PPSU

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

B. TECH. (COMPUTER SCIENCE ENGINEERING – ML & AI)

SYLLABUS BOOK

AY 2021-22

INSTITUTE VISION
To emerge as an Institute of Excellence by imparting value-based education aided with Research, Innovation and Entrepreneurial skills.

INSTITUTE MISSION	
1.	To impart the holistic engineering education of highest quality & prepare socially responsible professionals with entrepreneurial skills.
2.	To prepare value-aided engineering professionals to meet up global industry requirements by imparting cutting edge professional education.
3.	To inculcate the attitude of research and innovation among the stake holders through experiential and project-based teaching-learning pedagogy.
4.	To acquire global talent pool by providing world class amenities for teaching, learning & research.

Graduates will demonstrate ability to:

PEO No	PROGRAMME EUCATIONAL OBJECTIVES
PEO 1	Solve real-world engineering problems, design and develop innovative and cost-effective solutions exhibiting engineering skills/fundamentals to cater needs of society.
PEO 2	Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting comprehensive competitiveness.
PEO 3	Exhibit professional ethics & values, effective communication, teamwork, multidisciplinary approach, and ability to relate engineering issues to broader societal framework.

PO No	PROGRAMME OUTCOMES
PO 1	Engineering knowledge: Apply knowledge of engineering fundamentals, science, mathematics & engineering specialization for the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate and analyze complex engineering problems leading to substantial conclusions using basic principles of mathematics, science and engineering.
PO 3	Design/development of solutions: Develop solutions for complex engineering problems and design system components or processes meeting specified needs having due consideration for the safety and societal & environmental considerations.
PO 4	Conduct investigations of complex problems: Use research-based knowledge & methods like design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid & viable conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools for prediction and modeling of complex engineering activities with an understanding of the limitations.
PO 6	The engineer and society: Apply cognitive learning by the contextual knowledge to assess societal, health, safety, legal and cultural issues and following responsibilities relevant to the professional engineering practice.
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge & skill needed for sustainable development.
PO 8	Values & Ethics: Apply basic moral values & ethical principles and pledge to professional ethics/norms and responsibilities of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual/as a team member or as a leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need, do necessary preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PSO No	PROGRAMME SPECIFIC OUTCOMES (PSO) COMPUTER SCIENCE ENGINEERING (ML & AI)
PSO 1	Build skills to develop software applications in specialised areas of Computer Science & Engineering such as artificial intelligence, machine learning, data science & gaming.
PSO 2	Analyse and formulate solutions to real world and socially relevant problems using Artificial Intelligence and Machine Learning concepts.
PSO 3	Prepare technically competent employee, researcher, entrepreneur, excel in competitive exams, and boost passion for the higher studies.

Credit Guidelines (General)			
Component	**Hour/Week**	**Credit**	**Total Hours/Semester**
Theory	1	1	15
Practical	2	1	30
Tutorial	1	1	15
Note: In specific cases; extra credits can be granted for specific/important subjects.			

CO-PO Mapping Guidelines		
Mapping Level	**% age Mapping**	**Indicator**
0 / -	0	No Mapping
1	0-33	Low Level (Slightly Mapped)
2	33-66	Medium Level (Moderately Mapped)
3	>66	High Level (Strongly Mapped)

Syllabus Book

B. Tech.
Computer Science Engineering
(Machine Learning & Artificial Intelligence)

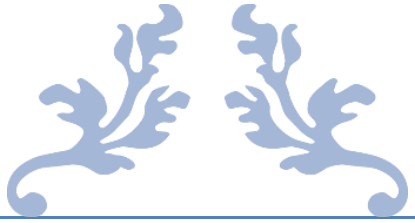
P P Savani University

School of Engineering

Effective From: 2021-22

Authored by: P P Savani University

CONTENT



FIRST YEAR B.TECH.

P P SAVANI UNIVERSITY															
SCHOOL OF ENGINEERING															
TEACHING & EXAMINATION SCHEME FOR FIRST YEAR B.TECH. COMPUTER SCIENCE ENGINEERING (MLAI) PROGRAMME AY: 2021-22															
Sem	Course Code	Course Title	Offered by	Teaching Scheme				Credit	Examination Scheme						
				Contact Hours					Theory		Practical		Tutorial		Total
				Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
1	SESH1070	Fundamentals of Mathematics	SH	2	0	2	4	4	40	60	0	0	50	0	150
	SECV1040	Basics of Civil & Mechanical Engineering	CV	4	2	0	6	5	40	60	20	30	0	0	150
	SECE1050	Programming for Problem Solving	CE	3	4	0	7	5	40	60	40	60	0	0	200
	SESH1240	Electrical & Electronics Workshop	SH	0	2	0	2	1	0	0	50	0	0	0	50
	SEHV1010	Universal Human Values-I	SH	2	0	0	2	0	100	0	0	0	0	0	100
						Total	**21**	**15**							**650**
2	SESH1080	Linear Algebra & Calculus	SH	3	0	2	5	5	40	60	0	0	50	0	150
	SEIT1030	Object Oriented Programming with Java	IT	3	4	0	7	5	40	60	40	60	0	0	200
	SEIT1010	Introduction to Web Designing	IT	0	2	0	2	1	0	0	50	0	0	0	50
	SEME1020	Engineering Workshop	ME	0	2	0	2	1	0	0	50	0	0	0	50
	SEME1040	Concepts of Engineering Drawing	ME	2	2	0	4	3	40	60	20	30	0	0	150
	SESH1210	Applied Physics	SH	3	2	0	5	4	40	60	20	30	0	0	150
	CFLS1010	Linguistic Proficiency	CFLS	2	0	0	2	2	40	60	0	0	0	0	100
						Total	**27**	**21**							**850**

P P Savani University
School of Engineering

Department of Applied Science and Humanities

Course Code: SESH1070
Course Name: Fundamentals of Mathematics
Prerequisite Course(s): Algebra, Geometry, Trigonometry &Pre-Calculus till 12th Standard level

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	04	40	60	--	--	50	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

- summarize concept of calculus to enhance ability of analysing mathematical problems.
- acquire knowledge and ability to work with differentiation and integration for
- applications of mathematical techniques in engineering.
- develop the tool of power series for learning advanced Engineering Mathematics.
- analyse and solve system of linear equations and understand characteristics of Matrices.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1	**Calculus** Limits, Continuity, Types of Discontinuity, Successive Differentiation, Rolle's Theorem, LMVT, CMVT, Maxima and Minima.	08	28
2	**Sequence and Series-I** Convergence and Divergence, Comparison Test, Integral Test, Ratio Test, Root Test, Alternating Series, Absolute and Conditional Convergence.	07	22
Section II			
Module No.	Content	Hours	Weightage in %
3	**Sequence and Series-II** Power series, Taylor and Macluarin series, Indeterminate forms and L'Hospitals Rule.	06	20
4	**Matrix Algebra** Elementary Row and Column operations, Inverse of matrix, Rank of matrix, System of Linear Equations, Characteristic Equation, Eigen values and Eigen vector, Diagonalization, Cayley Hamilton Theorem, Orthogonal Transformation	09	30

	TOTAL	30	100

List of Tutorial:

Sr. No.	Name of Tutorial	Hours
1.	Calculus-1	04
2.	Calculus-2	02
3.	Integration	04
4	Sequence and Series-1	04
5.	Sequence and Series-2	04
6.	Sequence and Series-3	02
7.	Matrix Algebra-1	04
8.	Matrix Algebra-2	02
9.	Matrix Algebra-3	02
10.	Matrix Algebra-4	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Thomas' Calculus	George B. Thomas, Maurice D. Weir & Joel Hass	Pearson
Elementary linear Algebra	Howard Anton and Chrish Rorres	Wiley

Reference Book(s):

Title	Author(s)	Publication
Advanced Engineering Mathematics	E Kreyszig	John Wiley and Sons
A textbook of Engineering Mathematics	N P Bali and Manish Goyal	Laxmi
Higher Engineering Mathematics	B S Grewal	Khanna
Engineering Mathematics for First Year	T Veerarajan	Tata Mc Graw Hill
Engineering Mathematics-1 (Calculus)	H. K. Dass and Dr. Rama Verma	S. Chand

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests, each 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 the 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 based examination consists of 10 marks.
- Internal Viva consists of 10 marks.

Course Outcome(s):

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

SESH1070	FUNDAMENTALS OF MATHEMATICS

CO 1	To recall the concepts of limit, continuity and differentiability for analysing mathematical problems.
CO 2	Explain concepts of limit, derivatives and integrals.
CO 3	Analyze the series for its convergence and divergence to slove real world problems.
CO 4	Evaluate linear system using matrices.
CO 5	Adapt the knowledge of eigenvalues and eigenvectors for matrix diagonalization

Mapping of CO with PO

SESH1070	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	1	1								1
CO 2	3	2	1									1
CO 3	3	2	1	1								
CO 4	3	2	1									1
CO 5	3	3	1		1							1

Mapping of CO with PSO

SESH1070	PSO1	PSO2	PSO3
CO 1	3		
CO 2	1	1	
CO 3	1	2	
CO 4	2	1	
CO 5	2	2	

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Calculus	1, 2, 3, 4
2	Sequence and Series-I	1, 2, 3, 4
3	Sequence and Series-II	1, 2, 3, 4
4	Matrix Algebra	1, 2, 3, 4

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV1040
Course Name: Basics of Civil & Mechanical Engineering
Prerequisite Course(s):--

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
04	02	--	05	40	60	20	30	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

- study the fundamentals of mechanical systems.
- study and appreciate significance of mechanical engineering in different fields of engineering.
- carry out simple land survey and recent trends in civil engineering.
- understand components of building, building terminology and construction materials.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Civil Engineering: An Overview** Introduction, Branches, Scope, Impact, Role of Civil Engineer, Unit of Measurement, Unit Conversion (Length, Area, Volume)	03	04
2.	**Introduction to Surveying and Levelling:** Introduction, Fundamental Principles, Classification **Linear Measurement:** Instrument Used, Chaining on Plane Ground, Offset, Ranging **Angular Measurement:** Instrument Used, Meridian, Bearing, Local Attraction **Levelling:** Instrument Used, Basic Terminologies, Types of Levelling, Method of Levelling **Modern Tools:** Introduction to Theodolite, Total Station, GPS	07	12
3.	**Building Materials and Construction:** Introduction (Types and Properties) to Construction Materials Like Stone, Bricks, Cement, Sand, Aggregates, Concrete, Steel. Classification of Buildings, Types of Loads, Acting on Buildings, Building Components and their Functions, Types of Foundation and Importance, Symbols Used in Electrical Layout, Symbols Used for Water Supply, Plumbing and Sanitation	10	14

4.	**Construction Equipment:** Types of Equipment- Functions, Uses. Hauling Equipment- Truck, Dumper, Trailer. Hoisting Equipment- Pulley, Crane, Jack, Winch, Sheave Block, Fork Truck. Pneumatic Equipment-Compressor. Conveying Equipment- Package, Screw, Flight/scrap, Bucket, Belt Conveyor. Drill, Tractor, Ripper, Rim Pull, Dredger, Drag Line, Power Shovel, JCB, HOE.	04	08
5.	**Recent Trends in Civil Engineering:** Mass Transportation, Rapid Transportation, Smart City, Sky Scarper, Dams, Rain Water Harvesting, Batch Mix Plant, Ready Mix Concrete Plant, Green Building, Earth Quake, Resisting Building, Smart Material	06	12
Section II			
Module No.	Content	Hours	Weightage in %
6.	**Basic Concepts of Thermodynamics:** Prime Movers - Meaning and Classification; the Concept of Force, Pressure, Energy, Work, Power, System, Heat, Temperature, Specific Heat Capacity, Internal Energy, Specific Volume; Thermodynamic Systems, All Laws of Thermodynamics	04	08
7.	**Fuels and Energy:** Fuels Classification: Solid, Liquid and Gaseous; their Application, Energy Classification: Conventional and Non- Conventional Energy Sources, Introduction and Applications of Energy Sources like Fossil Fuels, Solar, Wind, and Bio-Fuels, LPG, CNG, Calorific Value	04	08
8.	**Basics of I.C Engines:** Construction and Working of 2 Stroke & 4 Stroke Petrol and Diesel Engines, Difference Between 2-Stroke - 4 Stroke Engine & Petrol-Diesel Engine, Efficiency of I. C. Engines	12	18
9.	**Power Transmission Elements:** Construction and Applications of Couplings, Clutches and Brakes, Difference Between Clutch and Coupling, Types of Belt Drive and Gear Drive	10	16
	TOTAL	60	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Unit conversation Exercise and Chart preparation of building components	02
2.	Linear measurements	02
3.	Angular measurements	02
4.	Determine R. L of given point by Dumpy level. (Without Change Point)	02
5.	Determine R. L of given point by Dumpy level. (With Change Point)	02
6.	Presentation on various topics as in module about recent trends	04
7.	To understand construction and working of various types of boilers	04

8.	To understand construction and working of mountings	04
9.	To understand construction and working of accessories	04
10.	To understand construction and working 2 –stroke & 4 –stroke Petrol Engines	02
11.	To understand construction and working 2 –stroke & 4 –stroke Diesel Engines	02
	TOTAL	30

Text Book(s):

Title	Author(s)	Publication
Elements of Mechanical Engineering	S. B. Mathur, S. Domkundwar	Dhanpat Rai & Sons Publications
Elements of Mechanical Engineering	Sadhu Singh	S. Chand Publications
Elements of Civil Engineering	Anurag A. Kandya	Charotar Publication
Surveying Vol. I & II	Dr. B. C. Punamia	Laxmi Publication

Reference Book(s):

Title	Author(s)	Publication
Thermal Engineering	R. K. Rajput	Laxmi Publications
Basic Mechanical Engineering	T.S. Rajan	Wiley Eastern Ltd., 1996.
Surveying and Levelling	N. N. Basak	Tata McGraw Hill
Surveying Vol. I	S. K. Duggal	Tata McGraw Hill
Surveying and Levelling	R. Subramanian	Oxford University
Building Construction and Construction Material	G. S. Birdie and T. D. Ahuja	Dhanpat Rai Publishing
Engineering Material	S.C. Rangwala	Charotar Publication

Web Material Link(s):

- http://nptel.ac.in/course.php
- http://nptel.ac.in/courses/105107157/
- http://nptel.ac.in/courses/105101087/
- http://nptel.ac.in/courses/105107121/
- http://nptel.ac.in/courses/105104100/

Course Evaluation:

Theory:

- Continuous evaluation consists of two tests each 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 will consist 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/drawing/test of 15 marks during End Semester Exam.
- Viva/Oral performance of 15 marks during End Semester Exam.

Course Outcome(s):

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

SECV1040	BASICS OF CIVIL & MECHANICAL ENGINEERING
CO 1	Apply the principles of basic mechanical engineering.
CO 2	Comprehend the importance of mechanical engineering equipments like ic engine and power transmission elements.
CO 3	Understand different structural loads, components , materials and equipments used in the construction of a building.
CO 4	Adapt various methods of area plotting and marking before starting the construction activity.

Mapping of CO with PO

SECV1040	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	3	1	3	2	2						3
CO 2	2	3	1	3	2	2						3
CO 3	1	3	1	3	2	2						3
CO 4	1	3	1	3	2	2						3

Mapping of CO with PSO

SECV1040	PSO1	PSO2	PSO3
CO 1	2	2	2
CO 2	2	2	2
CO 3	3	2	2
CO 4	3	2	2

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1.	Civil Engineering: An Overview	1,2,3
2.	Introduction to Surveying	1,2
3.	Building Materials and Construction	1,2
4.	Construction Equipment	1,2
5.	Recent Trends in Civil Engineering:	1,2
6.	Basic Concepts of Thermodynamics	1,2,3
7.	Fuels and Energy	1,2,3
8.	Basics of I.C Engines	1,2
9.	Power Transmission Elements	1,2

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE1050
Course Name: Programming for Problem Solving
Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to
- understand the basic components of a computer system.
- identify an appropriate approach to computational problems.
- develop logic building and problem-solving skills.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Computers:** Introduction, Central Processing Unit, Main Memory Unit, Interconnection of Units, Communication between Units of a Computer System. Memory Representation and Hierarchy, Random Access Memory, Read-only Memory, Classification of Secondary Storage Devices, Types of I/O Devices. Classification of Programming Languages, Generations of Programming Languages - Machine Language, Assembly Language, High-Level Language, 4GL.	04	10
2.	**Introduction to C, Constants, Variables and Data Types:** Features of C Language, the Structure of C Program, Flow Charts and Algorithms Types of Errors, Debugging, Tracing theExecution of the Program, Watching Variables Values inMemory. Character Set, C Tokens, Keyword and Identifiers, Constants and Variables, Data Types - Declaration and Initialization, User Define Type Declarations - Typedef, Enum,Basic Input, and Output Operations, Symbolic Constants, Overflow and Underflow of Data.	06	15
3.	**Operators, Expressions, and Managing I/O Operations:**	05	10

	Introduction to Operators and its Types, Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversions in Expressions, Operator Precedence and Associatively. Introduction to Reading a Character, Writing a Character, Formatted Input and Output.		
4.	**Conditional Statements:** Decision Making & Branching: Decision Making with If and If - else Statements, Nesting of If-else Statements, The Switch and go-to statements, Ternary (?:) Operator. Looping: The while Statement, The Break Statement & The Do. While loop, The FOR loop, Jump within loops - Programs.	07	15
Section II			
Module No.	Content	Hours	Weightage in %
5.	**Arrays:** Introduction, One-dimensional Arrays, Two-dimensional Arrays, Concept of Multidimensional Arrays.	05	12
6.	**Strings:** Declaring and Initializing String Variables, Arithmetic Operations on Characters, Putting Strings Together, Comparison of Two Strings, String Handling Functions.	04	10
7.	**User-Defined Functions:** Concepts of User-defined Functions, Prototypes, function Definition, Parameters, Parameter Passing, Calling a Function, Recursive Function, Macros and Macro Substitution	04	10
8.	**Structure and Unions:** Introduction, Structure Definition, Declaring and Initializing Structure Variables, Accessing Structure Members, Copying & Comparison of Structures, Arrays of Structures, Arrays within Structures, Structures within Structures, Structures and Functions, Unions.	04	08
9.	**Pointers and File Management:** Basics of Pointers, a Chain of Pointers, Pointer and Array, Pointer to an Array, an Array of Pointers, Pointers and Functions, Dynamic Memory Allocation. Introduction to file Management and its Functions.	06	10
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to Unix Commands (creating a folder, creating a file, deleting a file, renaming files, copy a file from one location to another, listing entire directories and files, list directories, listing files, moving files from one location to another)	02
2.	Introduction to C programming environment, compiler, Linker, loader, and editor.	02

3.	Working with basic elements of C languages (different input functions, different output functions, different data types, and different operators)	06
4.	Working with C control structures (if statement, if-else statement, nested if-else statement, switch statement, break statement, goto statement)	06
5.	Working with C looping constructs (for loop, while loop, do-while and nested for loop)	10
6.	Working with the array in C (1-D array, and 2-D array)	04
7.	Working with strings in C (input, output, different string inbuilt functions)	04
8.	Working with user-defined functions in C (function with/without return type, function with/without argument, function and array)	06
9.	Working with recursive function in C	02
10.	Working with structure and union in C (structure declaration, initialization, an array of structures, structure within structure, structure and functions, an array within structure and union)	08
11.	Working with pointer in C (initialization, pointer to pointer, pointer and array, an array of pointer, pointer and function)	06
12.	Working with files in C (opening a file, data insertion, and extraction from file, file management functions)	04
	TOTAL	60

Text Book(s):

Title	Author/s	Publication
Programming in ANSI C	E. Balagurusamy	Tata McGraw Hill
Introduction to Computer Science	ITL Education Solutions Limited	Pearson Education

Reference Book(s):

Title	Author(s)	Publication
Programming in C	Ashok Kamthane	Pearson
Let Us C	Yashavant P. Kanetkar	Tata McGraw Hill
Introduction to C Programming	ReemaThareja	Oxford Higher Education
Programming with C	Byron Gottfried	Tata McGraw Hill

Web Material Link(s):

- http://www.digimat.in/nptel/courses/video/106104128/L01.html
- https://www.youtube.com/watch?v=3QiItmIWmOM

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests, each 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 the Course Coordinator.
- End Semester Examination consists of 60 marks.

Practical:

- Continuous Evaluation consists of practical performance which should be evaluated out of 10 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-voce consists of 30 marks during End Semester Exam.

Course Outcome(s):

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

SECE1050	PROGRAMMING FOR PROBLEM SOLVING
CO 1	Observe and interprete the concepts for data representation, algorithms and coding methods in computer system.
CO 2	Immediately analyze the syntax and semantics of the "c" language and apply in program.
CO 3	Manage the less memory usage while developing the program.
CO 4	Classify the types of errors occur while running the program.

Mapping of CO with PO

SECE1050	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1										
CO 2	2	1		1								
CO 3	2	1										
CO 4	2	1		1								

Mapping of CO with PSO

SECE1050	PSO1	PSO2	PSO3
CO 1	2	2	
CO 2	3	2	
CO 3	3	2	
CO 4	3	2	

Level of Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction to Computers	1,2
2	Introduction to C, Constants, Variables and Data Types	1,2,3
3	Operators, Expressions, and Managing I/O Operations	3,4
4	Conditional Statements	2,3,4
5	Arrays	2,3
6	Strings	2,3
7	User-Defined Functions	2,3,4
8	Structure and Unions	1,2,3
9	Pointers and File Management	2,3

P P Savani University
School of Engineering

Department of Applied Sciences & Humanities

Course Code: SESH1240
Course Name: Electrical & Electronics Workshop
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	--	01	--	--	50	--	--	--	50

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to
- identify basic fundamental electronic components in circuits.
- learn to use common electronic component on breadboard.
- understand components of instruments, terminology and applications.

List of Practical:

Sr No	Name of Practical	Hours
1	Understanding of electronic component with specification.	02
2	Understanding of Galvanometer, Voltmeter, Ammeter, Wattmeter and Multimeter	02
3	Understanding of breadboard connections	02
4	Drawing and wiring of basic circuits on breadboard	02
5	Verification of Ohm's law	02
6	Half wave, full wave using centre tap transformer and full wave bridge Rectifier	03
7	Kirchhoff's laws (KVL,KCL).	03
8	Faraday's laws of Electromagnetic Induction and Electricity Lab	04
9	LDR characteristics	02
10	Study of CRO, measurement of amplitude (voltage) & time period (frequency)	04
11	PCB designing	04
	TOTAL	30

Text Book:

Title	Author/s	Publication
Electronic Principles	Albert Malvino and David J Bates	Mc Graw Hill(7th Edition)

Reference Book:

Title	Author/s	Publication
Electronic Devices	Thomas L. Floyd	Pearson (7th Edition)
Electronic Devices and Circuits	David A. Bell	Oxford Press (5th Edition)
Integrated Electronics	Jacob Millman, Christos	Tata McGraw Hill (2nd Edition)

Course Evaluation:

Practical:

- Continuous Evaluation Consist of Performance of Practical which should be evaluated out of 10 for each practical in the next turn and average of the same will be converted to 20 Marks.
- Internal viva consists of 30 marks.

Course Outcome(s):

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

SESH1240	**ELECTRICAL & ELECTRONICS WORKSHOP**
CO 1	Identify the ability to design various electronic circuit on a bread board.
CO 2	Recognize the basic electronic devices and components in a circuit connection.
CO 3	Identify the ability to design a pcb.
CO 4	Define the practical side of basic physics laws.

Mapping of CO with PO

SESH1240	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	3	2	3	3	2	2		3			3
CO 2	2	3	2	3	3	2	2		3			3
CO 3	2	3	3	3	3	2	2		3			3
CO 4	2	3	2	3	3	2	2		3			3

Mapping of CO with PSO

SESH1240	PSO1	PSO2	PSO3
CO 1	3	2	
CO 2	3	2	
CO 3	3	2	
CO 4	3	2	

Level of Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Practical No	**Content**	**RBT Level**
1	Electronic Components	1,2,3,4
2	Electronic Devices	1,2,3,4
3	Understanding of Breadboard	1,2,4,5,6
4	Wiring of Breadboard	1,2,4,5,6
5	Ohm's Law	1,2,3,4
6	Rectifiers	1,2,3,5,6
7	KCL & KVL	1,2,3,4,6
8	LDR	1,2,3,6
9	Electricity Lab	1,2,3,4
10	CRO	1,2,4,5
11	PCB	1,2,6

P P Savani University
School of Engineering

Department of Applied Science and Humanities

Course Code: SESH1080
Course Name : Linear Algebra & Calculus
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	05	40	60	--	--	50	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- learn about and work with vector space, linear transformation and inner product space.
- apply concepts of linear algebra for solving science and engineering problems.
- introduce the concept of improper integral and Beta-Gamma Function.
- develop the tool of Fourier series for learning advanced Engineering Mathematics.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Vector Space** Concept of vector space, Subspace, Linear Combination, Linear Dependence and Independence, Span, Basis and Dimension, Row Space, Column Space and Null Space, Rank and Nullity.	09	20
2.	**Linear Transformation** Introduction of Linear Transformation, Kernal and Range, Rank and Nullity, Inverse of Linear Transformation, Rank Nullity Theorem,Composition of Linear Maps, Matrix associated with linear map.	07	15
3.	**Inner Product Space** Inner Product, Angle and Orthogonality, Orthogonal projection, Gram-Schmidt process and QR Decomposition, Least square decomposition, Change of basis.	07	15
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Beta and Gamma function** Improper Integrals, Convergence, Properties of Beta and Gamma Function, Duplication Formula (without proof)	06	14

5.	**Fourier Series** Periodic Function, Euler Formula, Arbitrary Period, Even and Odd function, Half Range Expansion, Parseval's Theorem	08	18
6.	**Curve tracing** Tracing of Cartesian Curves, Polar Coordinates, Polar and Parametric Form of Standard Curves, Areas and Length in Polar co-ordinates	08	18
	TOTAL	45	100

List of Tutorial:

Sr. No.	Name of Tutorial	Hours
1.	Vector Space-1	04
2.	Vector Space-2	02
3.	Linear Transformation-1	04
4	Linear Transformation-2	02
5.	Inner Product-1	04
6.	Inner Product-2	02
7.	Beta and Gamma Function-1	04
8.	Beta and Gamma Function-2	02
9.	Curve tracing-1	04
10.	Curve tracing-2	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Thomas' Calculus	George B. Thomas, Maurice D. Weir and Joel Hass	Pearson
Elementary Linear Algebra	Howard Anton and Chrish Rorres	Wiley

Reference Book(s):

Title	Author(s)	Publication
Advanced Engineering Mathematics	E Kreyszig	John Wiley &Sons
A textbook of Engineering Mathematics	N P Bali and Manish Goyal	Laxmi
Higher Engineering Mathematics	B S Grewal	Khanna
Engineering Mathematics for First Year	T Veerarajan	Tata Mc Graw Hill
Engineering Mathematics-1 (Calculus)	H. K. Dass and Dr. Rama Verma	S. Chand

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests, each 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 the 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 based examination consists of 10 marks.
- Internal Viva consists of 10 marks.

Course Outcome(s):

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

SESH1080	**LINEAR ALGEBRA & CALCULUS**
CO 1	Determine the basis and dimension of vector spaces and subspaces.
CO 2	Discuss the matrix reparentation of a linear transformation given bases of the relevant vector space.
CO 3	Identify the ordinary differentials and partial differentials and solve the maximum and minimum value of function.
CO 4	Classify gamma, beta functions & their relation which is helpful to evaluate some definite integral arising in various branch of engineering.
CO 5	Construct the graphs for function with intervals and identify more application for function.

Mapping of CO with PO

SESH1080	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1										
CO 2	1											
CO 3	2	1										
CO 4	1	1										
CO 5	1											

Mapping of CO with PSO

SESH1080	PSO1	PSO2	PSO3
CO 1			
CO 2			
CO 3	1		
CO 4			
CO 5			

Level of Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Vector Space	1, 2, 3, 4
2	Linear Transformation	1, 2, 3, 4
3	Inner product space	1, 2, 3, 4
4	Partial Derivatives	1, 2, 4, 5
5	Beta and Gamma Function	1, 2, 4, 5
6	Curve Tracing	1, 2, 4, 5, 6

P P Savani University
School of Engineering

Department of Information Technology

Course Code: SEIT1030
Course Name : Object oriented Programming with Java
Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand basics of object-oriented programming.
- identify appropriate approach to computational problems.
- develop logic building and problem-solving skills.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Programming language Types and Paradigms, Flavors of Java, JavaDesigning Goal, Features of Java Language, JVM –The heart of Java, Java's Magic Bytecode.	03	05
2.	**Object-Oriented Programming Fundamentals** Class Fundamentals, Object and Object reference, Object Lifetime and Garbage Collection, Creating and Operating Objects, Constructor and initialization code block, Access Control, Modifiers, Nested class, InnerClass, Anonymous Classes, Abstract Class and Interfaces, Defining Methods, Method Overloading, Dealing with Static Members, Use of "this" reference, Use of Modifiers with Classes & Methods, Generic Class Types.	06	15
3.	**Java Environment and Data types** The Java Environment: Java Program Development, Java Source File Structure, Compilation Executions; Basic Language Elements: Lexical Tokens, Identifiers, Keywords, Literals, Comments, Primitive Data- types, and Operators.	05	10

4.	**Class and Inheritance** Use and Benefits of Inheritance in OOP, Types of Inheritance in Java, Inheriting Data Members and Methods, Role of Constructors in inheritance, Overriding Super Class Methods, Use of "super", Polymorphism in inheritance, Type Compatibility and Conversion, Implementing interfaces.	07	15
5.	**Java Packages** Organizing Classes and Interfaces in Packages, Package as Access Protection, Defining Package, CLASSPATH Setting for Packages, Making JAR Files for Library Packages, Import and Static Import, Naming Convention for Packages.	02	05
	Section II		
Module No.	Content	Hours	Weightage in %
6.	**Array and String Concepts** Defining an Array, Initializing & Accessing Array, Multi-Dimensional Array, Operation on String, Using Collection Bases Loop for String, tokenizing a String, Creating Strings using String Buffer.	04	10
7.	**Exception Handling** The Idea behind Exception, Exceptions & Errors, Types of Exception, Control Flow In Exceptions, JVM reaction to Exceptions, Use of try, catch, finally, throw, throw in Exception Handling, In-built and User Defined Exceptions, Checked and Un-Checked Exceptions.	05	10
8.	**Thread** Understanding Threads, Needs of Multi-Threaded Programming, Thread Life-Cycle, Thread Priorities, Synchronizing, Threads, InterCommunication of Threads.	06	15
9.	**Applet** Applet & Application, Applet Architecture, Parameters to Applet.	03	05
10.	**Input-Output Operations in Java** Streams and the new I/O Capabilities, Understanding Streams, The Classes for Input and Output, The Standard Streams, Working with File Object, File I/O Basics, Reading and Writing to Files, Buffer and Buffer Management, Read/Write Operations with File, Channel, Serializing Objects.	04	10
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Introduction to Java Environment and Netbeans.	02
2.	Implementation of Java programs with classes and objects.	04
3.	Implementation of Java programs to create functions, constructors with overloading and overriding.	04

4.	Implementation of Java programs to demonstrate different access specifiers.	04
5.	Implementation of Java programs using the concept of inner classes.	02
6.	Implementation of Java programs for variables, data types, operators.	04
7.	Implementation of Java programs for inheritance (single, multilevel, hierarchical).	04
8.	Implementation of Java programs to demonstrate the use of super keyword.	02
9.	Implementation of Java programs for anonymous and abstract classes.	02
10.	Implementation of Java programs for Interface.	02
11.	Implementation of Java programs to demonstrate Java packages.	02
12.	Implementation of Java programs to use arrays and string.	06
13.	Implementation of Java programs for exception handling using all keywords (try, catch, throw, throws and finally).	04
14.	Implementation of Java programs to demonstrate the life cycle of thread.	02
15.	Implementation of Java programs for the concepts of thread priority, synchronization, inter-thread communication.	06
16.	Implementation of Applets, AWT and Web Servers.	06
17.	Implementation of file handling operations.	04
	TOTAL	60

Text Book(s):

Title	Author/s	Publication
Core Java Volume I – Fundamentals	Cay Horstmann and Gray Cornell	Pearson

Reference Book(s):

Title	Author/s	Publication
Java the complete reference	Herbert Schildt	McGraw Hill
Thinking in Java	Bruce Eckel	Pearson
Learning Java	Patrick Niemeyer & Jonathan Knudsen	O'Reilly Media

Web Material Link(s):

- https://www.coursera.org/learn/object-oriented-java
- https://www.javatpoint.com/java-tutorial
- https://www.tutorialspoint.com/java/index.htm

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted out of 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 per 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.
- External viva consists of 30 marks.

Course Outcome(s):

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

SEIT1030	OBJECT ORIENTED PROGRAMMING WITH JAVA
CO 1	Learn and acquire principles of object oriented programming concepts and its application using java programming.
CO 2	Identify syntax, semantics, data types, conditional statements, control structures, and arrays and strings in java programming language.
CO 3	Explain building blocks of java classes, objects, constructors and methods in console based java application.
CO 4	Identify the concept of polymorphism, inheritance, abstraction and interfaces and construct programs in java.
CO 5	Classify the role of packages and exception handling for access protection, name space management and reliability of code.

Mapping of CO with PO

SEIT1030	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2							1				1
CO 2	2							1				1
CO 3	2							1				1
CO 4	2	1						1				1
CO 5	2							1				1

Mapping of CO with PSO

SEIT1030	PSO1	PSO2	PSO3
CO 1		1	2
CO 2		1	2
CO 3		1	2
CO 4		1	2
CO 5		1	2

Level of Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction	1, 2
2	Object Oriented Programming Fundamentals	1, 2, 3
3	Java Environments and Data Types	2, 3,4
4	Class and Inheritance	2, 5,6
5	Java Packages	2,4,5,
6	Array and String Concept	2,3,6
7	Exception Handling	2,3,4
8	Thread	3,5,6
9	Applet	3,6
10	Input-Output Operation in Java	4,5,6

P P Savani University
School of Engineering

Department of Information Technology

Course Code: SEIT1010
Course Name : Introduction to Web Designing
Course Prerequisite(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	--	01	--	--	50	--	--	--	50

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand basic components of internet.
- learn basic web technologies such as HTML, JavaScript and CSS.
- develop basic knowledge of website designing.

List of Practical:

Sr. No	Name of Practical	Hours
1.	Implementation of HTML tags	12
2.	Designing Websites with basic CSS	04
3.	Designing of Responsive Website Designs using Java Script	04
4.	Development of mini project based on HTML, CSS and Java Script	10
	TOTAL	30

Reference Book:

Title	Author/s	Publication
HTML Black Book	Steven Holzner	Dreamtech press

Web Material Link(s):

- https://www.w3schools.com/

Course Evaluation:

Practical:

- Continuous Evaluation consist of performance of practical which will be evaluated out of 10 for each practical and average of the same will be converted to 20 marks.
- Prepared project during practical hours will be evaluated as a part of final submission which carries 30 marks.

Course Outcome(s):
After the completion of the course, the student will be able to,

SEIT1010	INTRODUCTION TO WEB DESIGNING
CO 1	Discover the fundamentals of website designing and webpage designing.
CO 2	Create a webpage with different look and structure.

CO 3	Manipulate the data as per the user reqirement.
CO 4	Write a code for generating a small website.

Mapping of CO with PO

SEIT1010	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2		3		3							
CO 2	2		3		3							
CO 3	2				3							
CO 4	2	2	3	3	3	3	3	3	3	3	3	3

Mapping of CO with PSO

SEIT1010	PSO1	PSO2	PSO3
CO 1	3	3	2
CO 2	3		2
CO 3			3
CO 4	3	3	3

Level of Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1.	Implementation of HTML tags	1, 2
2.	Designing Websites with basic CSS	1, 2
3.	Designing of Responsive Website Designs using Java Script	2, 3, 6
4.	Development of mini project based on HTML, CSS and Java Script	2, 3, 6

P P Savani University
School of Engineering

Department of Mechanical Engineering

Course Code: SEME1020
Course Name : Engineering Workshop
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	--	01	--	--	50	--	--	--	50

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- learn about the safety measures required to be taken while using working in workshop.
- learn about how to select the appropriate tools required for specific operation.
- learn about different manufacturing technique for production out of the given raw material.
- understand applications of machine tools, hand tools, power tools and welding process.

List of Practical:

Sr. No	Name of Practical	Hours
1.	Introduction and Demonstration of Safety Norms. Different Measuring Instruments.	02
2.	To Perform a Job of Fitting Shop.	06
3.	To Perform a Job of Carpentry Shop.	06
4.	To Perform a Job of Sheet Metal Shop.	06
5.	To Perform a Job of Black Smithy Shop.	04
6.	Introduction and Demonstration of Grinding & Hacksaw Cutting Machine.	02
7.	Introduction and Demonstration of Plumbing Shop & Welding Process.	04
	TOTAL	30

Text Book(s):

Title	Author(s)	Publication
Elements of Workshop Technology Vol. I	Hajra Chaudhary S.K.	Media promoters & Publishers
Workshop Technology Vol. I and II	Raghuvanshi B.S.	Dhanpat Rai & Sons

Reference Book(s):

Title	Author(s)	Publication
Workshop Technology Vol. I	W.A.J. Chapman	Edward Donald Publication
Workshop Practices	H S Bawa	Tata McGraw-Hill
Basic Machine Shop Practice Vol. I, II	Tejwani V.K.	Tata McGraw-Hill

Web Material Link(s):

- http://nptel.ac.in/course.php

Course Evaluation:

Practical:

- Continuous Evaluation Consist of Performance of Practical which will be evaluated out of 10 for each practical/Tutorial and average of the same will be converted to 30 Marks.
- Internal Viva consists of 20 Marks.

Course Outcome(s):

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

SEME1020	ENGINEERING WORKSHOP
CO 1	Understand the various measuring instruments.
CO 2	Understand the safety norms required in the workshop.
CO 3	Understand the application of various tools required for different operations.
CO 4	Remember the process of manufacture from a given raw material.
CO 5	Explain various manufacturing processes in machine shop.

Mapping of CO with PO

SEME1020	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2					2			2		1	2
CO 2						3		3	3		1	3
CO 3	2					2			1		1	3
CO 4	2								3		2	3
CO 5	2								3		2	3

Mapping of CO with PSO

SEME1020	PSO1	PSO2	PSO3
CO 1	2	3	2
CO 2			
CO 3	2	3	2
CO 4	3	3	3
CO 5	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Practical No	Content	RBT Level
1	Introduction	1, 2, 4
2	Fitting shop:	1, 2, 3
3	Carpentry and Drilling Shop:	1, 2, 3
4	Sheet Metal Shop:	2, 3, 4
5	Smithy Shop:	2, 3, 4
6	Introduction to Machine Tools:	2, 3, 4
7	Introduction to Welding & Plumbing:	2, 3, 4

P P Savani University
School of Engineering

Department of Mechanical Engineering

Course Code: SEME1040
Course Name : Concepts of Engineering Drawing
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	--	03	40	60	20	30	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners

- to know conventions and the methods of engineering drawing.
- how to interpret engineering drawings using fundamental technical mathematics?
- how to construct basic and intermediate geometry?
- to improve their visualization skills so that they can apply these skills in developing new products.
- to improve their technical communication skill in the form of communicative drawings.
- to comprehend the theory of projection.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction:** Importance of the course; Use of Drawing Instruments and Accessories; BIS – SP – 46; Lettering, Dimensioning and Lines; Representative Fraction; Types of Scales (Plain and Diagonal Scales), Construction of Polygons	07	25
2.	**Engineering Curves:** Classification and Application of Engineering Curves; Constructionof Conics, Cycloidal Curves, Involutes and Spiral along with Normal and Tangent to each.	08	25
Section II			
Module No.	Content	Hours	Weightage in %
3.	**Orthographic Projection:** Types of Projections: Principle of First and Third Angle Projection - Applications & Difference; Projection from Pictorial View of Object, View from Front, Top and Sides.	08	25

4.	**Isometric Projections and Isometric Drawing:** Isometric Scale, Conversion of Orthographic Views into IsometricProjection, Isometric View or Drawing.	07	25
	TOTAL	30	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Introduction sheet (dimensioning methods, different types of line, construction of different polygon, divide the line and angle in parts, use of stencil, lettering, Plane scale and diagonal scale)	10
2.	Engineering curves	07
3.	Orthographic projection	07
4.	Isometric projection	06
	TOTAL	30

Text Book(s):

Title	Author(s)	Publication
A Text Book of Engineering Graphics	P J Shah	S. Chand & Company Ltd., New Delhi
Engineering Drawing	N D Bhatt	Charotar Publishing House, Anand

Reference Book(s):

Title	Author(s)	Publication
Engineering Drawing	P.S.Gill	S. K. Kataria & sons, Delhi
Engineering Drawing	B. Agrawal & C M Agrawal	Tata McGraw Hill, New Delhi
Engineering Drawing made Easy	K. Venugopal	Wiley Eastern Ltd

Web Material Link(s):

- http://nptel.ac.in/courses/105104148/

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each 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 will consist of 60 marks.

Practical/Tutorial:

- Continuous Evaluation Consist of Performance of Practical which should be evaluated out of 10 for each practical Tutorial and average of the same will be converted to 10 Marks.
- Internal Viva consists of 10 Marks.
- Practical performance/quiz/drawing/test of 15 Marks during End Semester Exam.
- Viva/Oral performance of 15 Marks during End Semester Exam.

Course Outcome(s):

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

SEME1040	CONCEPTS OF ENGINEERING DRAWING

CO 1	Remember bis standards while drawing lines and representing letters & dimensions.
CO 2	Understand different types of scaling and, construction of geometrical shapes using engineering tools.
CO 3	Classify the projection angles concerning the observer, object, and reference planes.
CO 4	Construct orthographic views of an object when its position with respect to the reference planes is defined.
CO 5	Develop 3d isometric views concerning 2d orthographic views and vice versa.

Mapping of CO with PO

SEME1040	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1		1									
CO 2	2	1	1	1	1							1
CO 3	2	1										
CO 4	2		1	1	1							
CO 5	2		1									

Mapping of CO with PSO

SEME1040	PSO1	PSO2	PSO3
CO 1			
CO 2		1	1
CO 3	2		1
CO 4	3	2	1
CO 5	3	2	1

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	1,2
2	Engineering Curves:	2,3,6
3	Principles of Projections	2,3,4
4	Projection of Plane	2,4,6
5	Orthographic Projection	4, 5, 6
6	Isometric Projections and Isometric Drawing	4,6

P P Savani University
School of Engineering

Department of Applied Science & Humanities

Course Code : SESH1210
Course Name: Applied Physics
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

- prepare students for career in engineering where physics principles can be applied for the advancement of technology.
- think in core concept of engineering application by studying various topics involved in branch specific application.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Quantum Mechanics:** Wave-Particle Duality, De-Broglie Matter Wave, Phase and Group Velocity, Heisenberg Uncertainty Principle and its Applications, Wave Function and its Significance, Schrodinger's Wave Equation, Particle in One Dimensional Box	06	15
2.	**Acousic and Ultrasonic:** Introduction, Classification and Characterization of Sound, Absorption Coefficients, Sound Absorbing Materials, Sound Insulation, Ultrasonic, Properties of Ultrasonic, Generation of Ultrasonic Applications of Ultrasonic.	05	10
3.	**Solid State Physics** Introduction, Lattice Points and Space Lattice, Unit Cells and Lattice Parameters, Primitive Cell, Crystal Systems. The Bravais Space Lattices. Miller Indices, X-Ray Properties, Diffraction and Bragg's Law, Bragg's, X-Ray Spectrum	06	10
4.	**Nanophysics** Nanoscale, Surface to Volume Ratio, Surface Effects on Nanomaterials, Quantum Size Effects, Nanomaterials and Nanotechnology, Unusual Properties of Nanomaterials, Synthesis of Nanomaterials, Applications of Nanomaterials	06	15

Section II

Module No.	Content	Hours	Weightage in %
5.	**Non Linear Optics:** Laser, Spontaneous and Stimulated Emission of Light, Applications of Laser, Fundamental Ideas about Optical Fibre, Advantages of Optical Fibre of Optical Fibre, Applications of Optical Fibre.	07	12
6.	**DC and AC Circuits Fundamentals** Introduction of Electrical Current, Voltage, Power and Energy; Sourcesof Electrical Energy Inductor and Capacitor, Fundamental Laws of Electric Circuits – Ohm's Law and Kirchhoff's Laws; Analysis of Series, Parallel and Series-Parallel Circuits. Alternating Voltages and Currents and their Vector and Time Domain Representations, Average and Rms Values, From Factor, Phase Difference, Power and Power Factor, Purely Resistive Inductive and Capacitive Circuits, R-L, R-C, R-L-C Series Circuits, Impedance and Admittance, Circuits in Parallel, Series and Parallel Resonance.	08	25
7.	**Electronics:** Semiconductors, Intrinsic and Extrinsic Semiconductor Advantages of Semiconductor Devices, Diodes, Transistors, Types of Bipolar Junction Transistor, Unijunction Junction Transistor, FET and MOSFETS.	07	13
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Volt-Ampere Characteristics of Light Emitting Diode	02
2.	Volt-Ampere Characteristics of Zener Diode	02
3.	To determine value of Planck's constant (h) using a photovoltaic cell	02
4.	To determine the Hall coefficient (R) and carrier concentration of a given material (Ge) using Hall effect.	04
5.	To study the Capacitors in series and parallel DC circuit.	04
6.	To determine velocity of sound in liquid using Ultrasonic Interferometer	04
7.	To study RLC Series circuit.	02
8.	To determine numerical aperture of an optical fiber.	04
9.	Determination of Young's Modulus of given material.	04
10.	Analysis of errors.	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Concept of the Modern Physics	A. Beiser	Tata McGraw-Hill Education
Basic electrical engineering	Kothari and Nagrath	Tata McGraw-Hill Education
Quantum Mechanics	P.M. Mathew, K. Venkatesan	Tata McGraw-Hill Education
Waves and Acoustics	Pradipkumar Chakrabarti Satyabrata Chawdhary	New Central Book Agency
Lasers and Nonlinear Optics	G.D. Baruah	Pragati Prakashan

Solid State Physics: Basic Electronics:	S.O. Pillai	New Age Internation Publishers
Basic Electronics for Scientists and Engineers	Dennis L. Eggleston	Cambridge University Press

Web Material Link(s):

- http:/nptel.ac.in/course.php

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests, each 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 the Course Coordinator.
- End Semester Examination consists of 60 marks.

Practical:

- Continuous Evaluation Consist 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/drawing/test of 20 marks during End Semester Exam.
- Viva/Oral performance of 10 marks during End Semester Exam.

Course Outcome(s):

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

SESH1210	**APPLIED PHYSICS**
CO 1	Understand the framework of quantum mechanics and apply the knowledge of basic quantum mechanics to construct one dimensional schrodinger's wave equation.
CO 2	Classify the phenomenon of acoustics and ultrasonic in various engineering field and apply it for various engineering and medical fields. interpret the concept of nanotechnology and understand the synthesis and applications of nanomaterials from technological prospect.
CO 3	Discover the types and properties of superconductors. relate the behaviour of superconductors at high temperatures.
CO 4	Describe the laser and articulate the idea of optical fiber communications and apply the concepts of lasers and optical fiber communications in every possible sector.
CO 5	Distinguish pure, impure semiconductors and characteristics of semiconductor devices. thus will be able to use basic concepts to analyze and design a wide range of semiconductor devices.

Mapping of CO with PO

SESH1210	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	2	1			2						1
CO 2	2	3	2			2	3					3
CO 3	2	2	2			2	3					3
CO 4	2	3	2			2	3					3
CO 5	2	3	2			2	3					3

Mapping of CO with PSO

SESH1210	PSO1	PSO2	PSO3
CO 1	3		
CO 2	3		
CO 3	3		
CO 4	2		
CO 5	3		

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Quantum Mechanics	2,3
2	Acoustic and Ultrasonic	1,3
3	Nanophysics	2,4
4	Superconductivity	2,6
5	Non linear Optics – 1	1,2
6	Non linear Optics – 2	2,3
7	Electronics	3,6

SECOND YEAR B. TECH.

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

TEACHING & EXAMINATION SCHEME FOR SECOND YEAR B.TECH. COMPUTER SCIENCE ENGINEERING (MLAI) PROGRAMME AY: 2021-22

Sem	Course Code	Course Title	Offered By	Teaching Scheme					Examination Scheme						
				Contact Hours				Credit	Theory		Practical		Tutorial		Total
				Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
3	SESH2070	Mathematical Methods for MachineLearning	SH	3	0	2	5	5	40	60	0	0	50	0	150
	SECE2071	Data Structures & Algorithm	CE	3	2	0	5	4	40	60	20	30	0	0	150
	SECE2080	Application Based Programming inPython	CE	3	4	0	7	5	40	60	40	60	0	0	200
	SECE2111	Database Management System	CE	3	2	0	5	4	40	60	20	30	0	0	150
	SEIT2031	Operating System	IT	3	2	0	5	4	40	60	20	30	0	0	150
	CFLS1020	Global Communication Skills	CFLS	2	0	0	2	2	40	60	0	0	0	0	100
	SEML2910	Industrial Exposure	CSE	2			0	2	0	0	100	0	0	0	100
	Total						**29**	**26**							**1000**
4	SESH2080	Statistics for Machine Learning	SH	3	0	2	5	5	40	60	0	0	50	0	150
	SECE3011	Computer Networks	CE	3	2	0	5	4	40	60	20	30	0	0	150
	SECE2090	Introduction to Data Science	CE	2	4	0	6	4	40	60	40	60	0	0	200
	SECE2100	Introduction to Javascript	CE	2	4	0	6	4	40	60	40	60	0	0	200
	CFLS3010	Foreign Language-I	CFLS	2			2	2	40	60	0	0	0	0	100
	SEPD3050	Integrated Personality DevelopmentCourse-II	SEPD	2	0	0	2	1	100	0	0	0	0	0	100
	SEML2920	Project – I	CSE	4			4	4	0	0	100	0	0	0	100
	Total						**30**	**24**							**1000**

P P Savani University
School of Engineering

Department of Science & Humanities

Course Code: SESH2070
Course Name : Mathematical Methods for Machine Learning
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	05	40	60	--	--	50	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objectives of the Course:

- Orientation of calculus and its applications in solving engineering problems involving differential equations.
- Introduction of partial differential equations with methods of its solutions.
- Introduction of periodic functions and Fourier series with their applications for solving ODEs.
- apply concepts of linear algebra for solving science and engineering problems.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Ordinary Differential Equation** First order ODEs, Formation of differential equations, Solution of differential equation, Solution of equations in separable form, Exact first order ODEs, Linear first order ODEs, Bernoulli Equation, ODEs of Second and Higher order, Homogeneous linear ODEs, Linear Dependence and Independence of Solutions, Homogeneous linear ODEs with constant coefficients, Differential Operators Nonhomogeneous ODEs, Undetermined Coefficients, Variation of Parameters.	10	20
2.	**Partial Differential Equation** Formation of First and Second order equations, Solution of First order equations, Linear and Non-liner equations of first, Higher order equations with constant coefficients, Complementary function, Particular Integrals.	06	15
3.	**Fourier Series** Periodic function, Euler Formula, Arbitrary Period, Even andOdd function, Half-Range Expansions, Applications to ODEs.	07	15
Section II			
Module No.	Content	Hours	Weightage (In %)

4.	**Vector Calculus and its Applications** Vector & Scalar functions and Fields, Curve, Arc length, Curvature & Torsion gradient of scalar field, Directional derivative divergence of a vector field, Curl of a vector field	11	25
5.	**Integral Calculus** Line integrals, Path Independence of line integrals, Green`stheorem in the plane, Surface integrals, Divergence theorem ofGauss, Stokes`s theorem	11	25
	TOTAL	45	100

List of Tutorials:

Sr No	Name of Tutorial	Hours
1.	Ordinary Differential Equation-1	02
2.	Ordinary Differential Equation-2	02
3.	Ordinary Differential Equation-3	04
4.	Partial Differential Equation-1	02
5.	Partial Differential Equation-2	04
6.	Fourier Series-1	02
7.	Fourier Series-2	02
8.	Vector Calculus-1	02
9.	Vector Calculus-2	03
10.	Integral Calculus-1	03
11.	Integral Calculus-2	04
	TOTAL	30

Text Book:

Title	Author/s	Publication
Advanced Engineering Mathematics	Erwin Kreyszig	Wiley India Pvt. Ltd.
Thomas' Calculus	George B. Thomas, Maurice D. Weir and Joel Hass	Pearson
Elementary Linear Algebra	Howard Anton and Chrish Rorres	Wiley

Reference Books:

Title	Author/s	Publication
Higher Engineering Mathematics	B. S. Grewal	Khanna Publishers
Advanced Engineering Mathematics	R. K. Jain, S.R.K. Iyengar	Narosa Publishing HousePvt. Ltd.
Differential Equations for Dummies	Steven Holzner	Wiley India Pvt. Ltd.
Higher Engineering Mathematics	H.K. Dass, Er. Rajnish Verma	S. Chand & Company Pvt.Ltd.
Advanced Engineering Mathematics	E Kreyszig	John Wiley and Sons
Higher Engineering Mathematics	B. V. Ramana	Tata McGraw Hill
Linear Algebra and its Applications	David C. Lay	Pearson
Introduction to Linear Algebra with Application	Jim Defranza Daniel Gagliardi	Tata McGraw Hill
Elementary Linear Algebra	Ron Larson	Cengage Learning

Web Material Links:

- http://nptel.ac.in/courses/111105035/
- http://nptel.ac.in/courses/111106100/
- http://nptel.ac.in/courses/111105093/
- http://nptel.ac.in/courses/111108081/
- http://nptel.ac.in/courses/111106051/
- http://nptel.ac.in/courses/111108066/
- http://nptel.ac.in/downloads/111102011/
- http://epgp.inflibnet.ac.in/view_f.php?category=1564

Course Evaluation:

Theory:

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

Tutorial:

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

Course Outcomes:

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

SESH2070	**MATHEMATICAL METHODS FOR MACHINE LEARNING**
CO 1	Infer the 1st and 2nd order ode and pde.
CO 2	Examine engineering problems (growth, decay, flow, spring and series/parallel electronic circuits) using 1st and 2nd order ode.
CO 3	Classify differential equations and solve linear and non linear partial differential equations.
CO 4	Apply differential equations to investigate and solve relevant real world problems.

Mapping of CO with PO

SESH2070	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3		1								
CO 2	3	3		1	3							1
CO 3	3	3	2	1	3							2
CO 4	3	1			1							2

Mapping of CO with PSO

SESH2070	PSO1	PSO2	PSO3
CO 1	2	1	
CO 2	2	1	
CO 3	2	1	
CO 4	2	1	

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Ordinary Differential Equation	1, 2, 3, 5
2	Partial Differential Equation	1, 2, 4, 5
3	Fourier Series	1, 2, 3, 4, 5
4	Vector Calculus and its Application	1, 2, 3, 5
5	Integral Calculus	1, 2, 3, 5

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE2071
Course Name: Data Structures & Algorithms
Prerequisite Course(s): SECE1050 Programming for Problem Solving

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 linear and non-linear data structures and its applications
- analyze various searching and sorting algorithms and its impacts on data structures.
- develop logic building and problem-solving skills.
- calculate time complexity and space complexity of any algorithm

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Stack and Queue** Stack Definition and concepts, Operations on stack, Programming Stack using Array in C, Prefix and Postfix Notations and their Compilation, Representation of Queue, Operation on Queue, Programming Queue using Array in C. Types of Queue: linear, circular and priority queue	07	15
2.	**Linked List-Part I** Dynamic Memory Allocation, Structure in C, Singly Linked List, Doubly Linked List, circular linked list Linked List-II and Applications of Linked List Linked implementation of Stack, Linked implementation ofQueue, Applications of Linked List	08	15
3.	**Trees and Graphs** Graph Definition, Concepts and Representation, Types of Graphs, Tree Definition, concepts and Representation. Binary Tree, Binary Tree Traversals, Binary Search Tree, Breadth FirstSearch, Depth First Search, Spanning Tree, Kruskal's and Prim's Minimum Cost Spanning Tree Algorithms, Dijkstra's Shortest Path Algorithm	08	20

Section II			
Module No.	Content	Hours	Weightage in %
4.	**Hashing** The Symbol Table Abstract Data Types, Hash Tables, Hashing Functions, Hash collision Resolution Technique, Linear Probing	04	05
5.	**Searching and Sorting** Linear Search, Binary Search, Bubble Sort, Insertion Sort,Selection Sort, Radix sort	05	10
6.	**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	06	15
7.	**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 sequencing with deadlines, Huffman Coding: greedy method, Minimum cost spanning trees: Prim's and Kruskal's Algorithm, Single source shortest path	07	20
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Introduction to Dynamic Memory Allocation	02
2.	Implementation of Structures in C	02
3.	Implementation of various searching and sorting algorithms	06
4.	Implementation of Stacks & Queues Operations	04
5.	Implementation of Linked List Operations	04
6.	Implementation of various operations of Trees and Graphs	04
7.	Implementation of a Divide and conquer algorithm	04
8.	Implementation of a greedy algorithm	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
An Introduction to Data Structures with Applications	Jean-Paul Tremblay, Paul G. Sorenson	Tata McGraw Hill
Fundamentals of Computer Algorithms	Ellis Horowitz, SaratajSahni, S.Rajasekaran	Universities Press

Reference Book(s):

Title	Author/s	Publication

Data Structures using C & C++	Tanenbaum	Prenctice-Hall
Fundamentals of Computer Algorithms	E. Horowitz, S. Sahni, and S. Rajsekaran	Galgotia Publication
Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein	PHI

Web Material Link(s):

- https://nptel.ac.in/courses/106/102/106102064/
- https://www.tutorialspoint.com/data_structures_algorithms/index.htm

Course Evaluation:

Theory:

- Continuous Evaluation consists of one test of 60 marks and 2 hour of duration, which 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 Consist of Performance of Practical which should 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 of 15 Marks during End Semester Exam.
- Viva/Oral performance of 15 Marks during End Semester Exam.

Course Outcome(s):

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

SECE2071	**DATA STRUCTURES & ALGORITHMS**
CO 1	Identify and analyze the appropriate data structures for the solution of a given problem.
CO 2	State the real time applications of data structures.
CO 3	Observe algorithms using appropriate design techniques.
CO 4	Apply algorithm design techniques to solve real world problems.
CO 5	Construct logic building and problem solving skills.

Mapping of CO with PO

SECE2071	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	1										
CO 2												
CO 3	1	1	1	1								
CO 4		1	1	1								
CO 5		1										

Mapping of CO with PSO

SECE2071	PSO1	PSO2	PSO3

CO 1	**1**		1
CO 2		1	1
CO 3		1	
CO 4		1	2
CO 5		1	3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Stack and Queue	2, 3, 4
2	Linked List-Part I	1, 2, 3, 4
3	Trees and Graphs	2, 3, 4
4	Hashing	1, 2
5	Searching and Sorting	2, 3, 4
6	Divide and Conquer algorithmic design method	2, 3, 4
7	Greedy Method	2, 3, 4

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE2080
Course Name : Application Based Programming in python
Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand basics of object-oriented programming.
- identify appropriate approach to computational problems.
- develop logic building and problem-solving skills.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Python** History, Features of Python, Applications of Python, Working with Python, Input and Output functions in Python, Variable types, basic operators and types of data int, float, complex, string, list, tuple, set, dictionary and its methods.	03	10
2.	**Decision Structures in Python** 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.	04	05
3.	**Array and Strings in Python** Arrays, Basic strings, Accessing Strings, Basic Operations,String slicing, Testing, searching and manipulating strings, Function and methods.	03	10
4.	**Dictionary, List, Tuples and Sets** Dictionaries, accessing values in dictionaries, Working with dictionaries, properties, Functions and methods. Sets, accessing values in set, working with set, properties, functions and methods. Tuple, Accessing tuples, Operations, Working, Functions and	06	15

	Methods. List, Accessing list, Operations, Working with lists, Function and Methods, Two-dimensional Lists.		
5.	**Functions, Modules and Packages in Python** Introduction to functions, defining a function, Calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables Importing module, Math module, Random module, Introduction to Packages: numpy, pandas, matplotlib.	07	10
	Section II		
Module No.	Content	Hours	Weightage in %
6.	**Python Object Oriented Programming** OOP Concept of class, object and instances, Constructor, class, attributes, methods, using properties to control attribute access, and destructors, Inheritance, overlapping and overloading operators. (29-36) 16-4-19 Objects in Python: creating Python classes, Modules and Packages, Inheritance in Python, Polymorphism in Python.	05	10
7.	**Files in Python** Introduction to file input and output, Writing Data to a File, Reading Data From a File, Additional File Methods, Usingloops to process files, Processing records.	04	05
8.	**Building Desktop Application** RE module, basic patterns, Regular expression syntax, Regular expression object, Match object, Search object, findall method, split method, sub method.	06	15
9.	**Building Web Application** Parts of a Web Application, The Client-Server Relationship, Middleware and MVC, HTTP Methods and Headers, What Is an API?Web Programming with Python , Using the Python HTTP, Creating an HTTP Server, Exploring the Flask Framework, Creating Data Models in Flask, Creating Core Flask Files,	07	20
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to Python (Introduction to IDLE, different data types, InputOutput in Python, Operators, Operator precedence).	10
2.	Working with Strings.	08
3.	Implementation of Dictionaries, Sets, Tuples and Lists and its various methods in Python.	10
4.	Working with decision structures in Python	08
5.	Working with functions and modules in Python	04
6.	Working with Object-oriented paradigms in Python	06
7.	Implementation of file handling in Python.	04
8.	Building desktop application in Python.	04

9.	Building web application in Python.	06
	TOTAL	60

 # Use of different libraries will be covered in Practical Assignments.

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
Python Projects	Laura Cassell, Alan Gauld	Wrox, Wiley Publication

Reference Book(s):

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

Web Material links:

- 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 and average of the same will be converted out of 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 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 this course, the students will be to,

SECE2080	APPLICATION BASED PROGRAMMING IN PYTHON
CO 1	Understand the syntax and semantics of the python language.
CO 2	Apply the concepts of object oriented programming language by developing user friendly programs.
CO 3	Create efficient programs with own logic & capabilities using python language.
CO 4	Develop projects using in built tools to solve real world computing problems.

Mapping of CO with PO

SECE2080	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2				3							
CO 2	2	1	2	3	3							
CO 3	2	3	2	3	3							
CO 4	2	3	2	3	3				1			3

Mapping of CO with PSO

SECE2080	PSO1	PSO2	PSO3
CO 1	3	3	
CO 2	3	3	
CO 3	3	3	**1**
CO 4	3	3	**3**

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction to Python	1, 2
2	Decision Structures in Python	1, 2, 3
3	Array and Strings in Python	1, 2, 3
4	Dictionary, List, Tuples and Sets	2, 3, 4
5	Functions, Modules and Packages in Python	2, 3, 4
6	Python Object Oriented Programming	2, 3, 4
7	Files in Python	2,3,4
8	Building Desktop Application	3,4,5
9	Building Web Application	3,4,6

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE2111
Course Name: Database Management System
Prerequisite Course: 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	
03	02	--	04	40	60	20	30	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

- learn the basic concept of database design and development of database management system.
- understand Query processing of SQL.
- understand the importance of back-end design and relational database management System (RDBMS).

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	Introduction File Organization, Comparison of File with DBMS, Application of DBMS, Purpose of DBMS, Views of data - level of abstraction, data independence, database architecture, database users & administrators.	04	10
2.	Relational Model Structure of relational databases, Domains, Relations, Relational algebra- operators and syntax, Relational algebra queries.	04	10
3.	SQL Concepts Basics of SQL, DDL, DML, DCL, Structure: creation, alteration, definingconstraints: Primary key, Foreign key, Unique key, Notnull, check, IN operator, Aggregate functions, Built-in functions: numeric, date, string functions, set operations, Subqueries, correlated sub-queries: Join, Exist, Any, All, view and its types. Transaction control commands- Commit,Rollback, Savepoint.	10	22

4.	Query Processing, Overview, Measures of query cost, Selection operation,Sorting, Join,Evaluation of expressions.	04	8
Section II			
Module No.	Content	Hours	Weightage in %
5.	Entity Relational Model Entity-Relationship model: Basic concepts, Design process Constraints, Keys, Design issues, E-R diagrams, Weak entity sets, extended E-R features- generalization, specialization, aggregation, reduction to E-R database Schema.	08	20
6.	Database Design Concepts Functional Dependency, definition, Trivial and non-trivial FD, Closure of FD set, closure of attributes, Irreducible set of FD, Normalization: 1NF, 2NF, 3NF, Decomposition using FD, Dependency preservation, BCNF, Multivalued dependency, 4NF Join dependency and 5NF, RAID Concepts.	07	14
7.	Transaction Management Transaction concepts, Properties of Transactions, Serializability of transactions, Testing for serializability, system recovery, Two-Phase Commit protocol, Recovery and Atomicity, Log-based recovery, Concurrent executions of transactions and related problems, Locking mechanisms, Solution to Concurrency Related Problems, Deadlock, Two-phase locking protocol.	05	10
8.	PL/SQL Concepts Cursors, Stored Procedures, Stored Function, Database Triggers, Indices.	03	6
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Introduction to DBMS, SQL, and SQL tools.	02
2.	Implementation of a client-server architecture using TightVNC Server and Client software (remote access of a server by clients)	02
3.	Introduction to Data Dictionary concepts.	02
4.	Create all the master tables using Data Definition Language Commands like Create and Describe.	02
5.	Implement the use of alter table command.	02
6.	Introduction to Transaction Control Commands like Commit, Rollback and Save point.	02
7.	Use insert command to add data into created tables.	02
8.	Solve queries using update command.	02
9.	Implement SQL queries based on update and delete command.	02
10.	Write SQL queries to solve problems with the use of the select command.	02

11.	Generate different reports using select command.	02
12.	Introduction to SQL functions.	02
13.	Write SQL scripts to implement the listed queries, which require the usage of numerous SQL functions.	02
14.	Introduction to group functions and demonstration of their usage.	02
15.	Implement queries based on group by and having a clause.	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Database System Concept	Abraham Silberschatz, Henry F. Korth, S.Sudarshan	McGraw Hill
SQL, PL/SQL-The Programming Language of Oracle	Ivan Bayross	BPB Publications

Reference Book(s):

Title	Author/s	Publication
An Introduction to Database system	C J Date	Addition-Wesley
Fundamental of Database system	R. Elmasri and S.B Navathe	The Benjamin/Cumming
SQL, PL/SQL the Programming Languageof Oracle	Ivan Bayross	BPB Publications
Oracle: The Complete Reference	George Koch, Kevin Loney	TMH /Oracle Press

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 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks.
- External viva consists of 30 marks.

Course Outcome(s):

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

SECE2111	DATABASE MANAGEMENT SYSTEM
CO 1	Understand the importance of back end design and relational database management system.
CO 2	Apply physical data, conceptual data and its conversion into relational databases.

CO 3	Practice various database constraints on relational databases.
CO 4	Design and develop database for the software projects.

Mapping of CO with PO

SECE2111	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	1			3					1		3
CO 2	3	1		1	1							1
CO 3	2	1	1	1						1		1
CO 4	3	3	3	3	3					2	2	2

Mapping of CO with PSO

SECE2111	PSO1	PSO2	PSO3
CO 1	2	1	2
CO 2	2	1	2
CO 3	2	1	2
CO 4	3	2	2

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	1, 2
2	Relational Model	2, 4
3	SQL Concepts	3 ,4, 6
4	Query Processing	2, 5
5	Entity Relational Model	2, 3, 6
6	Database Design Concepts	2, 3, 5
7	Transaction Management	2, 4
8	PL/SQL Concepts	3, 4, 6

P P Savani University
School of Engineering

Department of Information Technology

Course Code: SEIT2031
Course Name: Operating System
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	
03	02	--	04	40	60	20	30	--	--	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 hardware processes and its life cycle.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** What is OS? History of OS, Types of OS, Concepts of OS.	02	06
2.	**Processes and Threads Management** Process Concept, process state, process control block, CPU Scheduling: CPU-I/O burst cycle, types of schedulers, context switch, Preemptive Scheduling, Dispatcher, Scheduling criteria; Scheduling algorithms: FCFS, SJF, Priority scheduling, Round-Robin scheduling, Multilevel queue scheduling; Threads, Types of Threads, Multithreading	10	20
3.	**Inter Process Communication** Race Conditions, Critical Regions, Mutual exclusion with busy waiting, sleep and wakeup, semaphores, mutexes, monitors, message passing, barriers; Classical IPC Problems: The dining philosopher problem, The readers and writers' problem.	06	14
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 %
5.	**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, LRU; Allocation of frames, Thrashing.	12	25
6.	**File Management** Introduction; Files: naming, structure, types, access, attributes, operations; Directories: single level, hierarchical, path names, directory operations; File Allocation Methods: Contiguous Allocation, Linked Allocation, Indexed Allocation	06	13
7.	**Disk Management** Disk structure, Disk arm Scheduling Algorithms: FCFS, SSTF, SCAN, C-SCAN, LOOK, C-LOOK,; Disk Free Space Management,RAID	05	12
	TOTAL	45	100

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 numbers,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, 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
	TOTAL	30

Text Book(s):

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

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/106106144/

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted out of 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 per each practical. At the end of the semester, 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 Exam.
- Viva/Oral performance consists of 15 marks during End Semester Exam.

Course Outcome(s):

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

SEIT2031	**OPERATING SYSTEM**
CO 1	Understand the basic principles of operating system.
CO 2	Illustrate the concepts of operating systems services and its components.
CO 3	Evaluate the performance of operating system algorithms.
CO 4	Apply various operating system algorithms on real life problems.

Mapping of CO with PO

SEIT2031	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1											
CO 2		1			1							
CO 3	1	1			1							
CO 4		1			1							

Mapping of CO with PSO

SEIT2031	PSO1	PSO2	PSO3
CO 1	1	1	2
CO 2	1	1	2
CO 3		1	2
CO 4		1	2

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction	1, 2, 4
2	Processes and Threads Management	1, 2, 3, 5, 6
3	Inter Process Communication	2, 3, 4, 5
4	Deadlocks	2, 3, 4, 6
5	Memory Management	1, 2, 3, 4, 6
6	File Management	1, 2, 3
7	Disk Management	1, 2, 3, 4, 5

P P Savani University
School of Engineering

Department of Computer Science Engineering (Ml & AI)

Course Code: SEML2910
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	
--	02	--	02	--	--	100	--	--	--	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):

SEML2910	INDUSTRIAL EXPOSURE
CO1	Construct company profile by compiling brief history, management structure, products/services offered, key achievements and market performance for the company visited during internship.
CO2	Determine the challenges and future potential for his/her internship organization in particular and the sector in general.
CO3	Test the theoretical learning in practical situations by accomplishing the tasks assigned during the internship period.
CO4	Apply various soft skills such as time management, positive attitude and communication skills during performance of the tasks assigned in internship organization.

CO5	Analyze the functioning of internship organization and recommend changes for improvement in processes.

Mapping of CO with PO

SEML2910	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1			1			3	2			1		
CO 2		1	1			2	1			1	1	1
CO 3	2	2		3	2	2	1	1		1	1	3
CO 4								1	3	3		1
CO 5	2	1	1	1		2	3			1	1	2

Mapping of CO with PSO

SEML2910	PSO1	PSO2	PSO3
CO 1	1	2	2
CO 2	1	2	1
CO 3	3	3	3
CO 4			1
CO 5		2	1

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 andenrollment 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 Science & Humanities

Course Code: SESH2080
Course Name : Statistics for Machine Learning
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	05	40	60	--	--	50	--	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 Science.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Data & Descriptive Statistics** Elements, Variables, and Observations, Scales of Measurement , Categorical and Quantitative Data, Cross- Sectional and Time Series Data, Summarizing Categorial Data and Quantitative Data, Frequency Distribution, Relative Frequency and Percentage Distributions, Bar Charts and Pie Charts, Dot Plot, Histogram, Cumulative Distributions, Ogive, Measures of Location: Mean, Median, Mode, Percentiles and Quartiles, Measures 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			
4.	**Introduction to Probability** Experiments, Counting Rules, Assigning Probabilities, Events and their Probabilities, Relationships of Probabilities, Conditional Probability, Bayes' Theorem	06	10

5.	**Discrete and Continuous Probability Distribution** Random Variables, Discrete Probability Distributions, Expected Values and variance, Binomial Probability Distribution, Poisson Probability Distribution, Uniform Probability Distribution, Normal Probability Distribution.	10	25
6.	**Testing of Hypothesis** Introduction, Sampling, Tests of Significance, Null Hypothesis, Alternative Hypothesis, Type 1 and Type 2 errors, Level of Significance, Chi-square test, Student's *t*-test, Seducer's *F*-test.	07	15
	TOTAL	45	100

List of Toturial:

Sr. No	Name of Tutorial	Hours
1.	Introduction to Data & Descriptive Statistics-1.	02
2.	Introduction to Data & Descriptive Statistics-2.	02
3.	Introduction to Data & Descriptive Statistics-3.	04
4.	Exploratory Data Analysis.	04
5.	Correlation Analysis	04
6.	Introduction to Probability	04
7.	Discrete and Continuous Probability Distribution-1.	02
8.	Discrete and Continuous Probability Distribution-2.	02
9.	Discrete and Continuous Probability Distribution-3.	02
10.	Testing of Hypothesis	04
	TOTAL	30

Text Book:

Title	Author/s	Publication
Statistics for Business and Economics	David R. Anderson, Dennis J. Sweeney, Thomas A. Williams	Cengage Learning

Reference Book:

Title	Author/s	Publication
Understandable Statistics Concepts and Methods	Charles Henry Brase Corrinne Pellillo Brase	Houghton Mifflin Company

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests, each 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 the 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 based examination consists of 10 marks.
- Internal Viva consists of 10 Marks.

Course Outcomes(s):

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

SESH2080	STATISTICS FOR MACHINE LEARNING
CO1	Elaborate analysis of categorial data and quantitative data.
CO2	Examine the box plot for real data and able to find the outliers.
CO3	Adapt the knowledge of various probability distribution and their applications in mathematical models, sport strategies and insurance.
CO4	Evaluate coorrelation, regression and confidence intervals to formulate hypotheses.

Mapping of CO with PO

SESH2080	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1	1									1
CO 2	1	1										
CO 3	2	1	1									1
CO 4	2	1	1									

Mapping of CO with PSO

SESH2080	PSO1	PSO2	PSO3
CO 1	2		1
CO 2			
CO 3	1		
CO 4	2		1

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction to Data & Descriptive Statistics	1, 2
2	Exploratory Data Analysis	1, 3, 4, 5
3	Correlation Analysis	1, 2, 4, 5
4	Introduction to Probability	1, 2
5	Discrete and Continuous Probability Distribution	2, 3, 5
6	Testing of Hypothesis	1, 2, 3, 5, 6

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE3011
Course Name: Computer Network
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	--	04	40	60	20	30	--	--	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 %
5.	**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
6.	**Transport Layer** Transport services, Design issues, transport layer protocols, Congestion Control, QOS and its improvement.	06	15
7.	**Application Layer** Client-Server Model, DNS, SMTP, FTP, HTTP, WWW, and recent development	08	15
	TOTAL	45	100

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
	TOTAL	30

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.html
- 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 consist 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,

SECE3011	**COMPUTER NETWORK**
CO 1	Distinguish the working of network protocols,application and osi refernece model and tcp/ip reference model.
CO 2	Explain various service provided by computer network and its uses.
CO 3	Describe concept of network interface and performance issues in the networks.
CO 4	Evaluate network tools for implementing network protocols.

Mapping of CO with PO

SECE3011	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	3	2	3	3	3	2			3		1
CO 2		3	3	2	3	2	3			3		2
CO 3	1	3	2	3	3	3	3			2		3
CO 4	1	3	3	3	3	3	2			2		3

Mapping of CO with PSO

SECE3011	PSO1	PSO2	PSO3
CO 1	2	3	3
CO 2	3	3	2
CO 3	3	3	3
CO 4	3	3	2

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	2,4
2	Physical Layer	1,2,4
3	Data Link Layer	2,4

4	Medium Access SubLayer	1,2
5	Network Layer	2,3,6
6	Transport Layer	2,4
7	Application Layer	2,5

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE2090
Course Name: Introduction to Data Science
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	--	04	40	60	40	60	--	--	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand the role of data scientist.
- understand data collection and preprocessing models.
- perform model development and visualization.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction:** Introduction to Data Science; Evolution of Data Science; Data Science Roles; Stages in a Data Science Project; Applications of Data Science in various fields; Data Security Issues.	04	15
2.	**Data Collection and Data Pre-Processing:** Data Collection Strategies; Data Pre-Processing Overview; Data Cleaning; Data Integration and Transformation; Data Reduction; Data Discretization.	06	15
3.	**Exploratory Data Analytics:** Descriptive Statistics; Mean, Standard Deviation, Skewness and Kurtosis; Box Plots; PivotTable; Heat Map; Correlation Statistics; ANOVA.	05	20
Section II			
4.	**Model Development:** Simple and Multiple Regression; Model Evaluation using Visualization; Residual Plot; Distribution Plot; Polynomial Regression and Pipelines; Measures for In-sample Evaluation; Prediction and Decision Making	07	25

5.	**Model Evaluation:** Generalization Error; Out-of-Sample Evaluation Metrics; Cross Validation; Overfitting; Under Fitting and Model Selection; Prediction by using Ridge Regression; Testing Multiple Parameters by using Grid Search.	08	25
	TOTAL	30	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Introduction to Jupyter Notebook	02
2.	Basic Statistics and Visualization in Python	04
3.	K-means Clustering	04
4.	Association Rules	06
5.	Linear Regression	06
6.	Logistic Regression	06
7.	Naive Bayesian Classifier	06
8.	Decision Trees	06
9.	Simulate Principal component analysis	10
10.	Simulate Singular Value Decomposition	10
	TOTAL	60

Reference Book(s):

Title	Author/s	Publication
Python Data Science Handbook: Essential Tools for Working with Data	Jake VanderPlas	O'Reilly
Doing Data Science: Straight Talk from the Frontline	Rachel Schutt, Cathy O'Neil	O'Reilly
Storytelling with Data: A Data Visualization Guide for Business	Cole Nussbaumer Knaflic	Wiley

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests, each of 30 marks and 1 hour of duration and average of the same will be converted out of 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 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,

SECE2090	INTRODUCTION TO DATA SCIENCE
CO1	Understand the fundamental principles of data science.
CO2	Perform statistical analysis of data.
CO3	Recall , build and assess data based models.
CO4	Apply different techniques to analysed, evaluated, deployed and visualized data.
CO5	Collect and manage data to devise solutions to data science tasks.

Mapping of CO with PO

SECE2090	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1										
CO 2	2	2	1	1	1					2	1	
CO 3	2	2	2	2	3					3	2	1
CO 4	2	3	2	3	3					3	2	3
CO 5	2	3	2	3	3					3	2	2

Mapping of CO with PSO

SECE2090	PSO1	PSO2	PSO3
CO 1	3	1	2
CO 2	3	1	2
CO 3	3	1	2
CO 4	3	1	2
CO 5	3	1	2

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction	1,2
2	Data Collection and Data Pre-Processing	1,2,3
3	Exploratory Data Analytics	2,3,6
4	Model Development	3,4,5
5	Model Evaluation	3,4,5

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE2100
Course Name: Introduction to JavaScript
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	--	04	40	60	40	60	--	--	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand basics of JavaScript
- identify appropriate approach to computational problems.
- develop logic building and problem-solving skills.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to JavaScript** What You Need to Know, Basic HTML and CSS Knowledge, Basic Text Editor and Web Browser, Version, Similarities to Other Languages, beginning with JavaScript Object Based, Client Side, Scripting Language, Placing Javascript in HTML	02	10
2.	**Variables and functions I Javascript** Introduction to variables, defining variables, Types, using variables in script, Introduction to function, structuringfunctions, calling functions, User defined functions.	04	15
3.	**Conditional Statements and Loops** Defining Conditional Statements, Using Conditional Statements, Defining Loops, Using Loops	03	15
4.	**Events Handlers** Introduction to Event Handlers, Location and uses, VariousEvents, Creating Scripts using Event Handler,	06	10

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Object in JavaScript** OOP Concept of class, object and instances, Constructor, class, attributes, methods, using properties to control attribute access, and Understanding Predefined JavaScript Objects.	04	10
2.	**Document Object** Introduction to document Object, Introduction about various Properties, Introduction about Methods, Creating Dynamic Scripts, Inner HTML Property.	05	05
3.	**Window Object** Introduction to document Object, Introduction about various Properties, Introduction about Methods.	03	15
4.	**JavaScript Arrays** Introduction to an Array, Defining and Accessing Arrays, Understanding the Properties and Methods of the Array Object, Using Arrays with Loops, Using Associative Arrays,	03	20
	TOTAL	30	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to JavaScript (Introduction to JavaScript, different data types, Operators, Operator precedence).	10
2.	Working with Variables and functions.	08
3.	Implementation of Conditional Statements and Loops	10
4.	Working With Event Handlers	08
5.	Working with Objects in JavaScript	06
6.	Working with JavaScript Document Object	06
7.	Working with JavaScript Window Object	06
8.	Working with JavaScript Arrays	06
	TOTAL	60

 # Use of different libraries will be covered in Practical Assignments.

Text Book(s):

Title	Author/s	Publication
JavaScript A Beginner's Guide	John Pollock	Mc Graw Hil

Reference Book(s):

Title	Author/s	Publication
JavaScript: The Definitive Guide	David Flanagan	O'Reilly

Web Material links:

- https://www.tutorialspoint.com/javascript/
- https://www.w3schools.com/js/

Course Evaluation:
Theory:

- Continuous Evaluation consists of two tests, each of 30 marks and 1 hour of duration and average of the same will be converted out of 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 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 this course, the students will be to,

SECE2100	**INTRODUCTION TO JAVASCRIPT**
CO 1	Illustrate the syntax and semantics of the 'javascript' language.
CO 2	Differentiate client side and server side scripting language.
CO 3	Create efficient programs with own logic & capabilities using javascript utilities.
CO 4	Implement interactive web pages.
CO 5	Learn to use best practice idioms and patterns.

Mapping of CO with PO

SECE2100	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1		1	1									
CO 2	1	1										
CO 3	2	2	1		1						2	
CO 4	2	2	2		1				3	1	1	
CO 5	2	1	1							1		

Mapping of CO with PSO

SECE2100	PSO1	PSO2	PSO3
CO 1			1
CO 2			1
CO 3	3		2
CO 4	3		2
CO 5			2

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction to JavaScript	2,3,4
2	Variables and functions In Javascript	1,2,4
3	Conditional Statements and Loops	2,4,5
4	Event Handlers	2,4,6
5	Object in JavaScript	2,6
6	Document Object	2,4,5
7	Window Object	2,4,5
8	JavaScript Arrays	1,2,3,6

P P Savani University
School of Engineering

Department of Computer Science & Engineering (ML & AI)

Course Code: SEML2920
Course Name: Project-I
Prerequisite Course(s): --

Teaching & Examination Scheme:

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

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 Project-I:

Sr. No	Project-I 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
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.
2.	**Literature Review** Study of various technology or area to select a topic of the seminar.
3.	**Gap identification and Proposal** Students must identify the gaps in the existing research and design a proposalwhich will help in overcome the same.

4.	**Implementation** Students must implement their proposal in any of the programminglanguages.
5.	**Report Writing** The report must be prepared as per suggested guidelines consisting ofPreamble, Objectives, Scope, Introduction, Conclusions, Recommendations and Annexure.
6.	**Presentation & Question-Answer** At the end of the semester, the student/group of students shall give apresentation of their work followed by a viva-voce examination.

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 work 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

The entire evaluation will be converted equivalent to 100 Marks.

Course Outcome(s):

SEML2920	PROJECT – I
CO 1	Distinguish and analyze the issues related to various existing system.
CO 2	Support the theoretical learning with practice and integrate knowledge for engineering applications.
CO 3	Experiment on problem with the help of latest technologies.
CO 4	Prepare professional work reports and presentations.

Mapping of CO with PO

SEML2920	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1	1	2	1			1				2
CO 2	1	2	1	2	1					1	2	
CO 3	1	2	1	2	1					1	2	
CO 4						2	1					

Mapping of CO with PSO

SEML2920	PSO1	PSO2	PSO3
CO 1	1	2	2
CO 2	1	1	1
CO 3	1	1	1
CO 4			

THIRD YEAR B.TECH.

P P SAVANI UNIVERSITY															
SCHOOL OF ENGINEERING															
TEACHING & EXAMINATION SCHEME FOR THIRD YEAR B.TECH. COMPUTER SCIENCE ENGINEERING (MLAI) PROGRAMME AY: 2021-22															
Sem	**Course Code**	**Course Title**	**Offered By**	**Teaching Scheme**					**Examination Scheme**						
				Contact Hours				**Credit**	**Theory**		**Practical**		**Tutorial**		**Total**
				Theory	**Practical**	**Tutorial**	**Total**		**CE**	**ESE**	**CE**	**ESE**	**CE**	**ESE**	
5	SEIT3081	Mobile Application Programming	IT	2	4	0	6	4	40	60	40	60	0	0	200
	SEML3011	Artificial Intelligence & Machine Learning-II	CE	2	4	0	6	4	40	60	40	60	0	0	200
	SECE3060	Image processing with Python	CE	3	4	0	7	5	40	60	40	60	0	0	200
	CFLS3021	Foreign Language-II	CFLS	2	0	0	2	2	40	60	0	0	0	0	100
	SEPD3050	Integrated Personality Development Course-II	SEPD	2			2	1	100	0	0	0	0	0	100
	SEML3910	Summer Training	CSE	4			0	4	0	0	100	0	0	0	100
	SEML3920	Project – II	CSE	4			4	4	0	0	100	0	0	0	100
						Total	**27**	**24**							**1000**
6	SECE4022	Cloud Computing & Applications	CE	3	2	0	5	4	40	60	20	30	0	0	150
	SECE3051	System Programming	CE	3	2	0	5	4	40	60	20	30	0	0	150
	SECE3070	3D Modeling and Rendering	CE	2	2	0	4	3	40	60	20	30	0	0	150
	SEPD3020	Corporate Grooming & Etiquette	SEPD	1	2	0	3	2	0	0	50	50	0	0	100
	SEML3930	Project – III	CSE	4			4	4	0	0	100	0	0	0	100
	SEML3490	Online NPTEL Course	CSE	3			3	3	100	0	0	0	0	0	100
		Elective – I		2	2	0	4	3	40	60	20	30	0	0	150
						Total	**28**	**23**							**900**

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	
6	SECE3550	Optimization Techniques	CE	2	2	0	4	3	40	60	20	30	0	0	150
	SECE3560	Business Analytics	CE	2	2	0	4	3	40	60	20	30	0	0	150
	SECE3520	Service Oriented Architecture	CE	2	2	0	4	3	40	60	20	30	0	0	150
	SECE3570	NO SQL with MongoDB	CE	2	2	0	4	3	40	60	20	30	0	0	150
	SECE3580	R Programming	CE	2	2	0	4	3	40	60	20	30	0	0	150

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT3081
Course Name: Mobile Application Programming
Prerequisite Course(s): Object Oriented Programming with Java (SEIT1031)

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	--	04	40	60	40	60	--	--	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help 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, Downloading and Installing Android Studio, Exploring Android SDK, Android Development Tools and the Android Emulator, Build the First Android application, Android Terminologies, Application Context, Application Tasks with Activities, Intents, and Closer Look at Android Activities.	03	10
2.	**Android Application Design and Resource** Anatomy of an Android Application, Android Manifest file, Editing the Android Manifest File, Managing Application's Identity, Enforcing Application System Requirements, Registering Activities and other Application Components, Working with Permissions.	02	10
3.	**Exploring User Interface Screen Elements** Introducing Android Views and Layouts, Displaying Text with TextView, Retrieving Data from Users, Using Buttons, Check Boxes and Radio Groups, Getting Dates and Times from Users, Using Indicators to Display and Data to Users, Adjusting Progress with SeekBar, Providing Users with Options and Context Menus, Handling User Events, Working with Dialogs, Working with Styles, Working with Themes.	06	15
4.	**Designing User Interfaces with Layouts**	04	15

	Creating User Interfaces in Android, View versus View Group, Using Built-In Layout Classes such as Fame Layout, Linear Layout, Relative Layout, Table Layout, Multiple Layouts on a Screen, Data-Driven Containers, Organizing Screens with Tabs, Adding Scrolling Support.		
Section II			
Module No.	Content	Hours	Weightage in %
5.	**Activity and Multimedia with database** Intent, Intent Filter, Broadcast Lifecycle, Content Provider, Fragments, Services: Features of Service, Android Platform service, defining new service, Service Lifecycle, Permission, example of Service, Multimedia framework, Play Audio and Video, Text to speech, Sensors, Async tasks, Audio Capture, Camera, Bluetooth, Animation, SQLite Database, necessity of SQLite, Creation and connection of the database, extracting value from cursors, Transactions.	08	25
6.	**Sending SMS, Email and Location Based Services** SMS Telephony, Sending Email, Location Based Services: Creating the project, getting the maps API key, Displaying the map, Displaying the zoom control, navigating to a specific location, adding markers, getting location, Geocoding and reverse Geocoding, Getting Location data, Monitoring Location.	04	15
7.	**Security and Application Deployment** Android Security Model, Declaring and Using Permissions, Using Custom Permission, Application Deployment: Creating small application, signing of application, deploying app on Google Play Store, Become a Publisher, Developer Console.	03	10
	TOTAL	30	100

List of Practical:

Sr No	Name of Practical	Hours
1	Create Hello World Application.	02
2	Create login application where you will have to validate 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 UI component: ImageButton, Togglebutton, ProgressBar,	04
7.	Create an application UI component: Spinner, DatePicker, TimePicker, SeekBar	04
8.	Create an application UI component: Switch, RatingBar	04

9.	Using content providers and permissions, read phonebook contacts using content providers and display in list.	04
10.	Create an app to send SMS and email	04
11.	Database Connectivity	04
12.	Create an application to make Insert, Update, Delete and Retrieve operation on the database.	06
13.	Create an application that will play a media file from the memory card.	04
14.	Create application using Google speech API	06
15.	Create application using Google maps API	06
	TOTAL	60

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

Web Material Link(s):

- https://nptel.ac.in/courses/106106156/

Course Evaluation:

Theory:

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

Practical:

- Continuous Evaluation consists of performance of practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/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 students will be able to,

SEIT3081	MOBILE APPLICATION PROGRAMMING
CO 1	Develop user friendly mobile applications by implementing different practicals.
CO 2	Understand the concepts of front end development using various technologies.
CO 3	Analyse and implement frameworks, database and design patterns in mobile applications.
CO 4	Create a small but realistic working mobile application using different application programming interface.

Mapping of CO with PO

SEIT3081	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1		3	3	2	1	3	3			2	2	1
CO 2		3	3	2	1	3	3			2	2	1
CO 3		3	3	2	1	3	3			2	2	1
CO 4		3	3	2	1	3	3			2	2	1

Mapping of CO with PSO

SEIT3081	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction of Android	1,2
2	Android Application Design and resource	1,6,3
3	Exploring user interface Screen Elements	5,3,6
4	Designing user interface Screen elements	6,4,3
5	Activity and multimedia with database	3,5,6
6	Sending SMS, Email and location Based services	4,6,3
7	Security and Application Deployment	6,5,3,4

P P Savani University

School of Engineering

Department of Computer Science & Engineering (ML & AI)

Course Code: SEML3011

Course Name: Artificial Intelligence & Machine Learning -II

Prerequisite Course (s): SECE2090 – Introduction to Data Science

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	--	04	40	60	40	60	--	--	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to,

- understand the basic concepts, theories and state-of-the-art techniques of artificial intelligence.
- understand basic concepts and applications of machine learning.
- learn the application of machine learning /AI algorithms in the different fields.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Artificial Intelligence:** What is an AI Technique? The AI Problems and applications, Major areas of Artificial Intelligence	02	05
2.	**Basic Problem Solving Methods and State Space Search** Defining the Problems as a State Space Search, Exhaustive search -BFS, DFS, Bidirectional Search, Heuristic search - Hill Climbing, Best First Search, A* search algorithm.	07	25
3.	**Knowledge Representation** Knowledge representation as propositional logic, predicate logic, Semantic Network, Frame based knowledge.	06	20
Section II			
4.	**Bayesian Learning** Bayes Theorem, Maximum Likelihood and Least squared Error Hypothesis, Maximum likelihood hypothesis for Predicting probabilities, Minimum Description Length, Principle, Bayes Optimal Classifier, Gibbs Algorithm, Naive Bayes Classifier. Case Study: Learning to classify text.	05	20
5.	**Unsupervised learning** Unsupervised learning, Applications, challenges, K- Nearest Neighbor Learning Locally Weighted Regression, SVM, Apriori Algorithm, EM Algorithm.	05	15

6.	**Artificial Neural networks and genetic algorithms** Neural Network Representation, Appropriate problems for Neural Network Learning, Perceptron, Multilayer Networks and Back Propagation Algorithms, Remarks on Back Propagation Algorithms. Case Study: Face Recognition.	05	15
	TOTAL	30	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Write a program(s) to implement BFS and/or DFS algorithms.	06
2.	Write a program(s) to implement 8 puzzle problem or Water Jug problem or Tic-tac-toe game or any AI search problem.	06
3.	Write a program to Implement A* Algorithm.	06
4.	Implementation of knowledge representation methods	08
5.	Implementation of Bayesian Network	06
6.	Classification with k-Nearest Neighbors	04
7.	Random Forest	04
8.	Support vector machines	04
9.	Page Rank	04
10.	CART	04
11.	Implementation of Neural network-based application.	08
	TOTAL	60

Reference Book(s):

Title	Author/s	Publication
Artificial Intelligence	By Elaine Rich And Kevin Knight	(2nd Edition) Tata McGraw-Hill
Artificial Intelligence: A Modern Approach	Stuart Russel, Peter Norvig	PHI
Machine Learning	Tom M Mitchell	McGraw Hill

Web Material Link(s):

- https://nptel.ac.in/courses/106106126/
- https://www.edureka.co/post-graduate/machine-learning-and-ai?utm_source=google&utm_medium=cpc&utm_campaign=ET-PGPINML-05-Search-AI-High-Intent-Minus-18 24&gclid=EAIaIQobChMI55v6_uC55wIVjx0rCh001wW5EAAYAyAAEgJcyfD_BwE
- https://nptel.ac.in/courses/106/105/106105152/
- https://in.mathworks.com/campaigns/offers/machine-learning-with-matlab.html?gclid=EAIaIQobChMIrv2dqpOh5wIVkoiPCh0t9g8CEAAYASAAEgKl-fD_BwE&ef_id=EAIaIQobChMIrv2dqpOh5wIVkoiPCh0t9g8CEAAYASAAEgKl-fD_BwE:G:s&s_kwcid=AL!8664!3!281794527296!b!!g!!%2Bmachine%20%2Blearning&s_eid=psn_57384022552&q=+machine%20+learning

Course Evaluation:

Theory

- Continuous Evaluation Consist of Two Test Each of 30 Marks and 1 Hour of duration.

- ContinuousEvaluation will be cumulative of practical performances, activities, presentations, viva and submissions consisting of 40 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination will consist of 60 marks.

Practical

- Practical performance/quiz/drawing/test/submission of 30 marks during End Semester Exam.
- Viva/Oral performance of 30 marks during End Semester Exam.

Course Outcome(s):

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

SEML3011	**ARTIFICIAL INTELLIGENCE & MACHINE LEARNING-II**
CO1	Immediate understanding the concept of artificial intelligence and applications in real life.
CO2	Develop a search algorithm for a problem and estimate its time and space complexities.
CO3	Recalling the knowledge representation using the appropriate technique for a given problem.
CO4	Apply ai techniques to solve different problems with machine learning algorithms.
CO5	Analyze and illustrate unsupervised learning algorithms with help of various case studies.

Mapping of CO with PO

SEML3011	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	3	3	3	2	3		2	3	3	1
CO 2	3	3	2	3	3	2	3		1	3	3	3
CO 3	3	3	3	3	3	3	3		2	3	3	3
CO 4	3	3	3	3	3	3	3		2	3	3	3
CO 5	3	3	3	3	3	3	3		2	3	3	3

Mapping of CO with PSO

SEML3011	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3
CO 5	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction to Artificial Intelligence	1
2	Basic Problem Solving Methods and State Space Search	1,2,3

3	Knowledge Representation	2,3
4	Bayesian Learning	2,3
5	Unsupervised learning	2,3,6
6	Artificial Neural networks and genetic algorithms	2,3

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3060
Course Name: Image Processing with Python
Prerequisite Course(s): --

Teaching & Examination Scheme:

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

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.	04	15
2.	**Image enhancement in the Spatial domain** Basic gray level Transformations, Histogram Processing Techniques, Spatial Filtering, Low pass filtering, High pass filtering.	07	15
3.	**Filtering in the Frequency Domain:** Preliminary Concepts, Extension to functions of two variables, Image Smoothing, Image Sharpening, Homomorphic filtering.	06	10
4.	**Image Restoration and Reconstruction:** Noise Models, Noise Reduction, Inverse Filtering, MMSE (Wiener) Filtering.	06	10
Section II			
Module	Content	Hours	Weightage in %
5.	**Color Image Processing:** Color Fundamentals, Color Models, Pseudo color image processing.	03	10
6.	**Image Compression** Fundamentals of redundancies, Basic Compression Methods: Huffman coding, Arithmetic coding, LZW coding, JPEG Compression standard.	05	10
7.	**Morphological Image Processing**	03	10

	Erosion, dilation, opening, closing, Basic Morphological Algorithms: hole filling, connected components, thinning, skeleton.		
8.	**Image Segmentation** point, line and edge detection, Thresholding, Regions Based segmentation, Edge linking and boundary detection, Hough transform.	05	10
9.	**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.	06	10
	TOTAL	45	100

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.	04
3.	Implement different interpolation techniques using MATLAB/ Scilab.	06
4.	Read an image, plot its histogram then do histogram equalization and comment about the result.	06
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."	06
6.	Implement various Smoothing spatial filter	04
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.	06
8.	Write a program to implement various low pass filters and high pass filter in the frequency domain.	04
9.	Write a program for erosion and dilation, opening & closing using inbuilt and without inbuilt function.	04
10.	Implement and study the effect of Different Mask (Sobel, Prewitt, and Roberts)	04
11.	Implement various noise models and their Histogram	04
12.	Implement inverse filter and Wiener filter over image and comment on them	04
13.	Implement Image compression using DCT Transform	04
	TOTAL	60

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 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,

SECE3060	IMAGE PROCESSING WITH PYTHON
CO 1	Immediate understanding the concept of digital image.
CO 2	Prepare and evaluate different image enhancement techniques with filtering methdos.
CO 3	Apply image filtering to score image restoration , reconstruction and compression.
CO 4	Create image segementation and devise object recognition with the help of different case studies.

Mapping of CO with PO

SECE3060	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	2	2	1		1	1		3	3	3
CO 2	3	3	2	2	1		1	1		3	3	3
CO 3	3	3	2	2	1		1	1		3	3	3
CO 4	3	3	2	2	2		1	1		3	3	3

Mapping of CO with PSO

SECE3060	PSO1	PSO2	PSO3
CO 1		3	3

CO 2		3	
CO 3		3	
CO 4		3	

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction and Digital Image Fundamentals	1,2
2	Image enhancement in the Spatial domain	1,2
3	Filtering in the Frequency Domain:	2,4
4	Image Restoration and Reconstruction:	2,3,5
5	Color Image Processing:	2,5
6	Image Compression	2,4
7	Morphological Image Processing	2,4,5
8	Image Segmentation	4,5
9	Object Recognition and Case studies	3,6

P P Savani University
School of Engineering
Department of Computer Science & Engineering (ML & AI)

Course Code: SEML3910
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	
--	04	--	04	--	--	100	--	--	--	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 Summer Training:

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
	Total:	**100**

Course Outcome(s):
After completion of the course, the student will be able to,

SEML3910	SUMMER TRAINING
CO1	Construct company profile by compiling brief history, management structure, products/services offered, key achievements and market performance for the company visited during internship.
CO2	Determine the challenges and future potential for his/her internship organization in particular and the sector in general.
CO3	Test the theoretical learning in practical situations by accomplishing the tasks assigned during the internship period.
CO4	Apply various soft skills such as time management, positive attitude and communication skills during performance of the tasks assigned in internship

	organization.
CO5	Analyze the functioning of internship organization and recommend changes for improvement in processes.

Mapping of CO with PO

SEML3910	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1		1	2									
CO 2		1		2	1							
CO 3		1		1	1		1				1	
CO 4										2		
CO 5		3		1	3		1			2	2	

Mapping of CO with PSO

SEML3910	PSO1	PSO2	PSO3
CO 1	2		2
CO 2	1		2
CO 3	2	1	2
CO 4	1		2
CO 5	3	1	2

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. 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 Computer Science & Engineering (ML & AI)

Course Code: SEML3920
Course Name: 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	
--	04	--	04	--	--	100	--	--	--	100

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 Project:

Sr. No	• **Project 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
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.
2.	**Literature Review** Study of various technology or area to select a topic of the seminar.
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.
4.	**Implementation** Students must implement their proposal in any of the programming languages.
5.	**Report Writing** The report must be prepared as per suggested guidelines consisting of Preamble, Objectives,

	Scope, Introduction, Conclusions, Recommendations and Annexure.
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.

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 work 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 100 Marks.

Course Outcome(s):

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

SEML3920	PROJECT – II
CO1	Gain knowledge about various existing and future technologies.
CO2	Design and develop innovative system/application by applying the knowledge gained from various courses undergone in the earlier years.
CO3	Analyze user requirements and implement innovative ideas for social and environmental benefits.
CO4	Develop habit of working in a team.

Mapping of CO with PO

SEML3920	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1	1	2	1		1	1				2
CO 2	1	2	1	2	1						1	
CO 3		1	1			2	2			1	1	
CO 4									3			

Mapping of CO with PSO

SEML3920	PSO1	PSO2	PSO3
CO 1	3	1	2
CO 2	1	1	3
CO 3			
CO 4			

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE4022
Course Name: Cloud Computing & Applications
Prerequisite Course(s): - Computer Network (SECE3011), 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	--	04	40	60	20	30	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand the principles and paradigm of Cloud Computing.
- understand the Service Model with reference to Cloud Computing.
- appreciate the role of Virtualization Technologies.
- gain ability to design and deploy Cloud Infrastructure.
- understand cloud security issues and solutions.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Cloud Computing** Overview, Roots of Cloud Computing, Layers and Types of Cloud, Desired Features of a Cloud, Benefits and Disadvantages of Cloud Computing, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks	05	10
2.	**Cloud Architecture, Services and Applications** Exploring the Cloud Computing Stack, connecting to the Cloud, Infrastructure as a Service, Platform as a Service, Saas Vs. Paas, Using PaaS Application Frameworks, Software as a Service, Cloud Deployment Models, Public vs Private Cloud, Cloud Solutions, Cloud ecosystem, Service management, Identity as a Service, Compliance as a Service	07	10
3.	**Virtualization, Abstraction and Cloud Platform** Introduction to Virtualization Technologies, Load Balancing and Virtualization, Understanding Hypervisors, Understanding Machine Imaging, Porting Applications, Virtual Machines Provisioning and Manageability Virtual Machine Migration Services, Virtual Machine	05	15

	Provisioning and Migration in Action, Provisioning in the Cloud Hypervisors		
4.	**Cloud Infrastructure and Cloud Resource Management** Architectural Design of Compute and Storage Clouds, Layered Cloud Architecture Development, Design Challenges, Inter Cloud Resource Management, Resource Provisioning and Platform Deployment, Global Exchange of Cloud Resources. Administrating the Clouds, Cloud Management Products, Emerging Cloud Management Standards	06	15
Section II			
Module No.	Content	Hours	Weightage in %
5.	**Cloud Security** Security Overview, Cloud Security Challenges and Risks, Software-as-a-Service Security, Cloud computing security architecture: Architectural Considerations, General Issues Securing the Cloud, Securing Data, Data Security, Application Security, Virtual Machine Security, Identity and Presence, Identity Management and Access Control, Autonomic Security Establishing Trusted Cloud computing, Secure Execution Environments and Communications, , Identity Management and Access control Identity management, Access control, Autonomic Security Storage Area Networks, Disaster Recovery in Clouds	08	15
6.	**AWS Programming, Management Console and Storage** Basic Understanding APIs - AWS programming interfaces, Web services, AWS URL naming, Matching interfaces and services, Elastic block store - Simple storage service, Define the AWS Cloud and its value proposition, Identify aspects of AWS Cloud Economic, List the different cloud architecture design principles, Security and Compliance, Define the AWS Shared Responsibility Model, Define AWS Cloud Security and Compliance Concepts, Identify AWS Access Management Capabilities, Identify Resources for Security Support	07	20
7.	**AWS Technology, Billing and Pricing** Define Methods of Deploying and Operating in the AWS Cloud, Define the AWS Global Infrastructure, Identify the Core AWS Services, Identify Resources for Technology Support, Compare and Contrast the Various Pricing Models for AWS, Recognize the Various Account Structures in Relation to AWS Billing and Pricing, Identify Resources Available for Billing Support	07	15
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Write pros and cons of Cloud Computing.	04
2.	Summarize Cloud service models with real time examples.	04
3.	Define Virtualization. Also list and explain different Hypervisors.	04
4.	Discuss performance evaluation of service over cloud.	04

5.	Software study on Hadoop, MapReduce and HDFS.	04
6.	Create an AMI for Hadoop and implementing short Hadoop programs on the Amazon Web Services platform.	06
7.	Create a scenario that use Amazon S3 as storage on cloud.	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Cloud Computing Bible	Barrie Sosinsky	John Wiley & Sons

Reference Book(s):

Title	Author/s	Publication
Amazon Web Services for Dummies	Bernard Golden	Dummies
Amazon Web Services in Action	Michael Wittig and Andreas Wittig	Dreamtech Press
Building Applications in the Cloud: Concepts, Patterns and Projects	Christopher M. Moyer	Pearson Addison-Wesley Professional
Cloud Computing Design Patterns	Thomas Erl	Prentice Hall

Web Material Link(s):

- CloudSim 3.0.3
- http://www.cloudbus.org/
- https://aws.amazon.com/
- http://aws.amazon.com/documentation/
- http://docs.aws.amazon.com/IAM/latest/UserGuide/getting-started.html

Course Evaluation:

Theory:

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

Practical:

- Continuous Evaluation Consist 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 of 15 Marks during End Semester Exam.
- Viva/Oral performance of 15 Marks during End Semester Exam.

Course Outcome(s):

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

SECE4022	CLOUD COMPUTING & APPLICATIONS
CO 1	Interpret and utilize data mining techniques to discover pattern from the large datasets.
CO 2	Categorize and identify list of data mining methodologies to diagnose software for

	effective software development process.
CO 3	Reframe redundancy and incomplete data from the dataset using data pre processing methods.
CO 4	Express strategic decisions using data warehousing architectures and tools.

Mapping of CO with PO

SECE4022	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	2	2	2		2		3	3	3	3
CO 2	2	2	2	2	2		2		1	1	2	1
CO 3	2	2	2	3	2	3	2			1	2	1
CO 4	2	1	2	2	3	3	1		3	2	2	2

Mapping of CO with PSO

SECE4022	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction to Cloud Computing	1, 2
2	Cloud Architecture, Services and Applications	1, 2
3	Virtualization, Abstraction and Cloud Platform	1, 2, 3
4	Cloud Infrastructure and Cloud Resource Management	1, 2, 3
5	Cloud Security	1, 2, 3
6	AWS Programming, Management Console and Storage	1, 2, 3, 4
7	AWS Technology, Billing and Pricing	3, 4, 5, 6

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3051
Course Name: System Programming
Prerequisite Course(s): SECE2071 (Data Structures & Algorithm)

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 design concepts of various system software like Assembler, Linker, Loader and Macro pre-processor, Utility Programs such as Text Editor and Debugger
- understand the execution process of High-level language programs.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Introduction, Software, Software Hierarchy, Systems Programming, Machine Structure, Interfaces, Address Space, Computer Languages, Tools, Life Cycle of a Source Program, Different Views on the Meaning of a Program, System Software Development, Recent Trends in Software Development, Levels of System Software	03	10
2.	**Overview of Language Processors** Programming Languages and Language Processors, Language Processing Activities, Program Execution, Fundamental of Language Processing, Symbol Tables; Data Structures for Language Processing: Search Data structures, Allocation Data Structures	06	15
3.	**Assemblers** Elements of Assembly Language Programming, Design of the Assembler, Assembler Design Criteria, Types of Assemblers, Two-Pass Assemblers, One-Pass Assemblers, Single pass Assembler for Intel x86, Algorithm of Single Pass Assembler, Multi-Pass Assemblers, Advanced Assembly Process, Variants of Assemblers Design of two pass assembler	06	15
4.	**Macro and Macro Processors** Introduction, Macro Definition and Call, Macro Expansion, Nested Macro Calls, Advanced Macro Facilities, Design of a Macro Pre-processor, Design of a Macro Assembler, Functions of a Macro	08	10

	Processor, Basic Tasks of a Macro Processor, Design Issues of Macro Processors, Features, Macro Processor Design Options, Two-Pass Macro Processors, One-Pass Macro Processors		
Section II			
Module No.	Content	Hours	Weightage in %
5.	**Linkers and Loaders** Introduction, Relocation of Linking Concept, Design of a Linker, Self-Relocating Programs, Linking in MSDOS, Linking of Overlay Structured Programs, Dynamic Linking, Loaders, Different Loading Schemes, Sequential and Direct Loaders, Compile-and-Go Loaders, General Loader Schemes, Absolute Loaders, Relocating Loaders, Practical Relocating Loaders, Linking Loaders, Relocating Linking Loaders, Linkers v/s Loaders	06	20
6.	**Scanning and Parsing** Programming Language Grammars, Classification of Grammar, Ambiguity in Grammatical Specification, Scanning, Parsing, Top Down Parsing, Bottom up Parsing, Language Processor Development Tools, LEX, YACC	06	10
7.	**Compilers** Causes of Large Semantic Gap, Binding and Binding Times, Data Structure used in Compiling, Scope Rules, Memory Allocation, Compilation of Expression, Compilation of Control Structure, Code Optimization	06	10
8.	**Interpreters & Debuggers** Benefits of Interpretation, Overview of Interpretation, the Java Language Environment, Java Virtual Machine, Types of Errors, Debugging Procedures, Classification of Debuggers, Dynamic/Interactive Debugger	04	10
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Write a program to read data from file and count the frequency of each word.	02
2.	Implement a symbol table routine to determine whether an identifier lexeme has previously seen & store a new lexeme into symbol table	04
3.	Implement One pass assembler.	02
4.	Implement Two pass assembler.	04
5.	Write a program to implement Macro processor.	02
6.	Implement a lexical analyzer that reads the input one character at a time and returns to the parser the token it has found.	04
7.	Write a program to left factor the given grammar	04
8.	Write a program to remove the Left Recursion from a given grammar.	04
9.	Implement recursive descent or predictive parser.	02
10.	Implement operator precedence or LR parser.	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Compilers-Principles, Techniques and Tools	Aho. A.V., Sethi. R. & Ullman. J. D.	Pearson, 2006

Reference Book(s):

Title	Author/s	Publication
System Software -An Introduction to System Programming	Leland L. B.	3rd Ed, Addision Wesley, reprint, 2003
Compiler Construction-Principles and Practice	Louden, K. C	1st Ed, Thomson, 1997
System Programming and Operating System	Dhamdhere. D. M.,	2nd Ed,TMH,1999
Compiler Design in C,	Houlb A. I.,	PHI, EEE, 1995

Web Material Link(s):

- https://nptel.ac.in/courses/106/108/106108052/
- https://www.youtube.com/watch?v=Qkwj65l_96I

Course Evaluation:

Theory:

- Continuous Evaluation Consist of two Tests of 30 Marks and 1 Hour of duration and finally the total will be converted to 30.
- Faculty Evaluation consists of 10 marks as per guidelines provided by Course Coordinator.
- End Semester Examination will consist of 60 marks.

Practical:

- Continuous Evaluation Consist of Performance of Practical which should be evaluated out of 10 for each practical in the next turn and average of the same will be converted to 10 Marks.
- Internal Viva component of 10 Marks.
- Practical performance/quiz/test of 20 Marks during End Semester Exam.
- Viva/Oral performance of 10 Marks during End Semester Exam.

Course Outcome(s):

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

SECE3051	SYSTEM PROGRAMMING
CO 1	Explain and classify different methodologies, concepts and approaches to system software programming.
CO 2	Identify elements of language processors with various data structures used in development of one pass and multi pass assemblers.
CO 3	Explain macro processor, its usage and compare various loading and linking schemes.
CO 4	Develop various system programs using language processor development tools such as yacc and lex.
CO 5	Design code optimization based solution for the given system problems by applying various techniques of compiler, interpreter and debugger.

Mapping of CO with PO

SECE3051	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1		2	1	2	2	2	3			3		3

CO 2	1	2	1	3	3	3	3			3		3
CO 3	1	2	1	3	3	3	3			3		3
CO 4	1	2	1	3	3	3	3			3		3
CO 5	1	2	2	3	3	2	3			3		3

Mapping of CO with PSO

SECE3051	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3
CO 5	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	1
2	Overview of Language Processor	1,2
3	Assemblers	2,4
4	Macro and Macro Processors	2,4
5	Linkers and Loaders	2,4
6	Scanning and Parsing	2,4,6
7	Compilers	2,4
8	Interpreters & Debuggers	2,4,5

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3070
Course Name: 3D Modelling and Rendering
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	--	03	40	60	20	30	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to,

- To understand the fundamentals of modeling and rendering.
- To know the working principles of objects in three dimensional space.
- To acquire knowledge about the issues in Scene modelling.
- To learn rendering algorithms and application of special effects to the modelled objects.
- To gain skill in designing real time movie and games.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**MATHEMATICS FOR MODELING** Survey of Computer Graphics – Overview of Graphics System: Video Display Devices, Raster System, Input Devices – Interactive Input Methods and Graphical User Interfaces – Vector Tools for Graphics: Dot Product, Cross Product, Representation of Key Geometric Objects, Intersection of lines and planes, Polygon Intersection – Introduction to OpenGL.	06	15
2.	**GEOMETRIC PRIMITIVES MODELING** Transformation of Objects: 3D Affine Transformation, Geometric Transformation – 2D and 3D Viewing – Modeling Shapes with Polygons Meshes – Curves and Surface Design – Color Models and Color Application – Object Modeling using OpenGL – Introduction to Unity Software.	06	20

3.	**OBJECT MODELING** Rendering Faces for Visual Realism – Hidden surface removal – Visual Surface Detection Methods – Illumination Models and Surface Rendering Methods – Computer Animation – Hierarchical Modeling – Human Character Modeling – Applying Emotion for the Characters – Vehicle Modeling – Landscape Modeling.	03	15
	Section II		
4.	**SCRIPTING** Physics: Collision Detection, Particles Systems, Rigid Bodies Motion, Deformable Bodies – Artificial Intelligent: Path Finding, Controlled Based Animation, Animation and Modeling: Keyframe, Kinematics, Inverse Kinematics – Rigging – Bones – Adding Speech Movements to Characters – Skinning – Spatial Sorting – Level of Details.	08	20
5.	**RENDERING AND SPECIAL EFFECTS** Developing 2D and 3D Interactive Scene using OpenGL, Unity and Similar Tools – Overview of Gaming Genre, Atmospheric and Render Effects – Ray Tracing and Mental Ray – Advanced Tools in Rendering – Global Illumination – Shade Effects – Sound – Lighting – Video Post Interface – Atmospheric Effects: Fire, Water, Fog – Impact of Graphics and Animation on Film and Gaming Industry.	07	30
	TOTAL	30	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Implement an OpenGL program that determines the point of intersection between two lines and line with a plane.	03
2.	Using vertex and color arrays, set up the description for a scene containing at least six two dimensional objects in OpenGL.	03
3.	Implement a OpenGL program that removes the hidden surface of the objects in a scene of five objects that overlaps.	03
4.	Music and audio editing using Audacity.	03
5.	Creation of interactive presentation and portfolio using 2D animation (tweening, masking, audio effect) using Flash.	03
6.	Video editing using iMovie/FinalCutPro/Adobe Premiere.	03
7.	Creating, modifying, gravity and applying movements to particles.	03
8.	Creating human, birds, animal characters in Unity/Maya.	03
9.	Working with lights, applying different light for the scene.	03
10.	Develop a simple Game using Unity/Maya as mini project.	03
	TOTAL	30

Reference Book(s):

Title	Author/s	Publication

Computer Graphics Using OpenGL	F. S. Hill Jr., Stephen Kelly	Third Edition, Persons Education/PHI Learning, 2007.
Computer Graphics with OpenGL",	Donald Hearn, M. Pauline Baker	Third Edition, Pearson Education, 2012.
"3D Animation Essentials",	Andy Beane	John Wiley & Sons, 2012.
"Practical Algorithms for 3D Computer Graphics",	R. Stuart Ferguson,	Second Edition, CRC Press, 2013.
Auto Desk Maya 2016 Basic Guide",	Kelly L. Murdock	Auto Desk Maya, 2016.

Course Evaluation:

Theory

- Continuous evaluation consists of two tests each 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 will consist 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/drawing/test of 15 marks during End Semester Exam.
- Viva/Oral performance of 15 marks during End Semester Exam.

Course Outcome(s):

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

SECE3070	**3D MODELLING AND RENDERING**
CO1	Explain the fundamentals of modeling and rendering.
CO2	Illustrate the working principles of objects in three dimensional space.
CO3	Discuss the working principles of objects in three dimensional space.
CO4	Recite the rendering algorithms and application of special effects to the modelled objects.
CO5	Discover the skills in designing real time movie and games.

Mapping of CO with PO

SECE3070	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	1		1	1							
CO 2	1	1		1	3			1				
CO 3	1			1	2							
CO 4	1	1		1	3			1				
CO 5	1	1		1	3			1				

Mapping of CO with PSO

SECE3070	PSO1	PSO2	PSO3
CO 1	2	2	2

CO 2	1	1	3
CO 3	2	2	2
CO 4	2	1	2
CO 5	1		1

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Mathematics for Modelling	1, 2, 4
2	Geometric primitives Modelling	2, 3, 5, 6
3	Object Modelling	1, 4, 5, 6
4	Scripting	1, 3, 5, 6
5	Rendering and Special Effects	3, 4, 5, 6

P P Savani University
School of Engineering
Department of Computer Science & Engineering (ML & AI)

Course Code: SEML3930
Course Name: Project-III
Prerequisite Course (s): --

Teaching & Examination Scheme:

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

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 Project:

Sr. No	Project 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
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.
2.	**Literature Review** Study of various technology or area to select a topic of the seminar.
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.

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

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 work 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 100 Marks.

Course Outcome(s):

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

SEML3930	PROJECT-III
CO1	Support the theoretical learning with practice and integrate knowledge for engineering applications.
CO2	Solve challenging projects for commercial, societal and environment benefit.
CO3	Understand the importance of planning, documentation, punctuality and work ethics.
CO4	Develop habit of working in a team.

Mapping of CO with PO

SEML3930	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	3	3	3	3	3	3	3	3	3	3
CO 2	3	3	3	3	3	3	3	3		3	3	3
CO 3	3	3	3	3	3	3	3	3	3	3	3	3
CO 4	3	3	3	3	3			3	3	3	3	3

Mapping of CO with PSO

SEML3930	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3

CO 3	3	3	3
CO 4	3		3

P P Savani University
School of Engineering
Department of Computer Science & Engineering (ML & AI)

Course Code: SEML3490
Course Name: Online NPTEL Course
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			03	100	--	--	--	--	--	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Learn new subjects as per recent trends in the industry from national experts.

Course Content:
Performance analysis will be based on any one of the following subjects:

1. Deep Learning
2. Computer Graphics
3. Computer Vision
4. Design Engineering
5. Neural Networks
6. Natural Language Processing
7. Blockchain Technology
8. Virtual Reality
9. Real time systems
10. Big Data
11. Advanced graph theory
12. Theory of computation
13. Cryptology

Or any other NPTEL course; available time to time.

Course Evaluation:
Practical:

- Continuous Evaluation as per the guidelines of NPTEL assignments and tests.
- The NPTEL score will be directly fetched and converted out of 100.

Course Outcome(s):
After the completion of the course, the following course outcomes will be able to:

SEML3490	**ONLINE NPTEL COURSE**
CO 1	Inculcate mode of self-learning.
CO 2	Exposure to relevant and newest tools and technologies.

CO 3	Value addition when the student is applying for jobs.
CO 4	Use NPTEL program for GATE and high studies preparation.
CO 5	Facilitate students to attain certificate and to make them employable in the industry or pursue higher education program.

Mapping of CO with PO

SEML3490	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1		1		2	1	1		1			1
CO 2	1		2	2	2				1	1		2
CO 3		2	2	2	2			1		2		
CO 4	2	1		1	1	1				1		2
CO 5						1		1		2		3

Mapping of CO with PSO

SEML3490	PSO1	PSO2	PSO3
CO 1	2	2	2
CO 2	3	3	3
CO 3	1	1	3
CO 4	2	2	3
CO 5	2	2	3

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3550
Course Name: Optimization Techniques
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	--	03	40	60	20	30	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to,

- Cast engineering minima/maxima problems into optimization framework.
- Learn efficient computational procedures to solve optimization problems.
- Use Matlab to implement important optimization methods.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Mathematical preliminaries** Linear algebra and matrices Vector space, eigen analysis Elements of probability theory Elementary multivariable calculus	08	25
2.	**Linear Programming** Introduction to linear programming model Simplex method Duality Karmarkar's method	07	25
Section II			
3.	**Unconstrained optimization** One-dimensional search methods Gradient-based methods Conjugate direction and quasi-Newton methods	04	15
4.	**Constrained Optimization** Lagrange theorem FONC, SONC, and SOSC conditions	04	15
5.	**Non-linear problems** Non-linear constrained optimization models KKT conditions	07	20

	Projection methods		
	TOTAL	30	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Matrix operations in Matlab	02
2.	Differentiation of a vector and matrix in Matlab	02
3.	Integration of a vector and matrix in Matlab	02
4.	Simplex algorithm in Matlab	04
5.	Implementation of Newton's method in Matlab	04
6.	Implementation of Secant method in Matlab	04
7.	Implementation of Lagrange multiplier method in Matlab	04
8.	Implementation of KKT theorem in Matlab	04
9.	Implementation of BFGS method in Matlab	04
	TOTAL	30

Reference Book(s):

Title	Author/s	Publication
An introduction to Optimization	Edwin P K Chong, Stainslaw Zak	Wiley Publication
Nonlinear Programming	Dimitri Bertsekas	Athena Scientific

Course Evaluation:

Theory:

- Internal Evaluation component consists of 30 marks containing two internal exams of 30 marks. Average of the same will be considered for final marking.
- End Semester Examination consists of 60 marks.
- Faculty evaluation component will be cumulative of assignments, exercises, classroom behaviors consisting of 10 marks.

Practical

- ContinuousEvaluation will be cumulative of practical performances, activities, presentations, viva and submissions consisting of 20 marks.
- Practical performance/quiz/drawing/test/submission of 30 marks during End Semester Exam.

Course Outcome(s):

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

SECE3550	OPTIMIZATION TECHNIQUES
CO 1	Recall the theoretical foundations of various issues related to linear programming modeling to formulate real world problems as a l p model.
CO 2	Identify appropriate optimization methods to solve complex problems involved in various industries.
CO 3	Explain the theoretical workings of the graphical, simplex and analytical methods for making effective decisions on variables so as to optimize the objective function.

CO 4	Find the appropriate algorithm for allocation of resources to optimize the process of assignment.

Mapping of CO with PO

SECE3550	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	3	3	3	3	3		3	3		3
CO 2	3	3	3	3	3	3			3			3
CO 3	3	3	3	3	3	3	3	3	3	3	3	3
CO 4		3	3	3	3		3					

Mapping of CO with PSO

SECE3550	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Mathematical preliminaries	2,3,4
2	Linear Programming	3,4,5
3	Unconstrained optimization	2,3,4
4	Constrained optimization	3,4,5
5	Non-Linear Problems	2,3,4

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3560
Course Name: Business Analytics
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	--	03	40	60	20	30	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- find a meaningful pattern in data.
- learn to analyze the data using intelligent techniques.
- make better business decisions by using advanced techniques in data analytics.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction, Data Definitions and Analysis Techniques** Introduction to Data Analytics, Types of Data Analytics, Process of Data Analytics, Importance and Challenges of Big Data Analytics, Elements, Variables, Data Categorization, Levels of Measurement, Data Management and Indexing, Introduction to Business Analytics.	07	25
2.	**Basic Analysis Techniques** Introduction to Statistical learning, Descriptive Statistics, Inferential Statistics through Hypothesis Tests, Maximum Likelihood Test, correlation Analysis	08	25
Section II			
Module No.	Content	Hours	Weightage in %
3.	**Data Analysis Techniques** Introduction to ML, Regression Analysis and its types, K Nearest Neighbors Regression & Classification Techniques, Clustering, Association Rules Analysis	10	25
4.	**Visualization** Introduction, Types of data visualization, Data for visualization: Data types, Data encodings, Retinal variables,Mapping variables to encodings, Visual encodings.	05	25
	TOTAL	30	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Importing and exporting data in python	02
2.	Python packages for data analytics	02
3.	Preprocessing of data (Data formatting, data normalization, missing values etc.) in python	04
4.	Mathematical computing using NumPy	02
5.	Data manipulation with pandas	02
6.	Data visualization with python (matplotlib, seaborn etc.)	02
7.	Model building using Scikit-Learn library	02
8.	Linear Regression	02
9.	Data Visualization Using Tableau	04
10.	Case Study on Business Analytics	04
11.	Case Study on Business Analytics	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Data Mining and Business Analytics with R	Johannes Ledolter	Wiley

Reference Book(s):

Title	Author/s	Publication
Intelligent Data Analysis	Michael Berthold, David J. Hand	Springer, 2007
Mining of Massive Datasets	Anand Rajaraman, Jeffrey David Ullman	Cambridge University Press

Web Material Link(s):

- https://www.coursera.org/learn/data-analytics-business
- https://nptel.ac.in/courses/110106072/

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/drawing/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,

CO 1	Immediate understanding of data with various analysis techniques and business analytics.
CO 2	Compute basis analysis techniques.
CO 3	Explain machine learning and analysis techniques for data.
CO 4	Visualize the outcome of analysis.

Mapping of CO with PO

SECE3560	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	2		3	2		2		3			3
CO 2	2	3		3	2		3		3			3
CO 3	2	3		3	3		3		2			3
CO 4	1	3		3	3		3		2			3

Mapping of CO with PSO

SECE3560	PSO1	PSO2	PSO3
CO 1	3	2	
CO 2	3	2	3
CO 3	3	3	3
CO 4	1		3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction, Data Definitions and Analysis Techniques	1,2
2	Basic Analysis Techniques	2,4,5
3	Data Analysis Techniques	2,4,5
4	Visualization	3,4,5

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	--	03	40	60	20	30	--	--	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 %
4.	**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 Exchange, WS-Security (including XML-Encryption, XML-Signature, and SAML).	07	20

5.	**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
	TOTAL	30	100

List of Practical(s):

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
	TOTAL	30

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,

SECE3520	**SERVICE ORIENTED COMPUTING**
CO 1	Explain the difference between monolithic architecture versus service oriented architecture (soa).
CO 2	Practice real life examples and identify the underlying principles of soa.
CO 3	Implement and integrate service oriented architecture in the development cycle of web service based applications.
CO 4	Understand advanced concepts such as service composition, orchestration and choreography.

Mapping of CO with PO

SECE3520	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1		2	1				2	1		1		3
CO 2	2	2	1					1			1	1
CO 3	2	2	2				2	1			3	1
CO 4	2	2	2				1			1	1	1

Mapping of CO with PSO

SECE3520	PSO1	PSO2	PSO3
CO 1			3
CO 2	3	2	1
CO 3	3	3	2
CO 4		2	3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	1,2
2	Enterprise architectures	1,2,3
3	Basic Concepts	1,2,3
4	Principles of Service-Oriented Architecture	1,2,4
5	Principles of Service-Oriented Computing	1,2,3,4

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3570
Course Name: NO SQL with MongoDB
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	--	03	40	60	20	30	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

- become a master of one the most famous and feature rich NoSQL database.
- gain knowledge and skills to become a successful mongoDB expert.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to NoSQL Database:** Installation and Configuration, Basics of MongoDB, Benefits of Using NoSQL, Different types of NOSQL databases, Difference between RDBMS and NOSQL, Difference between RDBMS and NOSQL	05	16
2.	**MongoDB CRUD Operations**- Create, Read, Update, Delete, MongoDB Datatypes, Create Collections, Drop Collections	05	16
3.	**Schema Design and Data Modelling** Insert Documents, Query Operations, Projections Queries, Limiting Query Result, Update Documents, Delete Documents	05	18
Section II			
4.	**Indexing and Aggregation Framework** Concept of Aggregation, Sorting, Indexing, Advanced Indexing	05	18
5.	**Scalability and Availability** Concept of Replication, Concept of Sharding, Sharded Cluster	05	16

6.	**Administration** Export, Data backup and Restore, Regular Expressions	05	16
	TOTAL	30	100

List of Practical(s):

Sr. No	Name of Practical	Hours
1.	Download, Install and Run MongoDB.	02
2.	Establishing Connection with MongoDB.	02
3.	Create and Drop Database in MongoDB.	02
4.	Create and Drop Collection in MongoDB.	02
5.	Insert Document in MongoDB.	02
6.	Datatypes in MongoDB Database.	02
7.	Read document from Collection.	02
8.	AND & OR Operation in MongoDB.	02
9.	Delete document from Collection.	02
10.	Projection in MongoDB.	02
11.	Limit & Skip function in MongoDB.	02
12.	Sorting in MongoDB.	02
13.	Update document data in MongoDB.	02
14.	Create index in MongoDB	02
15.	Backup & Restore MongoDB.	02
	TOTAL	30

Reference Book(s):

Title	Author/s	Publication
NoSQL with MongoDB	Brad Dayley	2014, SAMS
MongoDB: The Definitive Guide	Kristina Chodorow, Michael Dirolf	O'Reilly Media, Inc.
Professional NoSQL	Shashank Tiwari	John Wiley & Sons Inc

Course Evaluation:

Theory:

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

Practical

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

Course Outcome(s):

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

SECE3570	NO SQL WITH MONGODB
CO 1	Identify the different types of databases.
CO 2	Distinguish the rdbms with different nosql databases.
CO 3	Manipulate the data using crud operations.
CO 4	Examine the concept of indexing and aggregation in the real world application development.

Mapping of CO with PO

SECE3570	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1		3	3	3	3	3		3		3		3
CO 2	3	3	3	3	3	3	3	3		3		3
CO 3		3	2	3	3	3		3		3	2	3
CO 4	3	3	3	3	3	3	3	3		3	2	3

Mapping of CO with PSO

SECE3570	PSO1	PSO2	PSO3
CO 1		3	3
CO 2	3	3	
CO 3	3	3	3
CO 4	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction to NoSQL Database	1,2
2	MongoDB CRUD Operations	2,3
3	Schema Design and Data Modelling	3
4	Indexing and Aggregation Framework	3,4
5	Scalability and Availability	3,4
6	Administration	4,5

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3580
Course Name: R Programming
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	--	03	40	60	20	30	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to,

- understand the basics in R programming in terms of constructs, control statements, string functions etc.
- design and write efficient programs using R, to perform routine and specialized data manipulation/management and analysis tasks.
- identify and use available R packages and associated Open Source software to meet given scientific objectives.
- handle all aspects of Data analysis (exploring, summarizing, statistical analyzing, visualizing).

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** History and Overview of R, Features of R, Install R,R Environment,R Objects, R Variables,R Operators, Work with Base and Contributed R Packages	03	14
2.	**R Datatypes** Atomic Datatypes, Creating Vectors, Vectorized Operations, Working with List and its Operations, Create Matrices and Array, Create Factors, Working with Data Frame ,Merging Data Frames, Data Frame Operations, Data Reshaping Functions : cbind(), rbind(), cast(), melt(), Handling Date in R,NA and NULL ValuesConversion of Datatypes,R Decision making and R LoopsLoop Functions	06	19
3.	**R Functions** Basic Inbuilt Functions,Operations on Date and Time,String Operations,Work with Packages to handle Date and String, Creating user defined Function, Calling Function, Arguments matching, Lazy Evaluation	06	17
Section II			

4.	**Managing Data** Reading Data Files with read.table(), Work with readr Package, Removing NA Values,Reading data into R : CSV, Excel, JSON, Saving data in R, Managing Data with dplyr Package	05	18
5.	**Data Visualization** Grammar of Graphics, Work with : Bar Chart, Pie Chart, Histogram, Box plot, Scatter plot, Line Chart , Multiple Charts on Single Layout, Save Graphs in Files, Data Visualization with ggplot2	05	16
6.	**Statistics and Debugging** Basic Statistics, Linear Models and Non-Linear Models, Time Series and Autocorrelation, Clustering, Debugging tools in R	05	16
	TOTAL	30	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Install R and R studio. Understand R Environment.	02
2.	Install base packages. Import Distributed Packages in R workspace.	02
3.	Write R code to demonstrate Variables, Objects, Comments, print(),cat(), class(),readline().	02
4.	Write R code to demonstrate Vector and List with required operations.	02
5.	Write R code to demonstrate Matrices and Array.	02
6.	Write R code to demonstrate Decision making statement and Loops.	02
7.	Write R code to demonstrate Factor and Data Frame with its basic operations.	02
8.	Write R code to demonstrate Data reshaping functions.	02
9.	Write R code to demonstrate basic inbuilt functions in R.	02
10.	Write R code to demonstrate Date and Time. Also install other suitable packages to handle Date and Time.	02
11.	Write R code to demonstrate String Manipulation. Install other suitable packages to handle String.	02
12.	Write code to demonstrate User-defined Functions in R.	02
13.	Write R code to manage data from various types of Files with suitable example.	02
14.	Write R code to demonstrate data manipulation with dplyr package.	02
15.	Write R code to plot different charts with suitable example. Also use ggplot2 pckage.	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
The Art of R Programming: A Tour of Statistical Software Design	Norman Matloff	No starch Press
R for Everyone: Advanced Analytics and Graphics	Jared P. Lander	Addison-Wesley

Reference Book(s):

Title	Author/s	Publication

Beginning R – The Statistical Programming Language	Mark Gardener	Wiley
R Programming for Data Science	Roger D. Peng	Leanpub

Course Evaluation:

Theory

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

Practical

- Continuous Evaluation will be cumulative of practical performances, activities, presentations, viva and submissions consisting of 40 marks.
- Practical performance/quiz/test consists of 30 marks during End Semester Exam.
- Viva/Oral performance of 30 marks during End Semester Exam.

Course Outcome(s):

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

SECE3580	**R PROGRAMMING**
CO 1	Perform simple arithmetic and statistical operations in r and read data files into r.
CO 2	Apply family of functions for subsetting and basic computations and solve real world problems.
CO 3	Get familiar with r data structures, especially vectors and data frames and perform data manipulation on data frames.
C0 4	Recall the basic principles of r programming students can able to handle all aspects of data analysis.
CO 5	Give design and write efficient programs using r, to perform various manipulation of data.

Mapping of CO with PO

SECE3580	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	2	3		3	3		3		2	2
CO 2	3	3		2	3	3	3		3	3	3	3
CO 3	3	2			3	3	3		3	3	3	3
CO 4	3	3	3	3	3	2	3		3	3	3	3
CO 5	3	1	2	2	3	3	2		3	3	3	3

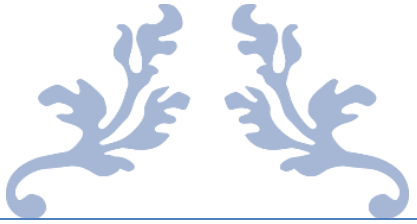
Mapping of CO with PSO

SECE3580	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3
CO 5	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	1
2	R Datatypes	2,3
3	R Functions	2,3,4
4	Managing Data	2,3
5	Data Visualization	2,3,4,5
6	Statistics and Debugging	3,4,5,6



FOURTH YEAR B.TECH.

P P SAVANI UNIVERSITY																
SCHOOL OF ENGINEERING																
TEACHING & EXAMINATION SCHEME FOR FOURTH YEAR B.TECH. COMPUTER SCIENCE ENGINEERING (MLAI) PROGRAMME AY: 2021-22																
Sem	**Course Code**	**Course Title**	**Offered By**	**Teaching Scheme**					**Examination Scheme**							
				Contact Hours				**Credit**	**Theory**		**Practical**		**Tutorial**		**Total**
				Theory	**Practical**	**Tutorial**	**Total**		**CE**	**ESE**	**CE**	**ESE**	**CE**	**ESE**	
7	SECE4060	Artificial Intelligence of Things	CE	2	4	0	6	4	40	60	40	60	0	0	200
	SECE4070	Computer Vision	CE	2	4	0	6	4	40	60	40	60	0	0	200
	SECE4080	Natural Language Processing	CE	3	4	0	7	5	40	60	40	60	0	0	200
	SEPD4010	Creativity, Problem Solving & Innovation	SEPD	3	0	0	3	3	100	0	0	0	0	0	100
	SEML4910	Project/Summer Internship	CSE	5			0	5	0	0	100	0	0	0	100
	SEML4920	Project - IV	CSE	4			4	4	0	0	100	0	0	0	100
		Elective - II		2	2	0	4	3	40	60	20	30	0	0	150
				Total			**30**	**28**							**1050**
8	SEML4940	Project/Training	CSE	19			19	19	0	0	200	300	0	0	500
				Total			**19**	**19**							**500**

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	
7	SECE4530	Research Methodology	CE	2	0	1	3	3	40	60	0	0	50	0	150
	SEIT4521	Blockchain Technology	IT	2	2	0	4	3	40	60	20	30	0	0	150
	SEIT4530	Cyber Security	IT	2	2	0	4	3	40	60	20	30	0	0	150
	SECE4540	Design Engineering	CE	2	0	1	3	3	40	60	0	0	50	0	150
	SECE4550	Advanced Web Technology	CE	2	2	0	4	3	40	60	20	30	0	0	150

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE4060
Course Name: Artificial Intelligence of Things
Prerequisite Course (s): SECE2090 – Introduction to Data Science

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	--	04	40	60	40	60	--	--	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to,

- introduce the fundamental concepts relevant to design issues related to Internet of Things.
- learn how to interface sensors and Actuators with embedded IoT devices.
- implement connectivity and communication IoT protocols.
- implement IoT applications with concepts of AI.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction of AI and IoT** What is an AI? AI Problems and applications, Major areas of AI, History of AI. What is IoT? Impact of IoT, IoT Challenges, IoT model/architecture.	02	10
2.	**Hardware in IoT** Choosing criteria for IoT Hardware, Arduino UNO, NodeMCU, ESP32, Sensing, Actuation, Arduino C, GPIO programming & interfacing IoT hardware.	04	15
3.	**Networking in IoT** SOA for IoT, IoT Gateways, IoT Protocol stack, Networking Protocols - MQTT: MQTT Communication, SMQTT CoAP, XMPP, AMQP	05	13
4.	**Communication in IoT** Connectivity protocols - IEEE 802.15.4, Zigbee, 6LowPAN, Wireless HART, Z-Wave, ISA 100, Bluetooth, NFC, RFID, RPL, WiFi, BLE/iBeacon, LORAwan, cellular and Ethernet	04	12
Section II			

5.	**Raspberry Pi** Raspberry Pi and its variant, Raspberry Pi programming, Choosing a right board, Tools, Sensing IoT Environments	03	12
6.	**Machine Learning for IoT** Prediction using linear regression, Logistic regression for classification, classification using support vector machine, Naïve byes, decision tree	05	15
7.	**IoT and AI Platforms** Google Cloud IoT, Microsoft Azure IoT Suite, Amazon AWS IoT, IBM Watson IoT Platform, Predix, H2O	04	13
8.	**Application of AI in IoT – Case Studies** Smart City, Smart Grid, Smart Transportation, Smart Manufacturing, Smart Healthcare, Agriculture, Activity Monitoring and Smart Homes.	03	10
	TOTAL	30	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Getting started with Arduino IDE, add ESP8266 and ESP32 in the Arduino IDE. GPIO Interfacing and programming	04
2.	Digital on/off sensor (PIR and IR) Interfacing programming	04
3.	Analog sensors Interfacing (Accelerometer and gyroscope) & Programming	04
4.	Interfacing and programming of actuators	04
5.	Walk through existing library for ESP8266. Configure ESP8266 in station and access mode	04
6.	Development of an local offline server using http protocol	04
7.	Development of an online server	04
8.	Experimenting with Blynk & Arduino IoT cloud	06
9.	Exchange information using MQTT protocol	04
10.	Getting started with Raspberry Pi and OS Installation	04
11.	Sensing IoT devices with Raspberry Pi using Python	04
12.	Experimenting with Amazon AWS IoT cloud	04
13.	AIoT based mini project	10
	TOTAL	60

Reference Book(s):

Title	Author/s	Publication
Artificial Intelligence	By Elaine Rich And Kevin Knight	(2nd Edition) Tata McGraw-Hill
Internet of Things (A Hands-on Approach)	Vijay Madisetti and Arshdeep Bahga	1st Edition, VPT
Hands-On Artificial Intelligence for IoT	By Amita Kapoor	Packt Publishing, 2019

Sensors, Actuators and Their Interfaces	N. Ida	Scitech Publishers
IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things	David Hanes, Gonzalo Salgueiro, Patrick Grossetete	1st Edition, 2018, Pearson India
21 Internet of Things (IOT) Experiments: Learn IoT, the programmer's way	Yashavant Kanetkar and Shrirang Korde	1st Edition, 2018, BPB Publications

Web links:

- https://nptel.ac.in/courses/106106126/
- https://nptel.ac.in/courses/106/105/106105166/
- 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, which 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 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,

SECE4060	**ARTIFICIAL INTELLIGENCE OF THINGS**
CO 1	Understanding Concepts of Artificial Intelligence and Internet of Things.
CO 2	Analyzing the Concepts of Hardware, Networking and Communication in IOT.
CO 3	Elaborating minicomputer in IOT named as Raspberry PI.
CO 4	Introducing and Solving Machine Learning algorithms in addition with IOT on different Platforms.
CO 5	Explaining different Applications of AI in IOT.

Mapping of CO with PO

SECE4060	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1		1		2			1	2	1	1	2
CO 2		2	1		1				2	2	2	3
CO 3	1	2		1	3			1	1	1		2
CO 4		3	3	2	3				2	2	1	2

CO 5	2	1	2	2	2				1	1		2

Mapping of CO with PSO

SECE4060	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	2	2	2
CO 3	2	2	2
CO 4	3	3	3
CO 5	3	3	2

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction of AI and IoT	1
2	Hardware in IoT	2,3
3	Networking in IoT	2
4	Communication in IoT	2
5	Raspberry Pi	3
6	Machine Learning for IoT	3
7	IoT and AI Platforms	2,3
8	Application of AI in IoT – Case Studies	4

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE4070
Course Name: Computer Vision
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	--	04	40	60	40	60	--	--	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s)of the Course:

To help learners to,

- detect, segmentation and recognition of certain objects in images.
- understand motion computation and 3D vision and geometry.
- get programming experience for implementing computer vision and object recognition applications.

Course Content:

Section I			
Module No.	**Content**	**Hours**	**Weightage in%**
1.	**Introduction** What is Computer Vision - Low-level, Mid-level, High-level, Computer Graphics, Human Vision, Requirements and Issues, Fundamentals of Image Processing, Computer Vision Applications	03	10
2.	**Image Formation: Geometry and Photometry** 2-D Projective Geometry, Geometry Primitive and Transformation, Photometric Image formation, Camera Geometry Models, Construction of 3D Model from images	06	20
3.	**Feature extraction and Image Segmentation** Feature detection and description, Feature matching and Model fitting, Various methods of image Segmentation, Edge Detection	06	20
Section II			
4.	**Motion Estimation** Motion Estimation, Motion Detection and Tracking, Structure from motion, Stereo Vision	06	20

5.	**Object Recognition** Detecting Objects in Images, Object detection using traditional Methods, HIFT Features, Current Strategies for Object recognition, Face Recognition, Deep learning methods for object recognition	09	30
	TOTAL	30	100

List of practical:

Sr. No	Name of Practical	Hours
1.	Implement Image Processing algorithms	05
2.	Implement Camera calibration methods	10
3.	Construct 3D model from Image	04
4.	Implement Segmentation method	10
5.	Implement Object detection models	10
6.	Face Detection and Recognition	05
7.	Create Application based on real world problem using computer vision	06
6.	Implement methods of deep learning for object recognition	10
	TOTAL	60

Text Book(s):

Title	Author/s	Publication
Computer Vision - A modern approach	David Forsyth, Jean Ponce	Pearson
Computer Vision: Algorithms and Applications	Richard Szeliski	Springer

Reference Book(s):

Title	Author/s	Publication
Image Processing, Analysis and Machine Vision	Milan Sonka, Vaclav Hlavac, Roger Boyle	Global Engineering:Timothy L. Anderson
Deep Learning: Algorithms and Applications	I. Goodfellow, Y. Bengio and A. Courville	

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

- ContinuousEvaluation will be cumulative of practical performances, activities, presentations, viva and submissions consisting of 40 marks.
- Practical performance/quiz/test consists of 30 marks during End Semester Exam.
- Viva/Oral performance of 30 marks during End Semester Exam.

Course Outcome(s):

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

SECE4070	COMPUTER VISION
CO 1	Understand and master basic knowledge, theories and methods in image processing and computer vision.
CO 2	Identify, formulate and solve problems in image processing and computer vision.
CO 3	Design and develop practical and innovative image processing and computer vision applications or systems.
CO 4	Conduct themselves professionally and responsibly in the areas of computer vision image processing and deep learning.
CO 5	Critically review and assess scientific literature in the field and apply theoretical knowledge to identify the novelty and practicality of proposed methods.

Mapping of CO with PO

SECE4070	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3											
CO 2	3	2										
CO 3	2		3									
CO 4						3		3				
CO 5	3	3										

Mapping of CO with PSO

SECE4070	PSO1	PSO2	PSO3
CO 1	1	3	3
CO 2	3	3	3
CO 3	3	2	3
CO 4		1	2
CO 5		3	1

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction	1,3
2	Image Formation: Geometry and Photometry	2,3,5
3	Feature extraction and Image Segmentation	2,5,6
4	Motion Estimation	1,5,6
5	Object Recognition	2,4,5,6

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Course Code: SECE4080
Course Name: Natural Language Processing
Prerequisite Course (s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to,

- comprehend the key concepts of NLP which are used to describe and analyze language.
- illustrate computational methods to understand language phenomena of word sense.
- design and develop applications with natural language capabilities.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Introduction to NLP, History of NLP, Advantages of NLP,Disadvantages of NLP, Components of NLP, Applications of NLP, Phases of NLP, Challenges in NLP, NLP Libraries	10	25
2.	**Language Modelling and Text Representation** Unigram Language Model, Bigram, Trigram, N-gram, Applications of Language Modeling, Bag of Word Model, Skip gram, Continuous Bag-Of-Words, Embedding representations for words Lexical Semantics, Feature Weighing Techniques, Parts of Speech Tagging, Morphology	12	25
Section II			
3.	**Word Sense Disambiguation** Word Sense Disambiguation, Knowledge Based and Supervised Word Sense Disambiguation, Introduction to WordNet	11	25
4.	**Text Analysis, Summarization and Machine Translation** Sentiment Mining, Text Classification, Text Summarization, Information Extraction, Named Entity Recognition, Relation Extraction, Question Answering in	12	25

	Multilingual Setting; NLP in Information Retrieval, Cross-Lingual IR, Machine Translation, MT Approaches, Direct Machine Translations, Rule-Based Machine Translation, Knowledge Based MT System, Statistical Machine Translation (SMT)		
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practicals	Hours
1.	Introduction to NLP and related packages in Python	04
2.	Text Normalization	04
3.	Part of Speech tagging experiments	04
4.	Root word conversion (stemming and Lemmatization)	08
5.	Morphological analysis of text	04
6.	N-gram analysis of text	04
7.	Implementation of Bag of word model with different weighing techniques	04
8.	Implementation of word sense disambiguation models	04
9.	WordNet usage-based experiment	08
10.	Named Entity Recognition experiment	08
11.	Text Classification based experiment	08
	TOTAL	60

Reference Book(s):

Title	Author/s	Publication
Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition,	Jurafsky, David, and James H. Martin	PEARSON
Foundations of Statistical Natural Language Processing.	Manning, Christopher D., and HinrichSchütze.	Cambridge, MA: MIT Press
Natural Language Understanding.	James Allen.	The Benjamin/Cummings Publishing Company Inc..
Handbook of natural language processing.	Dale, R., Moisl, H., & Somers, H.,	CRC Press.

Web material link:

- https://nptel.ac.in/courses/106/105/106105158/
- http://www.nptelvideos.in/2012/11/natural-language-processing.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 performance of practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/test consists of 30 marks during End Semester Exam.
- Viva/ Oral performance consists of 30 marks during End Semester Exam.

Course Outcome(s):

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

SECE4080	**NATURAL LANGUAGE PROCESSING**
CO 1	Extract information from text automatically using concepts and methods from natural language processing (NLP) including stemming, n-grams, POS tagging, and parsing.
CO 2	Develop speech-based applications that use speech analysis (phonetics, speech recognition, and synthesis)
CO 3	Analyze the syntax, semantics, and pragmatics of a statement written in a natural language.
CO 4	Write scripts and applications in Python to carry out natural language processing using libraries such as NLTK, Gensim, and spaCY.
CO 5	Design NLP-based AI systems for question answering, text summarization, and machine translation.

Mapping of CO with PO

SECE4080	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3		3									
CO 2	3		3									
CO 3	3		1	3								
CO 4	3				3							
CO 5			3									3

Mapping of CO with PSO

SECE4080	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	
CO 4	3	3	
CO 5	3	3	2

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	1,2
2	Language Modelling and Text Representation	3,4

3	Word Sense Disambiguation	3,4
4	Text Analysis, Summarization and Machine Translation	4,5,6

P P Savani University
School of Engineering
Department of Computer Science Engineering (ML & AI)

Course Code: SEML4910
Course Name: Project/Summer Internship
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	--	--	100	--	--	--	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
	TOTAL	100

Course Outcome(s):
After completion of the course, the student will be able to,

SEML4910	PROJECT/SUMMER INTERNSHIP
CO 1	Apply fundamental and disciplinary concepts and methods in ways appropriate to their principal areas of study.
CO 2	Determine the challenges and future potential for his/her internship organization in particular and the sector in general.
CO 3	Test the theoretical learning in practical situations by accomplishing the tasks assigned during the internship period.
CO 4	Apply various soft skills such as time management, positive attitude and communication skills during performance of the tasks assigned in internship

	organization.
CO 5	Analyze the functioning of internship organization and recommend changes for improvement in processes.

Mapping of CO with PO

SEML4910	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	3	3	3	3		3		2		2	3
CO 2		3	2	3	1	3	3	3	2		2	3
CO 3	1	3	3	3	3	3	3	3	2		2	3
CO 4		1	1	1	1	2	3	3	3	3		3
CO 5		2	1	2	2	2	3	3	3			3

Mapping of CO with PSO

SEML4910	PSO1	PSO2	PSO3
CO 1	3	1	3
CO 2	3	3	3
CO 3	3	3	2
CO 4	1	3	1
CO 5		3	3

P P Savani University
School of Engineering
Department of Computer Science Engineering (ML & AI)

Course Code: SEML4920
Course Name: Project - IV
Prerequisite Course(s): --

Teaching & Examination Scheme:

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

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 Project:

Sr. No	Project 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
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.
2.	**Literature Review** Study of various technology or area to select a topic of the seminar.
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.
4.	**Implementation** Students must implement their proposal in any of the programming languages.
5.	**Report Writing**

	The report must be prepared as per suggested guidelines consisting of Preamble, Objectives, Scope, Introduction, Conclusions, Recommendations and Annexure.
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.

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 work 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
	Total:	**100**

The entire evaluation will be converted equivalent to 100 Marks.

Course Outcome(s):

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

SEML4920	PROJECT-IV
CO 1	Distinguish and analyze the issues related to various existing system.
CO 2	Experiment on problem with the help of latest technologies.
CO 3	Documenting the project work in a proper format.
CO 4	Facilitate society with recent technological advancement.

Mapping of CO with PO

SEML4920	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1	1	2	1			1				2
CO 2	1	2	1	2	1					1	2	
CO 3		1	1				2				1	
CO 4						2	1					

Mapping of CO with PSO

SECE4920	PSO1	PSO2	PSO3
CO 1	3	3	2
CO 2	3	3	2
CO 3	3	3	3
CO 4	3	3	3

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE4530
Course Name: Research Methodology
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	--	01	03	40	60	--	--	50	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help students to,

- provide brief knowledge about research and its various terminologies.
- Understand the possible area of research in computer science.

Course Content:

Section I			
Module No.	**Content**	**Hours**	**Weightage in %**
1.	**Introduction** Introduction to research problem, sources of finding a research problem, characteristics of a research problem, pitfalls in selecting a research problem, scope and objectives of research problem, approaches of investigation of solutions for research problem.	03	10
2.	**Research Process** Finding Good Literature, Decide which sources you will need, Differentiate between journals, conferences, books, magazines and their quality, Understand how to establish their quality and authenticity, Finding Information, How to conduct effective searches, How to find relevant papers related to your area of research, How to capture critical information, Identify main ideas in scholarly literature, Understand and identify the bias, theoretical position and evidence produced, Write notes to organize your ideas, Compare ideas and concepts from different papers.	05	20
3.	**Research Methodology** Writing and Presenting your Work, Effective technical writing, how to write Report, Paper, developing a Research Proposal, Format of research proposal, build your argument, Recognize the importance of emphasizing your point, distinguish between your point and the evidence available, Acknowledge	07	20

	the evidence, Check the logistics of your presentation, Identify the key message of your presentation, Understand the expectations and what will be the key review points, prepare for delivery of your Oral presentation, Rehearse and time your presentation, prepare to answer questions from the audience: Fundamental concepts should be spoken from memory as reviewer will be looking for evidence of your thorough understanding		
	Section II		
4.	**Intellectual Property Rights** Introduction and significance of intellectual property rights, types of Intellectual Property Rights, copyright and its significance, introduction to patents and its filing, introduction to patent drafting, best practices in national and international patent filing, copyrightable work examples.	05	15
5.	**Patent Right** Patents and its basics, patentable items, designs, process of filing patent at national and international level, process of patenting and development, technological research and patents, innovation, patent and copyright international intellectual property, procedure for grants of patents, need of specifications, types of patent applications, provisional and complete specification, patent specifications and its contents, trade and copyright.	05	20
6.	**New Developments in Intellectual Property Rights(IPR)** Administration of patent system in India, India's stand in the world of IPs, new developments in IPR at national and international level, prosecution (filing) PCT / international filing, national phase filing, scope of patent rights, licensing and transfer of technology, patent information and databases, geographical indications, basic laws related to patent filing, case studies- IPR of Hardware, computer software.	05	15
	TOTAL	30	100

List of Tutorials:

Sr. No.	Name of Tutorial	Hours
1.	Conduct good literature survey.	03
2.	Preparation of research proposal.	03
3.	Study reference management tools.	03
4.	Study new development in intellectual property rights and patent rights.	03
5.	Write research article.	03
	TOTAL	15

Reference Book(s):

Title	Author/s	Publication
Resisting Intellectual Property	Halbert	Taylor &Francis Ltd

Introduction to Design	Rajesh Kariya	Prentice Hall
Research methodology: an introduction for science &engineering students	Stuart Melville and Wayne Goddard	Juta & CoLtd
Intellectual Property Rights Under WTO	T. Ramappa	S. Chand,2008
Research Methodology: A Step by Step Guide for Beginners	Ranjit Kumar	Pearson

Additional Readings:

- Students will be assigned and will select additional readings based on their research areas.

Web material link:

- https://nptel.ac.in/courses/121/106/121106007/

Course Evaluation:

Theory:

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

Tutorial:

- Continuous Evaluation consists of the performance of tutorials which will be evaluated out of 10 marks for each tutorial and average of the same will be converted to 50 marks.

Course outcome(s):

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

SECE4530	**RESEARCH METHODOLOGY**
CO 1	Create a quality literature review and find the research gap.
CO 2	Identify the relevant problem and methods to find its solution.
CO 3	Summarize the solution obtained in an effective manner.
CO 4	Propose research ethics.
CO 5	Review ipr protection for further research and better products.

Mapping of CO with PO

SECE4530	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	3	3	3	3	3	3	1	3	3	3
CO 2	3	3	3	3	3	3	3		3	3	3	3
CO 3	3	3	3	3	3	3	3	3	3	3	3	3
CO 4	3	3	3	3	3	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	3	3	3	3	3

Mapping of CO with PSO

SECE4530	PSO1	PSO2	PSO3

CO 1	3	3	2
CO 2	3	3	2
CO 3	3	3	3
CO 4	3	3	3
CO 5	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	1,2
2	Finding Good Literature	2,3,4
3	Writing and Presenting your Work	3,4,6
4	Intellectual Property Rights	2
5	Patent Right	2,4
6	New Developments in Intellectual Property Rights (IPR)	2,4

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT4521
Course Name: Blockchain Technology
Course Prerequisite(s): SECE2071 - Data Structures & Algorithms

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	--	03	40	60	20	30	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help the learners to,
- understand blockchain and its applications.
- analyze IBM's strategy in blockchain platform.
- understand security in blockchain based networks.

Course Content:

Section I			
Module No	Content	Hours	Weightage in %
1.	**Introduction to Blockchain** Blockchain types, Public key cryptography, Hashing, Digital Signature, Business networks, Assets, Ledgers, Transactions and Contracts, the problem with existing networks, how blockchain solves this problem, Requirements of a blockchain for business.	05	10
2.	**Blockchain Networks** Overview of active networks, TradeLens - Improving global trade, IBM Food Trust - Supply Chain Transparency, IBM World Wire - Global Payments, Decentralised and Trusted Identity, Further Examples by Industry, Key Players for Blockchain Adoption	05	20
3.	**IBM and Blockchain** How IBM can help with a Blockchain Project, IBM's Blockchain strategy, the IBM Blockchain Platform, The Linux Foundation's Hyperledger Project, Hyperledger Fabric, Continuing your Blockchain Journey	05	20
Section II			
Module No	Content	Hours	Weightage in %
4	**Blockchain composed** What is Hyperledger Composer, Components and Structure of Composer, An example Business Network: Car Auction Market, Extensive, Familiar, Open Tool Set	05	10

5.	**Blockchain fabric development** Participants and Components Overview, Developer Considerations	05	20
6.	**Blockchain architecture** Administrator (operator) Considerations, Security: Public vs. Private Blockchains, Architect Considerations, Network Consensus Considerations	05	20
	TOTAL	30	100

List of Practical:

Sr No	Name of Practical	Hours
1.	Demo - Vehicle Lifecycle Demo: Transfer assets in blockchain	04
2.	Demo of Hyperledger Composer	04
3.	Create a Hyperledger Composer solution	06
4.	Write your first blockchain application	08
5.	Build your own network	08
	TOTAL	30

Text Book:

Title	Author/s	Publication
Blockchain Basics – A Non-Technical Introduction in 25 Steps.	Daniel Drescher	Apress

Reference Book:

Title	Author/s	Publication
Mastering Blockchain	Imran Bashir	Packt
The Business Blockchain – Promise, practice, and application of the next internet technology.	William Mougayar	Wiley

Web Material Link(s):

- https://www.udemy.com/course/blockchain-and-bitcoin-fundamentals/
- https://cognitiveclass.ai/courses/blockchain-course
- https://www.coursera.org/courses?query=blockchain

Course Evaluation:

Theory:

- Continuous Evaluation Consists of Two Tests; evaluation of each test consists of 15 marks. The duration of each test is 60 minutes.
- Students have to appear for a quiz/group discussion, which consists of 10 marks.
- End Semester Examination will consist of 60 Marks.

Practical:

- Continuous Evaluation consists of performance of practical, which should be evaluated out of 10 per each practical. At the end of the semester, average of the entire practical will be converted to 10 Marks.
- Internal Viva consists of 10 marks.

- Practical performance/quiz/test of 15 Marks during End Semester Exam.
- Viva/Oral performance of 15 Marks during End Semester Exam.

Course Outcome(s):

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

SEIT4521	BLOCKCHAIN TECHNOLOGY
CO 1	Analyze the importance of blockchain in several industries by performing extensive case studies.
CO 2	Construct blockchain based applications with the help of different frameworks and tools.
CO 3	Design cryptocurrency related applications by utilizing blockchain technology concepts.
CO 4	Evaluate the performance metrics of blockchain applications using python based analytics.

Mapping of CO with PO

SEIT4521	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	2	2	1	1		1	3		1		1
CO 2	1	1	1	1	1			1			1	1
CO 3	1	1	1	1	1	3		1		1		1
CO 4		1	1	1	3	3		1			2	2

Mapping of CO with PSO

SEIT4521	PSO1	PSO2	PSO3
CO 1	2		1
CO 2	2	1	3
CO 3	1	2	2
CO 4			2

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction to Blockchain	1,2,4
2	Blockchain Networks	2,3,4
3	IBM & Blockchain	2,4,5
4	Blockchain Composed	1,3,6
5	Blockchain fabric development	2,6
6	Blockchain architecture	1,2,3,6

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT4530
Course Name: Cyber Security
Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to,

- identify and classify various cybercrimes with respect to organizational weaknesses in order to mitigate the security risk and estimate the impact on society and world.
- interpret and apply Indian IT laws in various legal issues.

Course Content:

Section – I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Cyber Security** Overview of Cyber Security, Internet Governance – Challenges and Constraints, Cyber Threats: - Cyber Warfare-Cyber Crime-Cyber Terrorism-Cyber Espionage, need for a Comprehensive Cyber Security Policy, need for a Nodal Authority, Need for an International convention on Cyberspace, Security Standards.	03	10
2.	**Cyber Security Vulnerabilities and Cyber Security Safeguards** Cyber Security Vulnerabilities-Overview, vulnerabilities in Software, System Administration, Complex Network Architectures, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness, Cyber Security Safeguards- Overview, Access Control, Audit, Authentication, Biometrics, Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection System, Response, Scanning, Security Policy, Threat Management	06	20
3.	**Securing Web Application, Services and Servers** Introduction, Basic security for HTTP Applications and Services, Basic Security for SOAP Services, Identity Management and Web Services, Authorization Patterns, Security Considerations,	03	10

	Challenges		
4.	**Intrusion Detection and Prevention** Intrusion, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection, Intrusion detection and Prevention Techniques, Anti-Malware software, Network based Intrusion detection Systems, Network based Intrusion Prevention Systems, Host based Intrusion prevention Systems, Security Information Management, Network Session Analysis, System Integrity Validation	03	10
Section – II			
Module No.	Content	Hours	Weightage In %
5.	**Cryptography and Network Security** Introduction to Cryptography, Symmetric key Cryptography, Asymmetric key Cryptography, Message Authentication, Digital Signatures, Applications of Cryptography. Overview of Firewalls-Types of Firewalls, User Management, VPN Security Security Protocols: - security at the Application Layer- PGP and S/MIME, Security at Transport Layer- SSL and TLS, Security at Network Layer-IPSec	05	17
6.	**Cyberspace and the Law** Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2013	05	17
7.	**Cyber Forensics** Introduction to Cyber Forensics, Handling Preliminary analysis, Investigating Investigations, Controlling an Investigation, conducting disk-based Information-hiding, Scrutinizing E-mail, Validating E-mail Header information, Tracing Internet access, Tracing Memory in real-time.	05	16
	TOTAL	30	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	TCP scanning using NMAP	02
2.	Port scanning using NMAP	02
3.	TCP / UDP connectivity using Netcat	02
4.	Network vulnerability using OpenVAS	04
5.	Web application testing using DVWA	02
6.	Manual SQL injection using DVWA	04
7.	XSS using DVWA	04
8.	Automated SQL injection with SqlMap	04
9.	Write a program to create and simulate an attack. Then explain how to avoid it.	06
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Cybersecurity for Beginners	Raef Meeuwisse	Cyber Simplicity Ltd

Reference Book(s):

Title	Author/s	Publication
Cyber Security	Nina Godbole, SunitBelapure	Wiley India, New Delhi
Anti-Hacker Tool Kit,4th Edition	Mike Shema	McGrawHill Publication
The Indian Cyber Law	Suresh T. Vishwanathan;	Bharat Law House New Delhi
Handbook of Applied Cryptography	Menezes, van Oorschot and Vanstone	CRC Press
Computer Security, 3/e	Gollmann	Wiley

Web Material Link(s):

- https://nptel.ac.in/courses/106105031/
- https://www.javatpoint.com/cyber-security-tutorial

Course Evaluation:

Theory:

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

Practical:

- Continuous Evaluation consists of 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/drawing/test consists of 15 marks during End Semester Exam.
- Viva/ Oral performance consists of 15 marks during End Semester Exam.

Course Outcome(s):

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

SEIT4530	CYBER SECURITY
CO 1	Examine implications of cyber frauds and cybercrimes on end user and national infrastructure.
CO 2	Illustrate various aspects of cyber security, cybercrimes and its related laws in indian and global act.
CO 3	Develop security and privacy based modern applications to protect people and to prevent cybercrimes.
CO 4	Employ the knowledge of advanced security technologies to ensure security.

Mapping of CO with PO

SEIT4530	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO 1	1				3							
CO 2	2	1										
CO 3	2	3	2	1	3	2	2					
CO 4	2				3							

Mapping of CO with PSO

SEIT4530	PSO1	PSO2	PSO3
CO 1	3		1
CO 2		1	3
CO 3		3	3
CO 4	3		3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction to Cyber Security	1, 2
2	Cyber Security Vulnerabilities and Cyber Security Safeguards	2, 3
3	Securing Web Application, Services and Servers	2,4
4	Intrusion Detection and Prevention	2,4
5	Cryptography and Network Security	2,3,4
6	Cyberspace and the Law	1, 3, 4
7	Cyber Forensics	2,3,4,6

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE4540
Course Name: Design Engineering
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	
02	--	01	03	40	60	--	--	50	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to,

- understand the broad scope of design engineering.
- recognize the main drivers for design engineering.
- describe how human variation impacts on design engineering.
- apply some basic concepts and methods from design engineering to explore creative solutions to clearly defined real world problems.

Course Content:

Section – I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Introduction to product innovation process (Need-requirement-concept-detail-prototype-services business)	04	15
2	**Task clarification and conceptualization: Problem-idea-solution-evaluation** ● Problem identification ● Ideation ● Consolidation ● Evaluation	06	20
3	**Design thinking process** ● Find goals or need ● Evaluate goals or need ● Generate proposals to satisfy goals ● Evaluate proposals ● Improve goals and proposals	05	15
Section – II			
Module No.	Content	Hours	Weightage In %
4	**Prototyping and Proofing the Design**	09	30

	● Technical systems (power plant) ● Educational systems (Montessori Method) ● Aesthetic systems (logo designs, advertisements) ● Legal systems ● Social, religious or cultural systems ● Theories, Models		
5	**Economic Decision Making** ● performance, safety, reliability ● ergonomics and aesthetics ● manufacturability ● cost, environment Project: developing the concept into a detailed design with a functional prototype	06	20
	TOTAL	30	100

List of Tutorial(s):

Sr. No	Name of Tutorial	Hours
1.	Domain Identification	02
2.	Observation – AEIOU Framework	02
3.	Empathy – Identify Unarticulated/Unmet needs of User	02
4.	Ideation – Mind Mapping	02
5.	Concept Finalization	02
6.	Product Development	05
	TOTAL	15

Reference Book(s):

Title	Author/s	Publication
Design Paradigms: A Sourcebook for Creative Visualization	Warren K. Wake	Wiley Publications

Web Material Links:

- https://www.edx.org/course/introduction-to-engineering-and-design
- https://www.mooc-list.com/tags/engineering-design

Course Evaluation:

- ContinuousEvaluation will be cumulative of tutorialperformances, activities, presentations, viva and submissions consisting of 50 marks.
- Internal theory exam of 30 marks each with be converted to 30 marks.
- External theory performance of 60 marks during End Semester Exam.

Course Outcome(s):

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

SECE4540	DESIGN ENGINEERING
CO 1	Learn the steps involved in design thinking.
CO 2	Decide on a solution economically.

CO 3	Make well-informed decisions during the design process, it is necessary to comprehend a variety of scientific, mathematical, and technical principles.
CO 4	Understand the impacts of issues like standards, risk, and patents on the practice of engineering.

Mapping of CO with PO

SECE4540	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3		2	2		3				3		
CO 2	3		1								3	
CO 3	3		1	3								
CO 4	3					3	3					

Mapping of CO with PSO

SECE4540	PSO1	PSO2	PSO3
CO 1	2	3	3
CO 2		3	1
CO 3			2
CO 4	1	3	1

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction	2
2	Task clarification and conceptualization: Problem-idea-solution-evaluation	2,3
3	Design thinking process	2,3,6
4	Prototyping and Proofing the Design	2,5,6
5	Economic Decision Making	3,4,5

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE4550
Course Name: Advanced Web Technology
Prerequisite Course (s): -- Basic Knowledge of HTML, CSS, JAVASCRIPT

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	--	03	40	60	20	30	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to,

- develop and manage advanced content and sites quickly and efficiently.
- design fast and consistent development of advanced websites.
- use JavaScript for dynamic effects.
- use JavaScript to validate form input entry.
- choose best technologies for solving web client/server problems.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction:** Features of Web 2.0. Concepts of effective web design, Web design issues including Browser, Bandwidth and Cache, Display resolution, Look and Feel of the Website, Page Layout and linking, User centric design, Sitemap, Planning and publishing website, Designing effective navigation	03	05
2.	**HTML5** Main Structure, Text, Forms, Video and Audio, Canvas, Data Storage, offline, Drag & Drop, Geolocation, Messages, Workers & Sockets	04	15
3.	**CSS3** Transparency, Gradients, Backgrounds, Round borders, Typography, Shadows, Transformations, Transitions, Layouts, Advanced Selectors, Flexible Box Model.	04	15
4.	**Advanced JavaScript** Error Handling, Validations, Animation, Multimedia, Debugging, Image Map, Browsers, JSON	04	15
Section II			

5.	**XML** Introduction to XML, uses of XML, simple XML, and XML key components, DTD and Schemas, Using XML with application.	03	10
6.	**PHP** Environment Setup, Variable Types, Constants, Operator Types, Decision Making, Arrays, Strings, Web Concepts, File Inclusion,GET&POST,Functions,Cookies,Sessions,SendingEmails,FileUploading	05	20
7.	**Advanced PHP and MySQL** Basic commands with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names, creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables,	07	20
	TOTAL	30	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Create a HTML5 web page which shows the use of Structural Element.	02
2.	Create a HTML5 web page which shows the use of Audio & Video.	02
3.	Create a HTML5 web page which shows the use of canvas.	02
4.	Create a HTML5 web page which shows the use of Geolocation.	02
5.	Create a HTML5 web page which shows the use of Data storage.	02
6.	Write a code for Mouse over the element to see a CSS3 transition effect.	02
7.	Write a code for Creating linear gradients using multiple color stops.	02
8.	Write a code for Creating text shadow effect.	02
9.	Write a code for Applying multiple transformation to an element.	02
10.	Write a code for Animating elements on a web page.	04
11.	Create a HTML5 form which displays some validation in text box using java script.	02
12.	Write a JavaScript code to handle Error.	02
13.	Write a JavaScript code to Show the use of Animation.	02
14.	Write a PHP code to shows the use of Decision Making.	02
	TOTAL	30

Reference Book(s):

Title	Author/s	Publication
Introducing HTML 5	Bruce Lowson & Remy Sharp	New Riders
Pro HTML5 and CSS3 Design Patterns (Expert's Voice in Web Development)	Michale Bowers & VictorSumner	Kindle Edition
Html5 And Javascript Web Apps	Wesley Hales,	O'REILLY
Beginning PHP and MySQL	Massimo Nardone and W Jason Gilmore Apress ,Fifth Edition	CRC Press.

PHP and MySQL Web Development: A Beginner's Guide	Marty Matthews	McGraw-Hill

Web material link:

- https://www.youtube.com/watch?v=MxoGyrFc-N4
- http://www-db.deis.unibo.it/courses/TW/DOCS/w3schools/css/css3_flexbox.asp.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 performance of practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/test consists of 30 marks during End Semester Exam.
- Viva/ Oral performance consists of 30 marks during End Semester Exam.

Course Outcome(s):

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

SECE4550	**ADVANCE WEB TECHNOLOGY**
CO 1	Produce appealing web pages using advanced features like HTML5, CSS3, and JavaScript.
CO 2	Create a valid and well-formed XML document
CO 3	Perform insert, edit, and delete data from a DBMS table, link a PHP programme to the DBMS.
CO 4	Create a dynamic website using JavaScript, DHTML, and PHP.

Mapping of CO with PO

SECE4550	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1		1	2	1	2				1			1
CO 2			1	1							1	
CO 3			1		1				1			
CO 4			2		1				2			2

Mapping of CO with PSO

SECE4550	PSO1	PSO2	PSO3
CO 1	3	2	3
CO 2	2	2	2
CO 3	3	3	2
CO 4	3	2	2

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	2
2	HTML5	2,3,5
3	CSS3	2,3,5
4	Advance JavaScript	3,6
5	XML	2,6
6	PHP	2,3,6
7	Advance PHP and MYSQL	2,3,6

P P Savani University
School of Engineering
Department of Computer Science & Engineering (ML & AI)

Course Code: SEML4940
Course Name: Project/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	
--	19	--	19	--	--	200	300	--	--	500

CE: Continuous Evaluation, ESE: End Semester Exam

Outline of the Course:

Project

- The project will be aligned with the aims of the engineering programme and its areas of specialization and shall be based on the recent trends in technology.
- The student shall carry out a comprehensive project at relevant academic / R&D / industrial organization.
- The student is required to submit a project report based on the work carried out.

Training

- The aim of this course is to use the internship experience to enable students to develop their engineering skills and practices.
- The student will be placed in industry/organization for 12 to 18 weeks and assessed for academic credit.
- The students may select industry on their own or one which is offered by institute.
- Students are expected to experience a real-life engineering workplace and understand how their engineering and professional skills can be utilized in industry.
- The student is required to submit a project report based on the work carried out.

Course Outcome(s):

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

SEML4940	**PROJECT/TRAINING**
CO 1	Support the theoretical learning with practice and integrate knowledge for engineering applications.
CO 2	Adapt to real time industry exposure and experience.
CO 3	Solve challenging projects for commercial, societal and environment benefit.
CO 4	Explain the importance of planning, documentation, punctuality and work ethics.
CO 5	Document the work which is carried out in proper format with industry standards.

Mapping of CO with PO

SEML4940	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	2	2		2				2	1		1
CO 2											2	2
CO 3		3	2									
CO 4								3	1		2	
CO 5						1	1	1		1	1	2

Mapping of CO with PSO

SEML4940	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3
CO 5	3		3