system

Master of Computer Application

Course Code: SECA7920
Course Name: Project-I
Prerequisite Course(s): ---

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
04			04	00	00	50	50	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- identify, analyze and articulate projects with a comprehensive and systematic approach.
- develop creative thinking.
- perform in a team.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	Selection of Title Select a topic of interest to work upon which can be from any domain. After selecting the topic and proposing the title, get approval from the concerned faculty	10	10
2.	Literature Review Study in detail about the topic chosen.	20	10
3.	Project Proposal Prepare the proposal on the aspect of the selected area to work upon.	20	20
4.	Implementation Implementation of the proposal in any of the programming languages	30	40
5.	Report Writing The report must be prepared as per suggested guidelines consisting of Software Engineering, Preamble, Objectives, Scope, Introduction, Conclusions, Recommendations and Annexure.	10	10
6.	Presentation & Question-Answer At the end of the semester, the student/group of students shall give a presentation of their work followed by a viva-voce examination.	10	10

Course Evaluation:

Sr. No	Evaluation Criteria	Marks
1.	Selection of the topic (Within first 20 Days of commencement of semester)	10
2.	Initial Presentation of the topic	10
3.	An actual work carried out.	10
4.	Report writing as per guidelines.	10
5.	Project and report submission	10
6.	Presentation & Question-Answer session.	50
Total		100

Course Outcome(s):

After completion of the course, the students will be able to

- get information about various existing and future technologies.
- learn the technology of choice and apply that knowledge in solving real life problems.
- develop skills to work in a team



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