Syllabus Book

3rd Year B. Tech.
Information Technology

P P Savani University

School of Engineering
Department of Information Technology

Effective from: 2019-20
Authored by: P P Savani University

SCHOOL OF ENGINEERING

TEACHING & EXAMINATION SCHEME FOR THIRD YEAR B.TECH. INFORMATION TECHNOLOGY PROGRAMME

Sem	Course Code	Course Name	Offered By	Teaching Scheme					Examination Scheme						Total
				Contact Hours				Credit	Theory		Practical		Tutorial		
				Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
5	SEIT3010	Software Engineering	IT	3	0	1	4	4	40	60	0	0	50	0	150
	SEIT3022	Embedded Systems	IT	3	2	0	5	4	40	60	20	30	0	0	150
	SEIT3032	Design and Analysis of Algorithms	IT	3	2	0	5	4	40	60	20	30	0	0	150
	SECE3011	Computer Networks	CE	3	2	0	5	4	40	60	20	30	0	0	150
	SECE3500	Seminar	CE	0	2	0	2	2	0	0	50	0	0	0	50
	SEPD3010	Professional Communication & Soft Skills	SEPD	1	2	0	3	2	0	0	50	50	0	0	100
		Elective 1		2	2	0	4	3	40	60	20	30	0	0	150
	SEIT3920	Summer Training	IT	4			0	4	0	0	100	0	0	0	100
				Total				29	27							1000
6	SEIT3041	Web Technology	IT	2	4	0	6	4	40	60	40	60	0	0	200
	SEIT3062	Cryptography & Network Security	IT	3	2	0	5	4	40	60	20	30	0	0	150
	SEIT3050	Application Development using Open Source Technologies	IT	3	4	0	7	5	40	60	40	60	0	0	200
	SECE3031	Data Warehousing & Data Mining	CE	3	2	0	5	4	40	60	20	30	0	0	150
	SEPD3020	Corporate Grooming & Etiquette	SEPD	1	2	0	3	2	0	0	50	50	0	0	100
	SECE3910	Minor Project	CE	3			3	3	0	0	100	100	0	0	200
		Elective II		2	2	0	4	3	40	60	20	30	0	0	150
				Total				33	25							1150

Teaching Scheme
Elective Subjects

Offered in Sem.	Course Code	Course Name	Offered By	Teaching Scheme											Examination Scheme	
				Contact Hours				Credit	Theory		Practical		Tutorial		Total	
				Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE		
5	SECE3511	Programming with .Net	CE	2	2	0	4	3	40	60	20	30	0	0	150	
	SEIT3510	System Analysis and Design	IT	2	2	0	4	3	40	60	20	30	0	0	150	
	SECE3520	Service Oriented Computing	CE	2	2	0	4	3	40	60	20	30	0	0	150	
6	SECE3531	Wireless Network & Mobile Computing	CE	2	2	0	4	3	40	60	20	30	0	0	150	
	SECE3541	Software Testing & Quality Assurance	CE	2	2	0	4	3	40	60	20	30	0	0	150	
	SEIT3531	Image Processing	IT	2	2	0	4	3	40	60	20	30	0	0	150	

CONTENT

Semester 5

Semester 6

Elective Subjects

P P Savani University
School of Engineering

Department of Information Technology

Course Code: SEIT3010
Course Name: Software Engineering
Prerequisite Course(s): Basics of Object-Oriented Programming and UML

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	01	04	40	60	0	0	20	30	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- study the pioneer of Software Development Life Cycle, Development models and Agile Software Development.
- study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
- discuss various software testing issues and solutions in software unit test; integration, regression, and system testing.
- learn the process of improving the quality of software work products.
- gain the techniques and skills on how to use modern software testing tools to support software testing projects.
- expose Software Process Improvement and Reengineering.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Software Engineering** Study of Different Models, Software Characteristics Components, Applications, Layered Technologies, Processes, Methods and Tools, Generic View of Software Engineering, Process Models- Waterfall model, Incremental, Evolutionary process models- Prototype, Spiral, and Concurrent Development Model.	07	15
2.	**Requirements Engineering** Problem Recognition, Requirement Engineering tasks, Processes, Requirements Specification, Use cases, and Functional specification, Requirements validation, Requirements Analysis, Modeling – different types.	06	15

Module No.	Content	Hours	Weightage in %
3.	**Structured System Design** Design Concepts, Design Model, Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design, Alternative architectural designs, Modeling Component level design and its modeling, Procedural Design, Object Oriented Design.	05	05
4.	**User Interface Design** Concepts of UI, Interface Design Model, Internal and External Design, Evaluation, Interaction, and Information Display Software.	02	05
5.	**Planning a Software Project** Scope and Feasibility, Effort Estimation, Schedule and staffing, Quality Planning, Risk management- identification, assessment, control, project monitoring plan, Detailed Scheduling.	03	10
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Quality Assurance** Quality Control, Assurance, Cost, Reviews, Software Quality Assurance, Approaches to SQA, Reliability, Quality Standards- ISO9000 and 9001.	04	10
2.	**Coding and Unit Testing** Programming principles and guidelines, Programming practices, Coding standards, Incremental development of code, Management of code evaluation, Unit testing- procedural units, classes, Code Inspection, Metrics – size measure, complexity metrics, Cyclomatic Complexity, Halstead measure, Knot Count, Comparison of Different Metrics.	07	15
3.	**Testing** Concepts, Psychology of testing, Levels of testing, Testing Process- test plan, test case design, Execution, Black-Box testing – Boundary value analysis – Pairwise testing- state-based testing, White-Box testing – criteria and test case generation and tool support, Metrics – Coverage analysis- reliability.	07	15
4.	**Software Project Management** Management Spectrum, People –Product – Process- Project, W5HH Principle, Importance of Team Management.	02	05
5.	**Case Tools and Study** Introduction to CASE Building Blocks of CASE, Integrated CASE Environment.	02	05

List of Tutorial:

Sr. No.	Name of Tutorial	Hours
1.	To identify the role of the software in today's world across a few significant domains related to day to day life.	01
2.	To identify the problem related to software crisis for a given scenario.	01
3.	To identify the suitable software development model for the given scenario.	01
4.	To identify the various requirement development activities viz. elicitation, analysis, specification and verification for the given scenarios.	01
5.	To identify the various elicitation techniques and their usage for the Banking case study.	01
6.	To classify the requirement into functional and non-functional requirements.	01
7.	Identify the elements in software Requirements Specification document.	01
8.	To verify the requirements against the quality attributes.	01
9.	Identify the elements and relationship by analyzing the class diagram of Shop Retail Application case study.	01
10.	Identify the design principle that is being violated in relation to the given scenario.	01
11.	To identify the usage of stubs or drivers in the context of an integration testing scenario.	01
12.	Identify the different types of performance testing.	01
13.	To identify the usage of regression testing.	01
14.	To understand usage of software metrics.	01
15.	Project Work: Understand importance of SDLC approach & various processes.	01

Text Book(s):

Title	Author/s	Publication
Fundamentals of Software Engineering	Rajib Mall	PHI Learning
Software engineering: A Practitioner's Approach	Roger Pressman	McGraw Hill Education

Reference Book(s):

Title	Author/s	Publication
Software Engineering – An Engineering Approach	James F. Peters & Witold Pedrycz	Wiley
Software Engineering – Principles and Practice	Waman Jawadekar	McGraw Hill Education

Web Material Link(s):

- https://nptel.ac.in/courses/106101061/

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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 student will be able to

- prepare SRS (Software Requirement Specification) document and SPMP (Software Project Management Plan) document.
- apply the concept of functional oriented and object-oriented approach for software design.
- recognize how to ensure the quality of software product, different quality standards, and software review techniques.
- apply various testing techniques and test plan in.

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SEIT3022
Course Name: Embedded Systems
Prerequisite Course(s): Digital Workshop (SECE2021) and Computer Organization (SECE2040)

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 microcontroller architecture and design.
- program microcontroller for a specific task.
- design and build a microcontroller based embedded system.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Computer architecture and the 8051 Microcontroller.** • Computer organization and architecture • The difference between microprocessor and microcontroller • The MCS51 Microcontroller family • The 8051 microcontroller Hardware Structure • Edsim51 software installation and familiarizing	05	10
2.	**Type of Memory of the 8051 Microcontroller.** • Code Memory, Internal and external RAM and ROM • Special Function Registers (SFRs) & Bit Memory • Basic Registers (ACC, Rn, PC, SP and DPTR)	05	10
3.	**Timers and I/O Programming:** • Working of 8051 • TMOD SFRs and TCONSFRs • Initializing and Reading of Timer	04	08
4.	**Arithmetic and Logic Instruction** • Arithmetic Instruction (ADD, ADDC, DA, SUBB, MUL, DIV) • Logic and Compare Instruction • Rotate Instruction and Data serialization • BCD	04	10

5.	**Interfacing of 8051 microcontroller:** • Interfacing into7-Segments; • Interfacing into 4x3 Keypad; • Interfacing into LCD • Interfacing into sensors, ADC and DAC • Interfacing into external memory RAM and ROM	04	12

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Arduino Microcontroller Board** • Introducing the Arduino Board • Installing and familiarizing the Arduino IDE • Project Development with Arduino Uno	08	15
2.	**Interfacing the Arduino Uno into Keypad and 7-Segment** • Connection Diagram • Arduino Program Code	05	11
3.	**Interfacing the Arduino Uno into Keypad and LCD:** • Connection Diagram • Arduino Program Code	05	12
4.	**Interfacing the Arduino Uno into Sensor, and DC-Motor** • Connection Diagram • Arduino Program Code	05	12

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Arduino board introduction and LED	02
2.	Arduino Light Sensor	04
3.	Arduino 7 Segment Display	04
4.	Arduino Distance sensor	04
5.	Arduino DC Motor Control	04
6.	Pir Motion Sensor	04
7.	Arduino Relay connectivity	04
8.	Arduino Temperature sensor	04

Text Book(s):

Title	Author/s	Publication
The 8051 Microcontroller and Embedded Systems: Using Assembly and C.	Mazidi, Muhammad Ali and Mc Kinlay Rolin	Pearson Education
Arduino Cookbook, 2nd Edition	Michael Margolis	O'Reilly Media

Reference Book(s):

Title	Author/s	Publication
Computer Organization and Architecture, 10th Edition	William Stallings	Pearson Education

Web Material Link(s):
- www.keil.com
- http://www.8051projects.net/
- http://www.microcontroller-project.com/
- www.8051project.org/
- https://www.pjrc.com/tech/8051/

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 per each practical and the average of the entire practical will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 15 marks.
- External viva consists of 15 marks.

Course Outcome(s):

After completion of the course, the student will be able to
- analyse the digital logic circuit containing combinatorial and sequential logic system.
- distinguish between microprocessor and microcontroller.
- design an embedded system using a microcontroller.

P P Savani University
School of Engineering

Department of Information Technology

Course Code: SEIT3032
Course Name: Design and Analysis of Algorithms
Prerequisite Course(s): Introduction to Computer Programming (SECE1020), and Data Structures (SECE2031)

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.
- understand how to calculate time complexity and space complexity of any algorithm.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in%
1.	**Fundamental concept of Algorithm Design & Analysis** Algorithm: characteristics, specifications, Writing Pseudo-Code, Frequency count and its importance in analysis of an algorithm, Asymptotic Notations: Time complexity & Space complexity of an algorithm, Big 'O'& 'Ω' notations, Best, Worst and Average case analysis of an algorithm, Analysis of searching algorithms: sequential, binary search, Analysis of sorting methods: bubble, insertion, selection, heap sort, Analysis of each sorting technique for best, worst and average case, Concept of Internal & External sorting.	06	15
2.	**Divide and Conquer Algorithmic Design Method** Divide and conquer: basic algorithm and characteristics, Binary Search: method and analysis of binary search for best, worst and average case for searches, Quick Sort, Merge Sort: method and analysis of algorithms, Finding the largest and smallest number in a list, Matrix Multiplication.	06	15
3.	**Greedy Method** The Greedy Method: basic algorithm and characteristics, Fractional Knapsack Problem solving using greedy method, Optimal merge patterns and optimal storage on tapes, Job	06	10

Module No.	Content	Hours	Weightage in%
	sequencing with deadlines, Huffman Coding: greedy method, Minimum cost spanning trees: Prim's and Kruskal's Algorithm, Single source shortest path.		
4.	**Dynamic Programming Method** Dynamic Programming Method: basic algorithm and characteristics, 0/1 Knapsack Problem solving using DP method, Multistage graphs, Optimal binary search trees, Travelling salesperson problem.	05	10
Section II			
Module No.	Content	Hours	Weightage in%
1.	**Backtracking Method** Backtracking Method: basic algorithm and characteristics, Solving n-queens problem, Sum of subsets problem, Graph coloring, Hamiltonian cycle (TSP).	06	15
2.	**Branch and Bound technique** Branch and bound: basic algorithm and characteristics, solving n-queens using branch & bound, FIFO Branch and Bound & Least Cost Branch & Bound, Least Cost Search, 15-puzzle, Solving Travelling salesperson problem using branch & bound.	08	15
3.	**String Matching** Introduction, The naive string-matching algorithm, The Rabin-Karp algorithm, String Matching with finite automata, The Knuth-Morris-Pratt algorithm.	04	12
4.	**Introduction to NP-Completeness** The class P and NP, Polynomial reduction, NP- Completeness Problem, NP-Hard Problems. Travelling Salesman problem, Hamiltonian problem, Approximation algorithms.	04	08

List of Practical:

Sr No	Name of Practical:	Hours
1.	Implementation and Time analysis of Bubble sort.	02
2.	Implementation and Time analysis of Selection sort.	02
3.	Implementation and Time analysis of Insertion sort.	02
4.	Implementation and Time analysis of Merge sort.	02
5.	Implementation and Time analysis of Quick sort.	02
6.	Implementation and Time analysis of searching algorithm.	04
7.	Implementation of a dynamic programming.	04
8.	Implementation of shortest path algorithm.	02
9.	Implementation of graph traversal technique.	02
10.	Implementation of Minimum Cost Spanning Tree.	02
11.	Implementation of backtracking.	02
12.	Implementation of Rabin-Karp algorithm.	02
13.	Implementation of greedy algorithm.	02

Text Book:

Title	Author/s	Publication
Fundamentals of Computer Algorithms	Ellis Horowitz, Sarataj Sahni, S.Rajasekaran	Universities Press

Reference Book(s):

Title	Author/s	Publication
Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein	PHI Learning
Algorithm Design	Michael Goodrich, Roberto Tamassia.	Wiley Student Edition

Web Material Link(s):
- http://www.personal.kent.edu/~rmuhamma/Algorithms/algorithm.html
- https://nptel.ac.in/courses/106101060

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 per each practical and average of the entire practical will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance consists of 15 marks during End Semester Exam.
- External viva consists of 15 marks in End Semester Exam.

Course Outcome(s):
After completion of this course, the student will be able to
- analyze and design algorithms and to appreciate the impact of algorithm design in practice.
- understand how the worst-case time complexity of an algorithm is computed.
- 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

Department of Computer Engineering

Course Code: SECE3011
Course Name: Computer Networks
Prerequisite Course(s): Operating System (SEIT2031)

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 students to

- understand the concept of data communication.
- understand the concepts and layers of OSI and TCP-IP reference models.
- get familiar with different protocols and network components.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Overview of network and data communication, Data Communications, Computer Networking, Protocols and Standards, types of Network, Network Topology, Protocol hierarchies, and design issues of layers, Interfaces, and services. Reference Model: The OSI reference model, TCP/IP reference model, network standards.	04	10
2.	**Physical Layer** Data and transmission techniques, Multiplexing, Transmission media, Asynchronous Communication, Wireless transmission, ISDN, ATM, Cellular Radio, Switching techniques issues.	07	15
3.	**Data Link Layer** Layer design issues, services provided to network layers, Framing, Error control, and Flow control, Data link control and protocols – Simplex protocol, Sliding window protocol	07	15
4.	**Medium Access Sub Layer** Channel Allocations, Multiple Access protocols- ALOHA, CSMA, CSMA/CD protocols, Collision-free protocols, Limited contention protocols, LAN architectures, IEEE 802 and OSI, Ethernet (CSMA/CD), Bus, Token Ring, DQDB, FDDI, Bridges and recent developments.	05	10

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Network Layer** A network Layer design issue, Routing algorithms, and protocols, Congestion Control Algorithms, Internetworking, Addressing, N/W Layer Protocols and recent developments.	08	20
2.	**Transport Layer** Transport services, Design issues, transport layer protocols, Congestion Control, QOS and its improvement.	06	15
3.	**Application Layer** Client-Server Model, DNS, SMTP, FTP, HTTP, WWW, and recent development	08	15

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Implement Packet Generation having information of packet number (2-dig), Total no of packets (2 dig), & data itself in the packet.	08
2.	Implementation flow control algorithms, CRC, VRC, LRC	06
3.	Implement CSMA/CD between two machines	06
4.	Implement Token ring between 3 machines.	06
5.	Study of switches, Hubs, Routers, and gateway.	04

Text Book(s):

Title	Author/s	Publication
Data Communication and Networking	Behrouz A. Forouzan	Tata McGraw Hill

Reference Book(s):

Title	Author/s	Publication
Computer Networks	Andrew S Tanenbaum	PHI Learning
Data and Computer Communications	William Stallings	Prentice Hall
TCP/IP Illustrated Volume-I	Kevin R. Fall, W. Richard Stevens	Addition Wesley
Internetworking with TCP/IP Volume-I	Douglas E. Comer	PHI

Web Material Link(s):
- http://www.tutorialspoint.com/computer_fundamentals/computer_networking.htm
- https://nptel.ac.in/courses/106105080/
- https://www.udemy.com/new-2016-networking-fundamentals-for-beginners/
- https://www.cisco.com/c/en_in/training-events/training-certifications/certifications.html

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 student will be able to
- be familiar with the basics of data communication.
- be familiar with various types of computer networks.
- understand the concepts of protocols, network interfaces, and performance issues in networks.
- have experience in network tools and network programming.

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE3500
Course Name: Seminar
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	
00	02	00	02	00	00	50	00	00	00	50

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help students to
- understand the current trend or technology.
- aware of future technologies.
- try to learn new technologies and apply them as much as possible.

Outline of the Seminar:

Sr. No.	Seminar Guidelines
1.	Selection of Title
2.	Literature Review
3.	Progress of study
4.	Report Writing
5.	Presentation & Question-Answer

Detailed Guideline(s):

Sr. No.	Content	Hours	Weightage in %
1.	**Selection of Title** Select a topic according to the specialization of students or future technology. After selecting the topic and proposed title, get approval from the concerned faculty.	03	10
2.	**Literature Review** Study of various technology or area to select a topic of the seminar.	06	10
3.	**Progress of study** The students must report the progress/status of their work every fortnight to their respective supervisor.	12	40

4.	**Report Writing** The report must be prepared as per suggested guidelines consisting of Preamble, Objectives, Scope, Introduction, Conclusions, Recommendations and Annexure.	06	10
5.	**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.	03	30

Course Evaluation:

Sr. No.	Evaluation criteria	Marks
1.	Selection of the topic related field (Within first 30 Days of commencement of semester)	20
2.	Initial Presentation of the topic (Within 31 to 40 Days of commencement of semester)	20
3.	An actual study carried out (Within 41 to 60 Days of commencement of semester)	20
4.	Report writing as per guidelines	20
5.	Final Presentation & Question-Answer session	20
	Grand Total:	**100**

The entire evaluation will be converted equivalent to 50 Marks.

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.
- apply knowledge in the field.

P P Savani University
School of Engineering

Centre for Skill Enhancement & Professional Development

Course Code: SEPD3010
Course Name: Professional Communication & Soft Skills
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	
1	2	0	2	0	0	50	50	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to
- understand the multifaceted professional speaking process.
- learn the writing etiquettes for professional purposes
- gain basic knowledge, skills and the right attitude to succeed in the future professional working environment.
- develop confidence, enhance their professional communication ability in civilized, harmonized manner.
- sharpen communication skills with reference to organizational structure
- expose themselves to the modern modes of communication

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Self-Management & Career Building** • Self-Evaluation, discipline, and criticism • SWOT analysis to identify personal strength/ weakness • Planning & Goal Setting • MBTI test for self-analysis • Profiling on Online Platforms	01	07
2.	**Interpersonal Organizational Communication** • Interpersonal Behavioral Skills • Understanding empathy and comprehend other's opinions/ points of views, Managing Positive and negative emotions • Healthy and Unhealthy expression of emotions. • Mutuality, Trust, Emotional Bonding and handling situation in interpersonal relationship	04	25

3.	**Professional Communication (Speaking) - I** • Professional Communication and Rhetorics • Art of Telephonic Conversation • Public Speaking	03	18

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Professional Communication (Speaking) – II** • Group Discussion (Concept, importance, Methods, Dos and Don'ts, Paralinguistic and Nonverbal Etiquettes) • Personal Interview (Concept, Importance, Methods, Dos and Don'ts, Type, Paralinguistic and Nonverbal Etiquettes)	03	20
2.	**Professional Communication (Writing)** • Cover Letter and Resume Building • Email writing • Report Building • Technical/ Academic Writing (Reference/ citation/ plagiarism)	04	30

List of Practical:

Sr. No.	Name of Practical	Hours
1.	SWOT Analysis & Profiling	04
2.	MBTI Test	02
3.	Interpersonal Organizational Communication	02
4.	Group Discussion	04
5.	Personal Interview	04
6.	Cover Letter and Resume	06
7.	Email and Report Writing	04
8.	Technical Academic Writing	04

Reference Book(s):

Title	Author/s	Publication
Professional Communication	Sheekha Shukla	2010, WordPress
Professional Communication Skills	Rajesh Kariya	Paradise Publication, Jaipur
Soft Skills and Professional Communication	Petes S. J., Francis.	Tata McGraw-Hill Education, 2011
Effective Communication and Soft Skills	Nitin Bhatnagar	Pearson Education India
Behavioural Science: Achieving Behavioural Excellence for Success	Dr. Abha Singh	John Wiley & Sons, 2012
The Hard Truth about Soft Skills	Klaus, Peggy, Jane Rohman & Molly Hamaker	London: Harper Collins

Course Evaluation:
Practical:
- 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.

Course Outcome(s):
After completion of the course, the student will be able to
- understand the importance of self-analysis for career building.
- learn tactics of communication in professional/ organizational ambiance.
- master the art of conversation and public speaking
- expose themselves for placement processes
- develop writing etiquettes pertaining to placement and organizational context

P P Savani University
School of Engineering

Department of Information Technology

Course Code: SEIT3910
Course Name: Summer Training
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	
00	00	00	02	00	00	100	00	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to
- have first-hand experience the real time situations in industrial scenario.
- get familiar with engineering applications in industrial spectrum
- learn to adapt themselves in professional scenario

Outline of the Course:

Sr. No	Content
1.	Selection of Companies
2.	Company Information collection
3.	Report Writing
4.	Presentation & Question-Answer

Course Evaluation:

Sr. No.	Evaluation criteria	Marks
1	Actual work carried & Report Submission	50
2	Final Presentation & Question-Answer session	50
	Grand Total:	**100**

Course Outcome(s):
After completion of the course, the student will be able to
- apply their theoretical knowledge into reality.
- learn to adapt the workplace situations when they will be recruited.
- be prepared for the real world situations in their future.

Report Writing Guidelines

A. Report Format:
1. Title Page (to be provided by the respective supervisor)

The title page of the project shall give the following information in the order listed:
- Full title of the project as approved by the Mentor;
- The full name of the student/Group of students with enrollment number;
- The qualification for which the project is submitted;
- The name of the institution to which the project is submitted;
- The month and year of submission.

2. Project Certification Form

   [The form should be duly filled signed by the supervisors.]
3. Acknowledgements

   [All persons (e.g. supervisor, technician, friends, and relatives) and organization/authorities who/which have helped in the preparation of the report shall be acknowledged.]
4. Table of Contents/Index with page numbering
5. List of Tables, Figures, Schemes
6. Summary/abstract of the report.
7. Introduction/Objectives of the identified problem
8. Data Analysis and Finding of Solution
9. Application of the identified solution
10. Future Scope of enhancement of the Project and Conclusion
11. "Learning during Project Work", i.e. "Experience of Journey during Project Duration"
12. References(must)
13. Bibliography
14. Annexures (if any)

B. Guideline for Report Formatting:
- Use A4 size page with 1" margin all sides
- Header should include Project title and footer should contain page number and enrollment numbers
- Chapter Name should be of Cambria font, 20 points, Bold
- Main Heading should be of Cambria font, 14 points, Bold
- Sub Heading should be of Cambria font, 12 points, Bold
- Sub Heading of sub heading should be of Cambria font, 12 points, Bold, Italic
- Paragraph should be of Cambria font, 12 points, no margin at the start of the paragraph
- Line spacing for all content – 1.15, before - 0, after - 0
- No chapter number for references
- Before chapter 1, give page numbers in roman letter

P P Savani University
School of Engineering

Department of Information Technology

Course Code: SEIT3041
Course Name: Web Technology
Prerequisite Course(s): Introduction to Web Designing (SEIT1010)

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
02	04	00	04	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 basic of PHP.
- understand working knowledge of dynamic web site design.
- Learn the use cookies and sessions.
- understand how to work with form data.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to PHP** Client-Server Model, Scripting Languages vs. Programming Language, PHP, MySQL, WAMP/XAMPP installation, Usage of PHP in IT industry. Evaluation of PHP, Basic Syntax, Defining variable and constant, Data type, Operator and Expression.	04	08
2.	**Decisions and loop** Making Decisions, Doing Repetitive task with looping, Mixing, Decisions, and looping.	03	12
3.	**Function** What is a function, define a function, Call by value and Call by reference, Recursive function, PHP include () and require (), String, Creating and accessing, String Searching & Replacing String, Formatting String, String, Related Library function?	04	15
4.	**Array** Anatomy of an Array, creating an index based and Associative array Accessing array, Element Looping with Index based array, looping with associative array using each () and foreach (), Some useful Library function.	04	15

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Handling Html form with PHP** Capturing Form, Data Dealing with Multi-value filed, and Generating File uploaded form, redirecting a form after submission. Working with file and Directories: Understanding file& directory, Opening, and closing, a file, Coping, renaming and deleting a file, working with directories, Creating and deleting the folder, File Uploading & Downloading.	06	20
2.	**Session and Cookie** Introduction to Session Control, Session Functionality, Cookies, Setting Cookies with PHP. Using Cookies with Sessions, Deleting Cookies, Registering Session variables, Destroying the variables and Session.	04	10
3.	**Database Connectivity with MySql** Introduction to RDBMS, Connection with MySql Database, performing basic database operation (DML- Insert, Delete, Update, Select), Setting query parameter, Executing query-Join (Cross joins, Inner joins, Outer Joins, Self-joins.)	05	20

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to PHP.	02
2.	Basics of PHP • Data Types • Operators • Conditional Statements • Loops	08
3.	Implementation of functions • Types of functions	08
4.	Implementation of Arrays	06
5.	Implementation of forms. • Validation	04
6.	Implementation of file operations • Creation of file, open, read, write	06
7.	Implement of string functions.	02
8.	Implementation of cookies. • Create, modify, delete	08
9.	Implementation of session • Start, get values, modify values, destroy	06
10.	Implementation of database connectivity.	06
11.	Create an application.	04

Text Book(s):

Title	Author/s	Publication
Learning PHP, MySQL & JavaScript	Michele Davis, Jon Phillips	O' Reilly Media

Reference Book(s):

Title	Author/s	Publication
PHP for the Web: Visual QuickStart Guide	Larry Ullman	Peachpit Press.
PHP, MySQL, and Apache All in One	Juliea C. Meloni	SAMS series, Pearson Education

Web Material Link(s):
- https://www.lynda.com/PHP-training-tutorials/282-0.html
- https://www.w3schools.com/php/php_ref_overview.asp

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 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks during End Semester Exam.
- External viva consists of 30 marks in End Semester Exam.

Course Outcome(s):

After completion of the course, the student will be able to
- understand the structure of open source technologies.
- gain the PHP programming skills needed to successfully build interactive, data-driven sites.
- work with form data.

P P Savani University
School of Engineering

Department of Information Technology

Course Code: SEIT3062
Course Name: Cryptography & Network Security
Prerequisite Course(s): Computer Network (SECE3011) and Mathematical Methods for Computation (SESH2051).

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 cryptography theories, algorithms and systems.
- understand necessary approaches and techniques to build protection mechanisms in order to secure computer networks.

Course Content:

Section – I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Symmetric Cipher Model, Cryptography and Cryptanalysis, Types of Security, Security Services, Security Attacks and Security Mechanisms, Substitution and Transposition techniques.	02	05
2.	**Classical Encryption Techniques** Substitution Ciphers, Permutation/Transposition Ciphers, PlayFair and Hill Ciphers, Polyalphabetic Ciphers, OTP and Machine Ciphers.	03	05
3.	**Mathematics of Cryptography 1** Integer arithmetic, modular arithmetic.	02	05
4.	**Stream Ciphers and Block Ciphers** Stream ciphers and block ciphers, Block Cipher structure, Data Encryption standard (DES) with example, strength of DES, Design principles of block cipher, AES with structure, its transformation functions, key expansion, example and implementation.	05	10
5.	**Multiple Encryption and Triple DES** Multiple encryption and triple DES, Electronic Code Book, Cipher Block Chaining Mode, Cipher Feedback mode, Output Feedback mode, Counter mode.	02	05

Module No.	Content	Hours	Weightage in %
6.	**Mathematics of Cryptography 2** Algebraic Structures, GF (2^n) fields.	02	05
7.	**Public Key Cryptosystems** Public Key Cryptosystems with Applications, Requirements and Cryptanalysis, RSA algorithm, its computational aspects and security, Diffie-Hillman Key Exchange algorithm, Man-in-Middle attack.	04	10
8.	**Key Management and Distribution** Key management and distribution, symmetric key distribution using symmetric and asymmetric encryptions, distribution of public keys, X.509 certificates, Public key infrastructure.	02	05

Section – II			
Module No.	Content	Hours	Weightage in %
1.	**Cryptographic Hash Functions** Cryptographic Hash Functions, their applications, Simple hash functions, its requirements and security, Hash functions based on Cipher Block Chaining, Secure Hash Algorithm (SHA).	05	05
2.	**Message Authentication Codes** Message Authentication Codes, its requirements and security, MACs based on Hash Functions, Macs based on Block Ciphers.	02	05
3.	**Digital Signature, its properties** Digital Signature, its properties, requirements and security, various digital signature schemes (Elgamal and Schnorr), NIST digital Signature algorithm.	02	05
4.	**Remote User Authentication with Symmetric and Asymmetric Encryption** Remote user authentication with symmetric and asymmetric encryption, Kerberos.	02	05
5.	**Network Security** What is Network Security? Introduction to TCP/IP protocol stack, Security at various layers of TCP/IP, Types of Network Attacks: Active Attacks and Passive Attacks.	02	05
6.	**Firewalls and Web Security** Packet filters, Application level gateways, Encrypted tunnels, Cookies, Web security problems.	02	05
7.	**Application Layer Security** Electronic Mail Security: Distribution lists, Establishing keys, Privacy, source authentication, message integrity, non-repudiation, proof of submission, proof of delivery, message flow confidentiality, anonymity, Pretty Good Privacy (PGP).	02	05
8.	**Security at Network Layer** SSL and TLS. IPSec, AH, ESP, IKE.	04	10
10.	**Advanced Topics** Intruders, Virus, Trojans, Malware, Ransomware.	02	05

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Write a program to implement Ceaser cipher.	02
2.	Write a program to implement the Playfair cipher.	02
3.	Write a program to implement the columnar transposition cipher.	02
4.	Write a program to implement rail fence transposition cipher.	02
5.	Write a program to implement Vernam cipher.	02
6.	Write a program to implement n-gram Hill Cipher.	02
7.	Write a program to implement the Vigenere Cipher.	02
8.	Write a program that implements the Extended Euclidean Algorithm to find inverse of a given number in the Galois field.	02
9.	Write a program to implement DES Cipher.	04
10.	Write a program to implement AES Cipher.	04
11.	Write a program to implement RSA Cryptosystem.	04
12.	Demonstration of Wireshark for Packet Capturing.	02

Text Book(s):

Title	Author/s	Publication
Cryptography and Network Security: Principles and Practice, 5/e	William Stallings	Prentice Hall

Reference Book(s):

Title	Author/s	Publication
Cryptography and Network Security	Behrouz A. Forouzan	McGraw-Hill Education
Network Security: Private Communications in a Public World, 2nd Edition	Charlie Kaufman, Radia Perlman and Mike Speciner	Prentice Hall
Handbook of Applied Cryptography	Alfred J. Menezes, Jonathan Katz, Paul C. van Oorschot, Scott A. Vanstone	CRC Press
Computer Security, 3/e	Dieter Gollmann	Wiley

Web Material Link(s):
- http://ggu.ac.in/download/Class-Note14/public%20key13.02.14.pdf
- https://onlinecourses.nptel.ac.in/noc19_cs28/preview

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 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 student will be able to
- learn the concepts related to applied cryptography, including plaintext, cipher text, symmetric cryptography, asymmetric cryptography, and digital signatures.
- learn the theory behind the security of different cryptographic algorithms.
  learn common network vulnerabilities and attacks, defense mechanisms against network attacks, and cryptographic protection mechanisms.

P P Savani University
School of Engineering

Department of Information Technology

Course Code: SEIT3050
Course Name: Application Development using Open Source Technologies.
Prerequisite Course(s): Requires Basic knowledge of programming

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 Object Oriented Programming concepts.
- make students aware about the importance of practically oriented approach.
- develop the ability of students for implementing real-life programming problems.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Installation and Working with Python, Understanding Python variables, Python basic Operators, Understanding python blocks.	04	08
2.	**Python Data Types** Declaring and using Numeric data types: int, float, complex, using string data type and string operations, defining list and list slicing, Use of Tuple data type.	05	12
3.	**Python Program Flow Control** Conditional blocks using if, else and else if, Simple for loops in python, for loop using ranges, string, list and dictionaries Use of while loops in python, Loop manipulation using pass, continue, break and else Programming using Python conditional and loops block.	05	12
4.	**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.	06	12

Module No.	Content	Hours	Weightage in %
5.	**Python String, List and Dictionary Manipulation** Building blocks of python programs, understanding string in build methods, List manipulation using in build methods, Dictionary manipulation, Programming using string, list and dictionary in build functions.	03	06

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Python Object Oriented Programming** Oops Concept of class, object and instances, Constructor, class attributes and destructors, Real-time use of class in live projects, Inheritance, overlapping and overloading operators, Adding and retrieving dynamic attributes of classes.	04	08
2.	**Databases** SQL Database connection using python, Creating and searching tables, Reading and storing information on the database, Programming using database connections.	08	18
3.	**Python Regular Expressions** Powerful pattern matching and searching Power of pattern searching using regex in python, Real-time parsing of networking or system data using regex, Password, email, URL validation using a regular expression, Pattern finding programs using a regular expression.	06	14
4.	**Exception Handling** Basics of Exception handling, Exception handling mechanism, throwing mechanism, caching mechanism.	04	10

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to Python Environment	02
2.	Input and Output in Python	02
3.	Working with different Data types in Python	06
4.	Implementation of Dictionaries, Sets, Tuples	06
5.	Implementation of Lists	04
6.	Implementation of flow controls statements	06
7.	Working Strings in Python	04
8.	Working with functions and modules	06
9.	Implementation of OOP features	06
10.	Database connectivity	06
11.	Regular Expression	06
12.	Exception Handling	06

Text Book(s):

Title	Author/s	Publication
Python Programming: A modular approach	Sheetal Taneja,Naveen Kumar	Pearson
Think Python: How to Think Like a Computer Scientist	Allen Downey	Green Tea Press

Reference Book(s):

Title	Author/s	Publication
Python Cookbook	David Ascher, Alex Martelli	Oreilly

Web Material Link(s):
- https://teamtreehouse.com/learn/python
- https://www.tutorialspoint.com/python/
- https://www.w3schools.com/python/

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 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/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
- understand the syntax and semantics of Python language.
- develop efficient programs with their own logic & capabilities.
- learn the fundamentals of Object-Oriented programming.
- learn and develop a small application.

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE3031
Course Name: Data Warehousing & Data Mining
Prerequisite Course(s): Database Management System (SECE2011)

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
- identify the key processes of data mining as part of the knowledge discovery process.
- discover the knowledge imbibed in the high dimensional system.
- apply data mining techniques to solve real-time problems.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Motivation and Importance, Different kinds of Data, Data Mining Functionalities, Classification of data mining systems, Major issues in Data Mining.	03	10
2.	**Data Pre-processing** Overview, need for pre-processing, Issues related to efficient data handling (Extraction, Transformation, And updating of large databases), Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy.	08	15
3.	**Data Warehouse and OLAP Technology** Multidimensional data model, Data warehouse Architecture, Data warehouse implementation, Efficient methods for data cube computation, Attributes Oriented Induction.	06	15
4.	**Mining Frequent Patterns, Associations and Correlations** Basic concept, Efficient and scalable frequent itemset mining methods, Mining Association Rules, Association Mining to Correlation Analysis, Constraint-Based Association mining.	05	10

	Section II		
Module No.	Content	Hours	Weightage in %
1.	**Classification** Introduction, Issues regarding classification, Classification by decision tree induction, Bayesian classification, rule-based classification, classification by back propagation, support vector machines, associative classification, lazy learners.	06	16
2.	**Prediction** Classification vs. prediction, issues of prediction, linear regression, nonlinear regression, accuracy and error measures, evaluation of the accuracy of a classifier or predictor, ensemble methods.	06	14
3.	**Cluster Analysis** Types of data in cluster analysis, a categorization of major clustering methods, partitioning methods, hierarchical methods, density-based methods, grid-based methods, model-based clustering methods, clustering high dimensional data, outlier analysis.	11	20

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to data mining tool: Weka	04
2.	Solve classification problems using WEKA	04
3.	Solve clustering problems using WEKA	04
4.	Introduction to data mining tool: XL Miner	02
5.	Introduction to data mining tool: Rapid Miner	02
6.	Introduction to data mining tool: Orange	02
7.	Introduction to data mining tool: R	02
8.	Introduction to data mining tool: Knime	02
9.	Introduction to data mining tool: Tanagra	02
10.	Tools to create different data warehouse schemas	06

Text Book(s):

Title	Author/s	Publication
Data Mining Concepts and Techniques	Jiawei Han, Micheline Kamber Jian Pei	Elsevier

Reference Book(s):

Title	Author/s	Publication
Data Mining	Arun K. Pujari	University Press
Data Warehousing Fundamentals	Paulraj Ponnian	John Willey & Sons
Introduction to Data Mining	Tan, Steinbach, Karpatne, Kumar	Addison-Wesley

Web Material Link(s):
- https://www.cs.waikato.ac.nz/ml/weka
- https://ocw.mit.edu/courses/sloan-school-of-management/15-062-data-mining-spring-2003/
- https://www.tutorialspoint.com/dwh/dwh_data_warehousing.htm

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 per each practical and the average of the entire practical will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 15 marks.
- External viva consists of 15 marks during End Semester Exam.

Course Outcome(s):
After completion of the course, the student will be able to
- learn to discover interesting patterns from large amounts of data to analyze predictions and classification.
- understand warehousing architectures and tools for systematically organizing data and use the data to make strategic decisions.
- develop a data mining application for data analysis using various tools.

Centre for Skill Enhancement & Professional Development

Course Code: SEPD3020
Course Name: Corporate Grooming & Etiquette
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	00	00	50	50	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- learn corporate and professional structure and mannerisms.
- acquire self-development skills to balance casual and formal situation.
- polish their personal skills for apt behavior in the context of corporate structure.
- develop adequate Skill set required for the workplace.
- become aware of the professional etiquettes and tactics to follow them.

Course Content:

Section – I			
Module No.	Content	Hours	Weightage in %
1.	**Corporate Grooming** • Introduction to corporate culture • Corporate Expectations • Need of Self-Grooming to the Corporate Expectations • Understanding and importance of Professionalism	03	25
2.	**Personal Skills** • Behavioral skills • Language Skills • Knowledge Skills • Problem Solving Skills • Developing professional attitude	04	25
Section – II			
Module No.	Content	Hours	Weightage in %
1.	**Management Skills** • Self-management • Time management • Work-life balance	04	25

2.	**Organizational Etiquettes** • General Workplace Etiquettes • Presentation Etiquettes • Meeting Etiquettes	04	25

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Corporate Grooming (Video session/ Role Play/ Skit)	04
2.	Personal Skills (Games/ Quiz/ Activities)	08
3.	Management Skills (Management Activities/ Video Sessions)	06
4.	Organizational Etiquettes (Case Study/ Activities/ Video Sessions)	06
5.	Computer Assisted Activities of Corporate Grooming	06

Reference Book(s):

Title	Author/s	Publication
Grooming and Etiquette for Corporate Men and Women	John Chibaya Mbuya, Bulelwa Monica Maphela	Lambert Academic Publishing
Effective Communication Skills for Public Relations	Andy Green	Kogan Page Ltd.
Personality Development and Soft Skills	Barun Mitra	Oxford University Press, 2016
The EQ Edge: Emotional Intelligence and Your Success	Stein, Steven J. & Howard E. Book	Jossey-Bass,3rd Edition 2011.
Cross Cultural Management: Concepts and Cases	Shobhana Madhavan	Oxford University Press, 2016
Corporate Grooming and Etiquette	Sarvesh Gulati	Rupa Publications India Pvt. Ltd., 2012
Behavioral Science: Achieving behavioral Excellence for Success	Dr. Abha Singh	Wiley & Sons, 2012

Course Evaluation:

Practical

• Continuous Evaluation consists of the performance of practical to be evaluated out of 10 marks for each practical and average of the same will be converted to 30 marks.
• Internal viva consists of 20 marks.
• Practical performance/quiz/drawing/test/submission consists of 25 marks during End Semester Exam.
• Viva/oral performance consists of 25 marks during End Semester Exam.

Course Outcome(s):

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

• understand the importance of professional etiquettes and ways to improve the same.
• gain the knowledge and practice of skill sets required in corporate set up.
• learn personal management skills in the organizational context.
• develop an awareness about the corporate etiquettes.

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE3910
Course Name: Minor Project
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	
00	03	00	03	00	00	100	100	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help students to
- understand the current trend or technology.
- aware of future technologies.
- try to learn new technologies and apply them as much as possible.

Outline of the Seminar:

Sr. No.	Seminar Guidelines
1.	Selection of Title
2.	Literature Review
3.	Gap Identification
4.	Proposed Scheme
5.	Implementation of the proposal
6.	Report Writing
7.	Presentation & Question-Answer

Detailed Guideline(s):

Sr. No.	Content	Hours	Weightage in %
1.	**Selection of Title** Select a topic according to the specialization of students or future technology. After selecting the topic and proposed title, get approval from the concerned faculty.	06	10
2.	**Literature Review** Study of various technology or area to select a topic of the seminar.	12	10
3.	**Gap identification and Proposal** Students must identify the gaps in the existing research and design a proposal which will help in overcome the same.	10	40

4.	**Implementation** Students must implement their proposal in any of the programming languages.	08	20
5.	**Report Writing** The report must be prepared as per suggested guidelines consisting of Preamble, Objectives, Scope, Introduction, Conclusions, Recommendations and Annexure.	04	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.	05	10

Course Evaluation:

Sr. No.	Evaluation criteria	Marks
1.	Selection of the topic related field (Within first 30 Days of commencement of semester)	40
2.	Initial Presentation of the topic (Within 31 to 40 Days of commencement of semester)	40
3.	An actual work carried out (Within 41 to 60 Days of commencement of semester)	40
4.	Report writing as per guidelines	40
5.	Final Presentation & Question-Answer session	40
	Grand Total:	**200**

The entire evaluation will be converted equivalent to 200 Marks.

Course Outcome(s):

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

- get information about various existing and future technologies.
- learn the technology of choice.
- apply knowledge in the field.

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE3511
Course Name: Programming with .NET
Prerequisite Course(s): Introduction to Computer Programming (SECE1020)

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
02	02	00	03	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 .NET framework and its applications.
- understand the basics of C#.
- understand ASP.NET web services and web service security.

Course Content:

Section – I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to .NET Framework** .NET Overview, NET framework, course mechanics, CLR, Assemblies (monolithic vs. component-based applications), Execution Model, Client-Side vs. Server-Side Programming.	05	16
2.	**Basics and Console Applications in C#** Name Spaces, Constructors, Destructors, Function Overloading, Inheritance, Operator Overloading, Modifier Properties, Indexers, Attributes, Reflection API, Console Applications, Generating Console Output, Processing Console Input.	05	16
3.	**C#.NET** Language Features and Creating .NET Projects, Namespaces Classes and Inheritance, Namespaces Classes and Inheritance, C, Exploring the Base Class Library, Debugging and Error Handling, Data Types, Exploring Assemblies and Namespaces, String Manipulation, Files and I/O, Collections.	05	18

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Windows Forms and Controls in details** The Windows Forms Model, Creating Windows Forms Windows Forms Properties and Events, Windows Form Controls, Menus, Dialogs, Tool Tips, Printing - Handling Multiple Events, GDI+, Creating Windows Forms Controls.	04	14
2.	**ASP.NET** Introduction to ASP.NET, Working with Web and HTML Controls, Using Rich Server Controls, Login controls, Overview of ASP.NET Validation Controls, Using the Simple Validations, Using the Complex Validators Accessing Data using ADO.NET, Using the Complex Validators Accessing Data using ADO.NET, Configuration Overview, ASP.NET state management, tracing, caching, error handling, security, deployment.	04	12
3.	**Managing State** Preserving State in Web Applications and Page-Level State, Using Cookies to Preserve State, ASP.NET Session State, Storing Objects in Session State, Configuring Session State, Setting Up an Out-of-Process State Server, Storing Session State in SQL Server, Using Cookieless Session IDs, Application State Using the DataList and Repeater Controls, Overview of List-Bound Controls, Creating a Repeater Control and DataList Control.	07	24

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to .NET.	04
2.	Working with .NET and C#.	02
3.	Write C# code to convert infix notation to postfix notation.	02
4.	Write a C# code to convert the following currency conversion. Dollar to Rupee, Euro to Rupee, Pound to Rupee.	02
5.	Working with ASP.NET.	02
6.	Write a program to Enable-Disable Textbox and change the width of Textbox programmatically in ASP.NET.	02
7.	Write a program to increase and decrease the font size.	02
8.	Session and Cookie.	04
9.	Write ASP.NET program to Store Objects in Session State and Storing Session State in SQL Server.	04
10.	Write a C# code to Perform Celsius to Fahrenheit Conversion and Fahrenheit to Celsius conversion.	02
11.	Simple Object Access Protocol (SOAP) and Web Services.	04

Text Book(s):

Title	Author/s	Publication
Professional C#4.0 and .Net 4	Christian Nagel, Bill Evjen, Jay Glynn, K. Watson, M. Skinner	Wrox Publication
C# The Basics	Vijay Mukhi.	BPB Publications

Reference Book(s):

Title	Author/s	Publication
ASP.NET Complete Reference.	Matthew Macdonald and Robert Standefer	McGraw Hill Education

Web Material Link(s):
- https://teamtreehouse.com/learn/csharp
- https://www.asp.net/aspnet/videos
- https://www.asp.net/web-forms/videos/aspnet-35

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 student will be able to
- use .NET framework architecture, various tools, and validation techniques, use of different templates available in Visual Studio, implementation and testing strategies in real-time applications.
- understand the development and deployment cycles of enterprise applications.

P P Savani University
School of Engineering

Department of Information Technology

Course Code: SEIT3510
Course Name: System Analysis and Design
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	
02	02	00	03	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to
- gather data to analyze and specify the requirements of a system.
- build general and detailed models that assist programmers in implementing a system.

Course Content:

Section – I			
Module No.	Content	Hours	Weightage in %
1.	**Data and Information** Types of information – operational, tactical, strategic and statutory, why do we need information systems? management structure, requirements of information at different levels of management.	05	16
2.	**Systems Analysis and Design Life Cycle** Requirements determination, requirements specifications, feasibility analysis, final specifications, hardware and software study, system design, system implementation, system evaluation, system modification. Role of systems analyst, attributes of a systems analyst, tools used in system analysis.	05	16
3.	**Information gathering** Strategies, methods, case study, documenting study, system requirements specification – from narratives of requirements to classification of requirements as strategic, tactical, operational and statutory.	05	18

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Feasibility analysis** Deciding project goals, examining alternative solutions, cost, benefit analysis, quantifications of costs and benefits, payback period, system proposal preparation for managements, parts and documentation of a proposal, tools for prototype creation.	04	14
2.	**Tools for systems analysts** Data flow diagrams, case study for use of DFD, good conventions, leveling of DFDs, leveling rules, logical and physical DFDs, software tools to create DFDs.	04	12
3.	**Data oriented systems design** Entity relationship model, E-R diagrams, relationships cardinality and participation, normalizing relations, various normal forms and their need, some examples of relational data base design.	04	14
4.	**Structured systems analysis and design** Procedure specifications in structured English, examples and cases, decision tables for complex logical specifications, specification-oriented design vs procedure-oriented design.	03	10

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Prepare a Context level DFD diagram and as many sublevel DFDs by identifying the processes, the entities and arrows to show how the information is passed from one process to another.	06
2.	Prepare a Data Flow Diagram that is drawn for a Food Ordering System. It should contain a process that represents the system. It should also show the participants who will interact with the system	06
3.	Prepare an E-R Diagram showing the relationships one-to-one, one-to-many and many-to-many listing assumptions to justify your answer.	06
4.	The owner is thinking to add a 24-automated rental machine to facilitate his customers to rent any movie at any time of the day, 365 days of the year but before taking his decision he would like to see the response of his customers of how much they would welcome such a facility. As a systems analyst you currently do not have any customer response and you are required to prepare a questionnaire of your own choice i.e. open, closed, bipolar, etc. to gather a fair customer response regarding a24-automated rental machine.	06
5.	Case Study on feasibility analysis.	06

Text Book(s):

Title	Author/s	Publication
System Analysis and Design	Allen Dennis, Barbara Haley Wixom, Roberta M. Roth	Wiley
Modern System Analysis and Design	Jeffery A. Hoffer, Joey F. George, Joseph H. Valacich, Prabin K. Panigrahi	Pearson

Reference Book(s):

Title	Author/s	Publication
System Analysis and Design Methods	Jeffery L. Whitten, Lonnie D. Bentley.	McGraw Hill Education

Web Material Link(s):
- https://nptel.ac.in/courses/106108102/
- https://www.oreilly.com/library/view/systems-analysis
- https://www.w3computing.com/systemsanalysis/

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 student will be able to
- analyze business problems and develop a requirements document, written in clear and concise business language.
- present this document to a business audience.

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE3520
Course Name: Service Oriented Computing
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	
02	02	00	03	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to
- explain the underlying principles of Service Oriented Architecture.
- describe and understand different terminologies used in Service Oriented Architecture.
- apply the different concepts of SOA to build different applications.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Fundamental SOA, Characteristics of contemporary SOA, Misperception timeline, Continuing evolution of SOA, Roots of SOA Service-orientation and object-orientation, Web Services, Key Principles of SOA.	03	10
2.	**Enterprise architectures** Integration versus interoperation, J2EE, .NET, Model Driven Architecture, Concepts of Distributed Computing, XML.	04	20
3.	**Basic Concepts** Web services framework, Services (Web services: Definition, Architecture, and standards), Service descriptions with WSDL, Messaging with SOAP, UDDI.	08	20
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Principles of Service-Oriented Architecture** Message Exchange Pattern, Coordination, Atomic Transactions, Business Activities, Orchestration, Choreography, WS-Addressing, WS-Reliable Messaging, WS-Policy (including WS-Policy Attachments and WS-Policy Assertions), WS-Metadata	07	20

	Exchange, WS-Security (including XML-Encryption, XML-Signature, and SAML).		
2.	**Principles of Service-Oriented Computing** RPC versus Document Orientation, Service Life Cycle, Service Creation, Service Design and Build, Service Deployment, Publish Web service using UDDI, Service Discovery, Service Selection, Service Composition, Service Execution, and Monitoring, Service Termination.	08	30

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Develop DTD and XSD for University Information System having Exam Enrollment from the beginning of Semester, along with Exam Registration and Marks submission by Teachers to University from Various Colleges and Results in Sheets Generation by University on Online Report.	02
2.	Develop Mark sheet XML Document and display Mark sheet based on CSS and XSL presentation Format.	04
3.	Develop Java Based Program using JAXP or XML API in reading XML file for Students Information and Display HTML Table.	02
4.	Develop Java Based Web Service using REST and SOAP-Based web service in NetBeans for University Course List and Search Course based Course Title and Course ID.	04
5.	Create DTD file for student information and create a valid well-formed XML document to store student information against this DTD file.	02
6.	Create XMS schema file for student information and create a valid well-formed XML document to store student information against this DTD file.	04
7.	Create web calculator service in .NET Beans and create Java client to consume this web service.	02
8.	Develop same web service using JX-WS.	04
9.	Create web calculator service in .NET and Create java client to consume web service developed using Apache AXIS.	02
10.	Using WS –GEN and WS-Import develop the java web service & call it by Java Client.	04

Text Book(s):

Title	Author/s	Publication
Service Oriented Architecture: Concepts, Technology, and Design	Thomas Erl	Pearson education

Reference Book(s):

Title	Author/s	Publication
Applied SOA	Michael Rosen, Boris L, Kevin S., Marc J. B.	Wiley Publication.
SOA based Enterprise Integration	Waseem Roshen	TMH Publication

Web Material Link(s):

- https://www.service-architecture.com/articles/web-services/service-oriented
   _architecture_soa_definition.html

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 student will be able to

- understand the concepts of Service Oriented Architecture along with the evolution of SOA.
- understand primary concepts of SOA.
- know the integration of SOA technological points with Web Services.
- implementation of SOA in the development cycle of Web Services.
- integrate SOA technologies with Web Services paradigms.
- can learn the reference model of Service Oriented baseline backend design for the cloud environment.

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE3531
Course Name: Wireless Network and Mobile Computing
Prerequisite Course(s): Computer Networks (SECE3011)

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to
- explain the various terminology, principles, devices, schemes, concepts, algorithms and different methodologies used in Wireless Communication Networks.
- learn the basics of Wireless voice and data communication technologies.
- build knowledge on various Mobile Computing Algorithms.
- build skills in working with Wireless application Protocols to develop mobile content applications.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Mobile Computing Architecture** Types of Networks, Architecture for Mobile Computing, 3-tier Architecture, Design Considerations for Mobile Computing, Applications. **Wireless Transmission** Signals, Antennas Signal propagation, Multiplexing, Modulation, Cellular Systems. **Medium Access Control** Motivation for a specialized MAC, SDMA, FDMA, TDMA, CDMA.	03	05
2.	**Wireless Networks – 1** GSM and SMS, Global Systems for Mobile Communication (GSM and Short Service Messages SMS), GSM Architecture, Protocols, Call routing in GSM, Handover, Security, Introduction to SMS, SMS Architecture, SM MT, SM MO, SMS as Information bearer, applications.	04	15

3.	**Wireless Networks – 2** GPRS, GPRS and Packet Data Network, GPRS Network Architecture, GPRS Network Operations, Data Services in GPRS, Applications for GPRS, Billing and Charging in GPRS.	04	15	
4.	**Wireless Networks –3** 3G,4G, and 5G Networks, WiMAX, Third Generation Networks, Fourth Generation Networks, Vision of 5G,3G vs. 4G vs. 5G, Features and Challenges, Introduction to WiMAX.	04	15	

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Mobile network layer** Mobile IP, Dynamic Host Configuration protocol, Mobile ad-hoc networks **Mobile Transport layer** Traditional TCP, classical TCP improvements, TCP over 3G/4G wireless networks	04	10
2.	**Mobile OS and Computing Environment** Smart Client Architecture, The Client: User Interface, Data Storage, Performance, Data Synchronization, Messaging. The Server: Data Synchronization, Enterprise Data Source, Messaging. Mobile Operating Systems, The Development Process,	04	15
3.	**Building Mobile Internet Applications** Thin client: Architecture, the client, Middleware, Messaging Servers, Processing a Wireless request, Wireless Applications Protocol (WAP) Overview, Wireless Languages: Markup Languages, HDML, WML, HTML, cHTML, XHTML, VoiceXML.	04	15
4.	**The architecture of future Networks, Wireless Sensor Network, IoT**	03	10

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Setup & Configuration of Wireless Access Point (AP)	04
2.	Implementation of Wireless Network with a number of nodes and different parameters using Simulator.	04
3.	Study of WLAN: Ad Hoc & Infrastructure Mode	04
4.	GSM modem study and SMS client-server application	04
5.	Mobile Internet and WML	04
6.	Design and Program Income Tax and Loan EMI Calculator for Mobile Phones	04
7.	Implementation of Mobile Network using Network Simulator (NS2)	06

Text Book(s):

Title	Author/s	Publication
Mobile Communications	Schiller	Pearson
Wireless Communications & Networks	William Stallings	Pearson

Reference Book(s):

Title	Author/s	Publication
Principles of Mobile Computing	UIWE Hansman, Other Merk, Martin-S-Nickious, Thomas Stohe	Springer international Edition
Mobile Computing	Ashok K. Teludkar	TMH
Mobile AdHoc Networks	Chai K.Toh	Prentice Hall
Mobile Computing	Sipra DasBit,Biplab K. Sikdar	PHI,2009

Web Material Link(s):

- http://alphace.ac.in/downloads/notes/cse/10cs831.pdf

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 student will be able to
- understand the fundamentals of wireless communications.
- analyze security, energy efficiency, mobility, scalability, and their unique characteristics in wireless networks.
- demonstrate basic skills for cellular networks design.
- apply knowledge of TCP/IP extensions for mobile and wireless networking.

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE3541
Course Name: Software Testing & Quality Assurance
Prerequisite Course(s): Software Engineering (SEIT3010)

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to
- identify correctness, completeness and quality of developed Software.
- identify the importance of software testing in Software Development Life-Cycle.
- gain knowledge about various types of software testing.
- train students to create good test cases and improve the quality of software.
- study software testing process and various automated software testing tools.
- develop an application and test it using any automated testing tool.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Basic of software testing & Terminology** Software Development & Software Testing Life Cycle- role and activities, Necessity and Objectives of testing, Quality Concepts, Quality Control, McCall's factor model, Different Software Development Model, Object– oriented testing, Web testing, GUI testing, Elements of Software quality assurance, Quality Assurance Activities, Statistical Quality Assurance, Software Reliability, SQA plan, Testing Standards:-IEEE, CMM, ANSI	5	10
2.	**Levels of Testing** Verification and Validation Model, Techniques of Verification:- Peer Review, Walkthrough, Inspection, FTR, Unit testing, Integration testing, Function Testing, System testing, Installation Testing, Usability Testing, Regression testing, Performance testing:-Load Testing, Stress Testing, Security testing, Volume testing, Acceptance testing:-Alpha testing, Beta testing, Gamma testing.	6	20

3.	**Testing Methods** Black Box methods: -Equivalence partitioning, Boundary-value analysis, Error guessing, graph-based testing methods, Decision Table Testing. White Box methods: -Statement coverage, Decision coverage, Condition coverage, Path testing, Data flow testing.	4	20

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Testing Tools** Features of test tool, Guidelines for selecting a tool, Tools and skills of tester, Static testing tools, Dynamic testing tools, Advantages and disadvantages of using tools, Introduction to open source testing tool.	4	15
2.	**Test Planning & Documentation** Development plan and quality plan objectives, Testing Strategy: -type of project, type of software, Test Management, Strategic Management, Operational Test Management, Managing the Test Team, Test Plans, Test Case, Test Data, Risk Analysis.	6	15
3.	**Defect Management and Test Reporting** Defect Classification, Defect Management Process, Defect Management Tools, Defect life cycle, Defect Reporting, Test reporting, Qualitative and quantitative analysis, Fagan Inspection.	5	20

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Study of manual and automated Testing	02
2.	Introduction to open source testing tool	04
3.	Recording test in analog and context sensitive mode	02
4.	Synchronizing test	02
5.	Checking GUI Objects	02
6.	Checking Bitmap Objects	02
7.	Creating data driven test	02
8.	Maintaining test script	02
9.	Project (Creating test report in Bugzilla)	10
10.	Developing test cases for a particular task	02

Text Book(s):

Title	Author/s	Publication
Software testing principles, Techniques and Tools	M.G.Limaye	Tata McGraw Hill
Software testing	Ron Pattorn	Tech Publications
Software Engineering- a practitioner's approach	Roger Pressman	McGraw Hill

Reference Book(s):

Title	Author/s	Publication
Software testing	Rex Black,	Wrox Publications
Software testing techniques	Boris Bezier	Dreamtech Publications
Effective Methods for Software Testing	William E. Perry	Wiley Publications

Web Material Link(s):

1. https://nptel.ac.in/courses/106105150/
2. https://www.tutorialspoint.com/software_testing/software_testing_qa_qc_testing.htm
3. https://www.softwaretestinghelp.com/web-application-testing/

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 student will be able to

- to understand the importance of software testing in software development process.
- to generate test cases from software requirements.
- to identify the inputs and deliverables of the testing process.
- to understands the importance of automated software testing tools.

P P Savani University
School of Engineering

Department of Information Technology

Course Code: SEIT3531
Course Name: Image Processing
Prerequisite Course(s): Computer Graphics & Multimedia (SECE2051

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help the learners to
- understand the fundamentals of image processing.
- apply various processes on images for image understanding.
- understand the design aspects and realization of image processing applications.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction and Digital Image Fundamentals** Digital Image Fundamentals, Human visual system, Image as a 2D data, Image representation – Grayscale and Color images, image sampling and quantization.	03	15
2.	**Image enhancement in the Spatial domain** Basic gray level Transformations, Histogram Processing Techniques, Spatial Filtering, Low pass filtering, High pass filtering.	05	15
3.	**Filtering in the Frequency Domain:** Preliminary Concepts, Extension to functions of two variables, Image Smoothing, Image Sharpening, Homomorphic filtering.	03	10
4.	**Image Restoration and Reconstruction:** Noise Models, Noise Reduction, Inverse Filtering, MMSE (Wiener) Filtering.	04	10
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Color Image Processing:** Color Fundamentals, Color Models, Pseudo color image processing.	02	10

2.	**Image Compression** Fundamentals of redundancies, Basic Compression Methods: Huffman coding, Arithmetic coding, LZW coding, JPEG Compression standard.	03	10
3.	**Morphological Image Processing** Erosion, dilation, opening, closing, Basic Morphological Algorithms: hole filling, connected components, thinning, skeleton.	02	10
4.	**Image Segmentation** point, line and edge detection, Thresholding, Regions Based segmentation, Edge linking and boundary detection, Hough transform.	04	10
5.	**Object Recognition and Case studies** Object Recognition- patterns and pattern classes, recognition based on decision-theoretic methods, structural methods, case studies – image analysis, Application of Image processing in process industries.	04	10

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to Image Processing Toolbox.	04
2.	Read an 8bit image and then apply different image enhancement techniques: (a) Brightness improvement (b) Brightness reduction (c) Thresholding (d) Negative of an image (e) Log transformation (f) Power Law transformation.	02
3.	Implement different interpolation techniques using MATLAB/ Scilab.	02
4.	Read an image, plot its histogram then do histogram equalization and comment about the result.	02
5.	(a) Implement Gray level slicing (intensity level slicing) in to read cameraman image. (b) Read an 8bit image and to see the effect of each bit on the image. (c) Read an image and to extract 8 different planes i.e. 'bit plane slicing."	04
6.	Implement various Smoothing spatial filter	02
7.	Read an image and apply (1) Gaussian 3x3 mask for burring (2) High pass filter mask with different masks (3) Laplacian operator with center value positive and negative (4) High boost filtering.	02
8.	Write a program to implement various low pass filters and high pass filter in the frequency domain.	02
9.	Write a program for erosion and dilation, opening & closing using inbuilt and without inbuilt function.	02
10.	Implement and study the effect of Different Mask (Sobel, Prewitt, and Roberts)	02
11.	Implement various noise models and their Histogram	02

12.	Implement inverse filter and Wiener filter over image and comment on them	02
13.	Implement Image compression using DCT Transform	02

Text Book(s):

Title	Author/s	Publication
Digital Image Processing	Rafael C. Gonzalez, Richard E. Woods	Pearson Education
Fundamentals Digital Image Processing	Jain Anil K.	Prentice Hall India Learning

Reference Book(s):

Title	Author/s	Publication
Image Processing, Analysis and Machine Vision	Milan Sonka, Vaclav Hlavac, Roger Boyle	CL Engineering
Biomedical Image Analysis	Rangaraj M. Rangayyan	CRC Press
Digital Image Processing	William K. Pratt	John Wiley & Sons

Web Material Link(s):

- https://nptel.ac.in/courses/106105032/

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 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 student will be able to

- apply knowledge of mathematics for image understanding and analysis.
- design and analysis of techniques/processes for image understanding.
- design, realize and troubleshoot various algorithms for image processing case studies.
- select the appropriate hardware and software tools (Contemporary) for image analysis.