Syllabus Book

2nd Year B. Sc. (IT)

(Offered under School of Sciences)

P P Savani University

Host Institute: School of Engineering

Effective From: 2019-20

Authored by: P P Savani University

P P SAVANI UNIVERSITY														
SCHOOL OF ENGINEERING														
TEACHING & EXAMINATION SCHEME FOR SECOND YEAR B. Sc. (IT) PROGRAMME														
Sem	Course Code	Course Name	Teaching Scheme					Examination Scheme						
			Contact Hours				Credit	Theory		Practical		Tutorial		Total
			Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
3	SESH2060	Statistics	3	0	2	5	5	40	60	0	0	50	0	150
	SSIT2010	Computer Networks	3	2	0	5	4	40	60	20	30	0	0	150
	SSIT2020	Programming with Python	2	4	0	6	4	40	60	40	60	0	0	200
	SSIT2030	Software Lab	0	4	0	4	2	0	0	100	0	0	0	100
	SSIT2920	Minor Project-I	5			5	5	0	0	100	0	0	0	100
	SEPD2010	Critical Thinking, Creativity & Decision Making	2	0	0	2	2	40	60	0	0	0	0	100
	SSIT2910	Industrial Exposure				0	2							100
					Total	**27**	**24**							**900**
4	SSIT2040	Operating Systems	3	2	0	5	4	40	60	20	30	0	0	150
	SSIT2051	Internet of Things	2	4	0	6	4	40	60	40	60	0	0	200
	SSIT2060	Mobile Application Development	2	4	0	6	4	40	60	40	60	0	0	200
	SSIT2930	Minor Project-II	5			5	5	0	0	100	0	0	0	100
	SEPD3010	Professional Communication & Soft Skills	1	2	0	3	2	0	0	50	50	0	0	100
		Elective-I	2	2	0	4	3	40	60	20	30	0	0	150
					Total	**29**	**22**							**900**

CONTENTS

Semester 3

Semester 4

Elective-I

P P Savani University
School of Sciences

Department of Science & Humanities

Course Code: SESH2060
Course Name: Statistics
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

- demonstrate understanding of statistical methods in support of the analysis, design and application for problem solving in the field of Data Sciences.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Data & Descriptive Statistics** Elements, Variables and Observations Scale of Measurement, Cross Sectional and Time Series Data, Qualitative Data and Quantitative Data, Frequency Distribution, Relative Frequency and Percent Frequency Distributions, Bar Charts and Pie Charts, Dot Plot, Histogram, Ogive, Measure of Location: Mean, Median and Mode for Individual series, Discrete Frequency Distribution and Continuous Frequency Distribution, Percentiles & Quartiles, Measure of Variability: Range, Interquartile Range, Variance, Standard Deviation, Coefficient of Variation.	10	25
2.	**Exploratory Data Analysis** Distribution Shape, z-Scores, Chebyshev's Theorem, Empirical Rule, Outliners, Five Number Summary, Box Plot.	07	15
3.	**Correlation Analysis** Type and properties of Correlation, Karl-Pearson's coefficient.	05	10

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Probability** Experiments, Counting Rules, and Assigning Probabilities, Events and their Probabilities, Relationships of Probability, Conditional Probability, Bayes' Theorem.	06	10
2.	**Discrete and Continuous Probability Distribution** Random Variables, Discrete Probability Distributions, Expected Value and Variance, Binomial Probability Distribution, Poisson Probability Distribution, Uniform Probability Distribution, Normal Probability Distribution.	10	25
3.	**Testing of Hypothesis** Introduction, Sampling, Tests of significance for parametric test, Null Hypothesis, Type 1 and Type 2 errors, Level of significance, Chi-square test, Student's t-test, Seducer's f-test.	07	15

List of Tutorial(s):

Sr. No.	Name of Tutorial	Hours
1.	Data & Descriptive Statistics-1.	2
2.	Data & Descriptive Statistics-2.	2
3.	Data & Descriptive Statistics-3.	4
4.	Exploratory Data Analysis.	4
5.	Correlation Analysis.	4
6.	Introduction to Probability.	4
7.	Discrete and Continuous Probability Distribution-1.	2
8.	Discrete and Continuous Probability Distribution-2.	2
9.	Discrete and Continuous Probability Distribution-3.	2
10.	Testing of Hypothesis.	4

Text Book(s):

Title	Author/s	Publication
Statistics for Business and Economics	Anderson, Sweeney and Williams	Cengage Learning

Reference Book(s):

Title	Author/s	Publication
Probability and statistics for Computer Science	James L. Johnson	Wiley Publication
Quantitative Methods	Nazneen Khan Sarguroh, Dr. Abhilasha S. Magar, Prof. Rajiv S. Mishra	Himalaya publishing House

Web Material Link(s):

- https://nptel.ac.in/courses/111105041/
- https://nptel.ac.in/courses/111105090/

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.

Tutorial:

- Continuous evaluation consists of performance of tutorial which will be evaluated out of 10 marks for each tutorial and average of the same will be converted to 30 marks.
- MCQ examination/Application based small project report writing of 10 marks.
- Internal viva consists of 10 marks.

Course Outcome(s):

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

- recognize elements and variable in statistics and summarize qualitative and quantitative data.
- calculate mean, median and mode for individual series, Discrete Frequency Distribution and Continuous Frequency Distribution.
- outline properties of correlation and compute Karl-Pearson's coefficient of correlation.
- apply concept of hypothesis testing for analyzing data.

P P Savani University
School of Sciences

Department of Computer Application

Course Code: SSIT2010
Course Name: Computer Networks
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	-	04	40	60	20	30	-	-	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners 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 Communications, 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.	05	10
2.	**Physical Layer** Data and transmission techniques, Multiplexing, Transmission media, Asynchronous Communication, Wireless transmission.	06	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, LAN architectures, IEEE 802, OSI, Ethernet (CSMA/CD).	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	26
2.	**Transport Layer** Transport services, Design issues, transport layer protocols, Congestion Control, QOS and its improvement.	06	12
3.	**Application Layer** Client-Server Model, DNS, SMTP, FTP, HTTP, WWW, and recent development.	08	12

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 Communication	William Stallings	Prentice Hall

Web Material Link(s):

- http://www.tutorialspoint.com/computer_fundamentals/computer_networking.htm\
- https://nptel.ac.in/courses/106105080/
- https://www.cisco.com/c/en_in/training-events/training-certifications/certifications.html

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 per each practical. At the end of the semester, 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 during End Semester Examination.
- Viva/Oral performance consists of 15 marks during End Semester Examination.

Course Outcome(s):

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

- understand the basics of data communication.
- work with various types of computer networks.
- understand the concepts of protocols, network interfaces, and performance issues in networks.

P P Savani University
School of Sciences

Department of Computer Application

Course Code: SSIT2020
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	
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 importance of practical oriented approach.
- develop ability to implement real life programming problems.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Introduction to Python, History, Features and Applications of Python, Python Input Output, Python basic Operators.	02	06
2.	**Python Data Types** Different Data Types in Python: Numeric, String and Sequential, Variables in Python.	01	04
3.	**Python Program Flow Control** Conditional blocks using if, else and else if, Simple for loops in Python, for loop using ranges, use of while loops in Python, Loop manipulation using pass, continue, break and else.	04	12
4.	**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.	08	28
Section II			
Module No.	Content	Hours	Weightage in %
1.	**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	16

2.	**Files in Python** Introduction to file input and output, Writing Data to a File, Reading Data from a File, using loops to process files.	02	06
3.	**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.	06	22
4.	**Exception Handling in Python** Introduction to Exception and Errors, The Exception Handling mechanism in Python.	02	06

List of Practical:

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 Data types 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.	06
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.	06
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.	**Python Regular Expressions** Email, URL validation and Pattern finding using regular expression.	06
14.	Developing mini application using Python.	12

Text Book(s):

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

Reference Book(s):

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

Web Material Link(s):

- https://www.python.org/
- https://www.w3schools.com/python
- https://www.youtube.com/watch?v=rfscVS0vtbw
- 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.
- develop efficient programs with their own logic & capabilities.
- learn added features of using Python in real life applications.
- learn and develop small application.

P P Savani University
School of Sciences

Department of Computer Application

Course Code: SSIT2030
Course Name: Software Lab
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	04	00	02	00	00	100	00	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help the learners to
- learn new tools as per recent trends in the industry.
- develop small software modules.

Course Content:
Lab performances based on any one/two software development tools/programming languages from the list below:

1) Matlab
2) GNU Octave
3) Mathematica
4) SciLab
5) Weka
6) R programming language
7) UI/UX design software
8) Multi-media software tools
9) MongoDB
10) ADVANCED WEB TECHNOLOGIES - LAMP, JSP, Apache Web server

Any emerging tools/software based on industry requirement.

Course Evaluation:
Practical:
- Continuous Evaluation as per the guidelines of the course coordinator declared at the beginning of the semester which consists of 100 marks.

Course Outcome(s):
After completion of the course, the student will be able to
- apply practical knowledge for project development of a real time application.
- explore the technological advancements in the field of Information Technology.

P P Savani University
School of Sciences

Department of Computer Application

Course Code: SSIT2920
Course Name: Minor 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	
05			05	00	00	100	00	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- Identify, analyse and articulate projects with a comprehensive and systematic approach.
- develop creative thinking.
- perform in a dynamic team.

Guideline(s):

Sr. 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 proposed title, get approval from the concerned faculty.	06	10
2.	**Literature Review** Study in detail about the topic chosen.	12	10
3.	**Project Proposal** Prepare the proposal on the aspect of the selected area to work upon.	10	40
4.	**Implementation** Implementation of the 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 (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 work carried out.	20
4.	Report writing as per guidelines.	20
5.	Final Presentation & Question-Answer session.	20
	Grand 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 in real time problems.
- develop skills to work in a team in development of technical projects.

P P Savani University
School of Sciences

Centre for Skill Enhancement & Professional Development

Course Code: SEPD2010
Course Name: Critical Thinking, Creativity & Decision Making
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	00	00	02	40	60	00	00	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- develop a familiarity with the mechanics of critical thinking and logic.
- understand basic concepts of critical and creative thinking.
- explore and understand critical thinking for the purpose of creativity in the context of the professional, social and personal spectrum.
- explore an application critical thinking and creativity in personal, social, academic, global and professional life.
- understand decision making as a skill to be learned through critical thinking.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Critical Thinking** • Concept and meaning of Critical Thinking • Significance of Critical Thinking in personal, social and professional life • Thinking with arguments, evidences and language	08	25
2.	**Applied Critical Thinking** • Inductive and Deductive Thinking • Questioning for Generating Ideas • Socratic Questioning and its application	07	25
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Conceptual Thinking** • Second-order thinking • Synthesizing	03	10

2.	**Creative Thinking and Decision Making** • Problem Solving • Adapting Various Structures of Decision Making	06	20
3.	**Moral Thinking** • Generating and structuring ideas • Designing and Evaluating the solutions • Case Study	06	20

Text Book(s):

Title	Author/s	Publication
Thinking Skills for Professionals	B. Greetham, Palgrave	Macmillan, 2010

Reference Book(s):

Title	Author/s	Publication
An Introduction to Critical Thinking and Creativity: Think More, Think Better	J. Y. F. Lau	John Wiley & Sons., New Jersey
Critical Thinking: A Beginner's Guide to Critical Thinking, Better Decision Making, and Problem Solving	Jennifer Wilson	CreateSpace Independent Publishing Platform, 2017
Creativity and Critical Thinking	Steve Padget	Routledge 2013

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.

Course Outcome(s):

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

- comprehend the concept and application of critical thinking as well as its applications.
- understand the critical thinking in the context of creativity, logical arguments, moral reasoning.
- understand the application of critical thinking for social, academic, global and professional spectrum.
- correlate their thinking skills for better productivity and outcome-based tasks.
- be in a better position to apply the 360^{o}analysis of the situation for decision making.

P P Savani University
School of Engineering

Department of Computer Application

Course Code: SSIT2910
Course Name: Industrial Exposure
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

- get exposed to the industrial spectrum.
- learn the mechanisms of industry/ workplace.
- be aware about work culture and policies of industries.

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

- get acquainted with the industrial scenario.
- be aware about his future prospects in the respective field.
- gain knowledge of work culture and industrial expectations.

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 Sciences

Department of Computer Application

Course Code: SSIT2040
Course Name: Operating Systems
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

- learn the principles of operating system design.
- understand architecture of computer based operating systems and its components.
- understand various software and hardware processes and its life cycle.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Introduction to OS, History of OS, Types and functions of OS.	02	06
2.	**Processes and Threads** Process Concept, Process State, Process Control Block, Threads, Types of Threads, Multithreading.	04	08
3.	**Inter-process Communication** Race Conditions, Critical Regions, Mutual exclusion with busy waiting, Sleep and Wakeup, Semaphores, Mutexes, Monitors, Message Passing, Barriers; CPU Scheduling: CPU-I/O burst cycle, Types of schedulers, Context switch, Pre-Emptive Scheduling, Dispatcher, Scheduling criteria; Scheduling algorithms: FCFS, SJF, Priority scheduling, Round-Robin scheduling.	12	26
4.	**Deadlocks** Resources, Conditions for Deadlocks, Deadlock modelling, The ostrich algorithm, Deadlock detection and recovery, Deadlock avoidance, Deadlock prevention, Other issues: Two-phase locking, Communication deadlocks, live locks, starvation.	04	10

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Memory Management** Main memory: Background, Swapping, Contiguous memory allocation, Segmentation, Paging, Structure of page table, Virtual memory: Background, Demand paging, copy-on write, page replacement algorithms: Optimal page replacement, not recently used, FIFO, second chance page replacement, Cloak page replacement, LRU; Allocation of frames, Thrashing.	14	25
2.	**Input Output Management** Principles of I/O hardware: I/O devices, device controllers, memory mapped I/O, DMA, principles of I/O software: goals of I/O software.	06	15
3.	**File Systems** Introduction; Files: naming, structure, types, access, attributes, operations.	03	10

List of Practical:

Sr. No	Name of Practical	Hours
1.	Study of basic commands of Linux.	02
2.	Study of Advance commands and filters of Linux/UNIX.	02
3.	Write shell scripts to perform several computations like add and subtract numbers, find average, percentage. Also find factorial of a given number. Generate Fibonacci series etc.	04
4.	Simulate CPU scheduling algorithms (E.g. FCFS, SJF, Round Robin etc.).	06
5.	Simulate contiguous memory allocation techniques (E.g. Worst-fit, Best-fit, Next-fit, and First-fit).	04
6.	Simulate Banker's algorithm for deadlock avoidance.	04
7.	Simulate page replacement algorithms (E.g. FIFO, LRU, Optimal).	04
8.	Simulate disk scheduling algorithms (E.g. FCFS, SCAN, C-SCAN).	04

Text Book(s):

Title	Author/s	Publication
Operating System Concepts	Silberschatz A., Galvin P. and Gagne G	Wiley
Modern Operating Systems	Andrew S. Tanenbaum	Pearson Education

Reference Book(s):

Title	Author/s	Publication
Operating Systems: Internals and Design Principles	William Stallings	Pearson
UNIX and Shell Programming	Behrouz A. Forouzan, Richard F. Gilberg	Cengage Learning
Operating Systems	Dhamdhere D. M	Tata McGraw Hill

Web Material Link(s):

- https://nptel.ac.in/courses/106108101/
- https://nptel.ac.in/courses/106106144/
- https://computer.howstuffworks.com/operating-system.htm
- https://www.tutorialspoint.com/computer_fundamentals/computer_operating_system.htm
- https://www.geeksforgeeks.org/operating-systems-need-and-functions/

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 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 during End Semester Examination.
- Viva/Oral performance consists of 15 marks during End Semester Examination.

Course Outcome(s):

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

- learn the fundamentals of Operating System design.
- understand and differentiate various operating system architectures and its interfaces.
- perform inter-process communication.

P P Savani University
School of Sciences

Department of Computer Application

Course Code: SSIT2051
Course Name: Internet of Things
Prerequisite Course(s): Programming with Python (SSIT2020)

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 Internet of Things.
- learn how boards and sensors work.
- learn how to develop IoT applications.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to IoT** Introduction to Internet of things, Choosing right boards, selection of hardware and software.	03	06
2.	**Introduction to Arduino platform** The architecture of Arduino boards, types of boards, connections, LED patterns and C programming for Arduino.	04	20
3.	**Introduction to various Sensors** Sound sensors, DC motors, Touch, Temperature, Ultrasonic Gyroscope, Accelerometer, PIR.	04	12
4.	**Introduction to Raspberry Pi platform** Choosing a right board, IoT Device, Tools, Sensing IoT Environments.	04	12
SECTION II			
Module No.	Content	Hours	Weightage in %
1.	**IoT and iBeacons** Introduction to iBeacon, Hardware & Software, Connection to Serve, Classic distributed the problem.	03	14

2.	**IoT device connecting to the cloud** Introduction to the cloud for IoT, connecting IoT device to cloud, IOT on a global network.	04	14
3.	**RFID and MQTT** Introduction to RFID, MQTT, Hardware used for IoT RFID, Building MQTT server, Data on RFID Server.	04	14
4.	**IoT Security** IOT Security, Dangers, Assigning values to Information, Security Components, Key Management, Update Management.	04	08

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to IoT and Arduino Platform	04
	The architecture of UNO R3 Board	
	Blink LED Example	
2.	Connect multiple LED and Various Patterns in LED	04
3.	Introduction of Various sensors	06
4.	Connecting motor to Arduino board	
5.	PIR sensor example	04
6.	Accelerometer and gyroscope for Arduino	02
7.	Example of accelerometer and gyroscope	04
8.	Arduino Bluetooth &wifi connectivity	06
9.	Small Project Using Arduino board and sensors	08
10.	Introduction to Raspberry board - architecture and programming	02
11.	Installation of OS on Raspberry Pi	04
12.	Basic Python programs, access GPIO	06
13.	Small Project using Raspberry Pi and sensors.	10

Text Book(s):

Title	Author/s	Publication
Beginning Arduino (2nd Edition)	Michael McRoberts	TIA
Raspberry Pi IoT Projects	John C. Shovic	Apress

Reference Book(s):

Title	Author/s	Publication
Mastering Internet of Things: Design and create your own IoT applications using Raspberry Pi 3	Peter Waher	Packt

Web Material Link(s):

- https://www.ibm.com/blogs/internet-of-things/what-is-the-iot/
- https://www.tutorialspoint.com/internet_of_things/
- https://www.tutorialspoint.com/arduino/
- https://pythonprogramming.net/introduction-raspberry-pi-tutorials/

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 per each practical and the 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 fundamentals of the Internet of Things.
- understand IoT architecture, hardware, and software.
- develop projects of the Internet of Things.

P P Savani University
School of Sciences

Department of Computer Application

Course Code: SSIT2060
Course Name: Mobile 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	
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 the learners to

- understand life cycle of an application/activity.
- learn design of responsive mobile applications.
- develop mobile application using open source technologies.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction of Android** Android Operating System, History of Mobile Software Development, Open Handset Alliance (OHA), The Android Platform, Installation, Android SDK, Command-Line Tools and the Android Emulator, Application Context, Application Tasks.	03	05
2.	**Android Application Design and Resource** Anatomy of an Android Application, Android Manifest file, Managing Application's Identity, Enforcing Application System Requirements, Registering Activities and other Application Components, Working with Permissions.	02	05
3.	**Exploring User Interface Screen Elements** Introducing Android Views, Layouts, TextView, Buttons, Check Boxes, Radio Groups, Indicators, SeekBar, Context Menus, User Events, Styles and Themes, Dates and Times, Retrieving Data.	05	16
4.	**Designing User Interfaces with Layouts** Creating User Interfaces in Android, View versus View Group, Layout Classes such as Fame Layout, Linear Layout, Relative Layout, Table Layout, Multiple Layouts on a Screen, Data-Driven Containers, Organizing Screens with Tabs, Scrolling Support.	03	16

5.	**Drawing and Working with Animation** Working with Canvases and Paints, Working with Text, Working with Bitmaps, Working with Shapes, Working with Animation.	02	08
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Android Storage APIs** Working with Application Preferences such as Creating Private and Shared Preferences, Adding, Updating, and Deleting Preferences. Working with Files and Directories, Storing SQLite Database such as Creating an SQLite Database, Creating, Updating, and Deleting Database Records, Closing and Deleting a SQLite Database.	05	15
2.	**Content Providers** Exploring Android's Content Providers, Modifying Content Providers Data, Enhancing Applications using Content Providers, acting as a Content Provider, Working with Live Folders.	03	10
3.	**Networking, Web and Multimedia APIs** Understanding Mobile Networking Fundamentals, Accessing the Internet (HTTP), Browsing the Web with WebView, Building Web Extensions using WebKit, Working with Flash, Multimedia, Still Images, Video and Audio.	03	15
4.	**Telephony APIs** Working with Telephony Utilities, Using SMS, Making and Receiving Phone Calls, Notifying a User, Notifying with Status Bar, Vibrating the Phone, Blinking the Lights, Making Noise, Customizing the Notification, Designing Useful Notification.	04	10

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Create Hello World Application.	02
2.	Create login application having validation of Email ID and Password.	02
3.	Create an application that will display toast (Message) on specific interval of Time.	02
4.	Create an UI such that, one screen has list of all friends. On selecting of any name, next screen should show details of that friend like Name, Image, Interest, Contact details etc.	04
5.	Create an application that will change color of the screen, based on selected options from the menu.	04
6.	Create an application with UI components: ImageButton, ToggleButton, ProgressBar.	04
7.	Create an application with UI components: Spinner, DatePicker, TimePicker, SeekBar, Switch, RatingBar.	08

8.	Using content providers and permissions, read phonebook contacts using content providers and display in list.	04
9.	Create an app to send SMS and email.	04
10.	Database Connectivity.	04
11.	Create an application to perform operations on the database.	06
12.	Create an application that will play a media file from the memory card.	04
13.	Create application using Google speech API.	06
14.	Create application using Google maps API.	06

Text Book(s):

Title	Author/s	Publication
Introduction to Android Application Development	Joseph Annuzzi Jr., Lauren Darcey, Shane Conder	Pearson Education

Reference Book(s):

Title	Author/s	Publication
Android Application Development for Dummies, 3rd Edition	Donn Felker	Wiley Publication

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 per each practical and the 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 differences between Android and other mobile development environments.
- design and develop useful Android applications with compelling user interfaces by using, extending, and creating your own layouts and views and using menus, data storage and other APIs.

P P Savani University
School of Sciences

Department of Computer Application

Course Code: SSIT2930
Course Name: Minor Project-II
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	
05			05	00	00	100	00	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learner to

- Identify, analyse and articulate projects with a comprehensive and systematic approach.
- develop creative thinking.
- perform in a dynamic team.

Guideline(s):

Sr. 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 proposed title, get approval from the concerned faculty.	06	10
2.	**Literature Review** Study in detail about the topic chosen.	12	10
3.	**Project Proposal** Prepare the proposal on the aspect of the selected area to work upon.	10	40
4.	**Implementation** Implementation of the 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 (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 work carried out.	20
4.	Report writing as per guidelines.	20
5.	Final Presentation & Question-Answer session.	20
	Grand 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 in real time problems.
- develop skills to work in a team in development of technical projects.

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	
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

- 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 the performance of practical, which will be evaluated out of 10 per each practical and the average of the entire practical 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 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 Sciences

Department of Computer Application

Course Code: SSIT2520
Course Name: Design & Analysis of Algorithms
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

- understand how to calculate time complexity and space complexity of any algorithm.
- learn to optimize programmatic aspect to solve real-time problems.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Fundamental concept of Algorithm Design & Analysis** Algorithm: characteristics, specifications, Writing Pseudo-Code, 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 sequential searching algorithms and sorting methods: bubble, insertion, selection, heap sort.	06	20
2.	**Divide and Conquer Algorithmic Design Method** Divide and conquer: basic algorithm and characteristics, Binary Search: method and analysis, Matrix Multiplication.	04	15
3.	**Greedy Method** The Greedy Method: basic algorithm and characteristics, Fractional Knapsack Problem solving using greedy method.	05	15
Section II			
Module No.	Content	Hours	Weightage in %
1.	**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.	06	18

2.	**Branch and Bound technique** Branch and bound: basic algorithm and characteristics, solving 4-queens, 8-queens, n-queens using branch & bound.	06	18
3.	**Hashing** The Symbol Table Abstract Data Types, Hash Tables, Hashing Functions, Hash collision Resolution Technique, Linear Probing.	03	14

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
13.	Implementation of greedy algorithm.	04

Text Book(s):

Title	Author/s	Publication
Fundamentals of computer algorithms	Ellis Horowitz, Sarataj Sahni, S. Rajasekaran	Universities Press
Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein	PHI

Reference Book(s):

Title	Author/s	Publication
Design and Analysis of Algorithms	S. Sridhar	Oxford Higher Education
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 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 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 during End Semester Examination.
- Viva/Oral performance consists of 15 marks during End Semester Examination.

Course Outcome(s):

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

- analyze and design algorithms.
- 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 Sciences

Department of Computer Application

Course Code: SSIT2510
Course Name: Enterprise Resource Planning
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	00	01	03	40	60	00	00	50	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- understand the business process, project management life cycle and emerging trends of ERP.
- learn new tools to support ERP in an organization.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**ERP and Related Technologies:** Introduction, Related Technologies, Business Intelligence, E-Commerce and E-Business, Business Process Reengineering, Data Warehousing, Data Mining, OLAP, Product life Cycle management, Supply chain management, Customer relationship management, Management information system, Decision support system, Executive information system.	08	25
2.	**ERP Implementation:** Implementation Challenges, Strategies, Life Cycle, Pre-implementation Tasks, Requirements Definition, Methodologies, Package selection, Project Teams, Process Definitions, Vendors and Consultants, Data Migration, Project management, Post Implementation Activities.	07	25
Section II			
Module No.	Content	Hours	Weightage in %
1.	**ERP in Action and Business Modules** Operation and Maintenance, Performance, Maximizing the ERP System Business Modules: Finance, Manufacturing, Human	08	25

	Resources, Plant maintenance, Materials Management, Quality management, Marketing, Sales, Distribution and service.		
2.	**Introduction to ERP Tools:** Marketplace, Dynamics, SAP AG, Oracle, PeopleSoft, JD Edwards	07	25

List of Tutorial(s):
Tutorials consists of discussion and implementing modules of ERP based upon above syllabus and students need to work in groups and present their ideas. Based on participation and supporting points each student in a group will be evaluated.

Text Book(s):

Title	Author/s	Publication
ERP Demystified	Alexis Leon	Tata Mc Graw-Hill
Enterprise Resource Planning	Alexis Leon	Tata Mc Graw-Hill

Reference Book(s):

Title	Author/s	Publication
Guide to Planning ERP Application	Annetta Clewwto and Dane Franklin	Mc Graw Hill

Web Material Link(s):
- https://www.saponlinetutorials.com/what-is-erp-systems-enterprise-resource-planning/
- https://www.tutorialspoint.com/management_concepts/enterprise_resource_planning.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.

Tutorial:
- Continuous evaluation consists of performance of tutorial which will be evaluated out of 10 marks for each tutorial and average of the same will be converted to 30 marks.
- Internal viva consists of 20 marks.

Course Outcome(s):
After completion of the course, the student will be able to
- analyze the life cycle of ERP and its related technologies.
- Identify implementation strategy used for ERP.
- understand the basic tools of ERP.
- apply different emerging technologies to implement ERP.

P P Savani University
School of Sciences

Department of Computer Application

Course Code: SSIT2530
Course Name: Digital Marketing
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	00	01	03	40	60	00	00	50	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- understand Digital Marketing as an effective marketing mix element for marketing products and services for new enterprise and startups.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Digital Marketing** - Introduction and Strategic Setup - Digital Marketing from traditional to modern era - Opportunities and Challenges - Role of Internet and its Current trends - Implications for business & society - Emergence of digital marketing as a tool - Drivers of the new marketing environment - Digital Marketing Framework & Models	07	25
2.	**Digital Marketing Mix** - Search Engine Advertising - Pay for Search Advertisements - Ad Placement, Rank - Creating and Enhancing Ad Campaigns - Evaluating Campaigns	08	25
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Display Marketing** - Display Ads – Concepts and Types	08	25

	- Buying Models (CPC, CPM, CPL, CPA) - Targeting Display Ads - Programmable Digital Marketing - Analytical Tools - YouTube marketing		
2.	**Social media metrics** - Mobile Advertising, - Forms of Mobile Marketing & Features - Mobile Campaign Development - Mobile Advertising Analytics - Google Analytics & Google AdWords - Data collection for web analytics - Multichannel attribution - Universal analytics and Tracking	07	25

List of Tutorial(s):
Tutorials consists of discussion and preparing report on various case studies based upon above syllabus and students need to work in groups and present their ideas. Based on participation and supporting points each student in a group will be evaluated.

Text Book(s):

Title	Author/s	Publication
Digital Marketing	Seema Gupta	Mc-Graw Hill, 1st Edition – 2017
Fundamentals of Digital Marketing	Puneet Singh Bhatia	Pearson 1st Edition - 2017

Reference Book(s):

Title	Author/s	Publication
The Art of Digital Marketing	Ian Dodson	Wiley

Web Material Link(s):
- https://www.springer.com/cda/content/document/cda.../9783319282794-c2.pdf
- https://neilpatel.com/what-is-digital-marketing/

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.

Tutorial:
- Continuous evaluation consists of performance of tutorial which will be evaluated out of 10 marks for each tutorial and average of the same will be converted to 30 marks.
- Internal viva consists of 20 marks.

Course Outcome(s):

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

- analyze different methods of digital marketing.
- understand business models on which digital marketing can have impact.
- apply knowledge of social media to make successful businesses.