PPSU

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

B.TECH. (COMPUTER SCIENCE & ENGINEERING)

SYLLABUS BOOK

AY 2025-26

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 the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first-principles of mathematics, natural sciences and engineering sciences.
PO 3	Design/development of solutions:

PO No	PROGRAMME OUTCOMES
	Design solutions for complex engineering problems and design system-components or processes that meet specified needs with appropriate consideration for public health & safety, cultural, societal and environmental considerations.
PO 4	Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis & interpretation of data, and synthesis of information to provide valid conclusions for complex problems.
PO 5	Engineering Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering & IT tools including prediction and modelling to engineering activities, with an understanding of their limitations.
PO 6	The Engineer and The World: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice; understand the impact of engineering solutions in societal and environmental contexts, and demonstrate knowledge of, and need for, sustainable development.
PO 7	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO 8	Individual and Collaborative Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 9	Communication: Communicate effectively on engineering activities with the engineering community and with society at large—such as being able to write reports, design documentation, make effective presentations and give/receive instructions.
PO 10	Project Management and Finance: Demonstrate knowledge and understanding of engineering and management principles and apply these to one's work, as a member or leader in a team in a multidisciplinary environment to manage projects.
PO 11	Life-Long Learning:

PO No	PROGRAMME OUTCOMES
	Recognize the need for, and have the 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 ENGINEERING
PSO 1	Apply the knowledge of programming languages, data structures and Algorithms, data science, networks and software engineering principles for software product development.
PSO 2	Acquire & apply, knowledge, technical competency, analytical and designing skills for innovative solution of industry problems & applied research in the field of Computer Science &Engineering.
PSO 3	Prepare technically competent employee, researcher, entrepreneur, and excel in competitive exams, and increase passion for 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.

(B. TECH. COMPUTER SCIENCE & ENGINEERING)

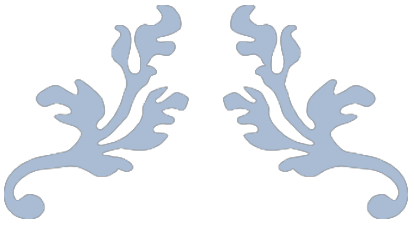
P P Savani University

School of Engineering

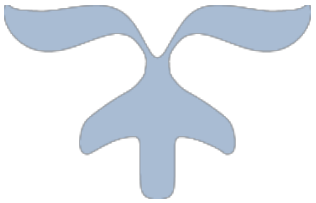
Effective From: 2025-26

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 PROGRAMME AY: 2025-26

Sem	Course Code	Course Title	Offered By	Teaching Scheme					Examination Scheme						
				Contact Hours				Credit	Theory		Practical		Tutorial		Total
				Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
1 OR 2	SESH1110	Calculus	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SEME1210	Basics of Mechanical Engineering	ME	3	0	2	5	5	40	60	0	0	40	60	200
	SEIT1210	Python for Engineers	IT	3	2	0	5	4	40	60	40	60	0	0	200
	SESH1130	Experimental Physics	SH	3	2	0	5	4	40	60	40	60	0	0	200
	CFLS2130	Intermediate Communicative English	CFLS	3	0	0	3	3	100	0	0	0	0	0	100
	SESH1120	Linear Algebra	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SECV1210	Basics of Civil Engineering	CV	3	0	2	5	5	40	60	0	0	40	60	200
	SECE1210	Programming with C Essentials	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SEEC1210	Basics of Electrical and Electronics	EC	3	2	0	5	4	40	60	40	60	0	0	200
	SEME1220	Engineering Workshop	ME	0	2	0	2	2	0	0	100	00	0	0	100
	SECE1220	Digital Proficiency	CE	3	0	0	3	3	40	60	0	0	0	0	100
						Total	**48**	**44**							**1900**

Group 1	SESH1110	Calculus	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SEME1210	Basics of Mechanical Engineering	ME	3	0	2	5	5	40	60	0	0	40	60	200
	SEIT1210	Python for Engineers	IT	3	2	0	5	4	40	60	40	60	0	0	200
	SESH1130	Experimental Physics	SH	3	2	0	5	4	40	60	40	60	0	0	200
	CFLS2130	Intermediate Communicative English	CFLS	3	0	0	3	3	100	0	0	0	0	0	100
						Total	**23**	**21**							**900**
Group 2	SESH1120	Linear Algebra	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SECV1210	Basics of Civil Engineering	CV	3	0	2	5	5	40	60	0	0	40	60	200
	SECE1210	Programming with C Essentials	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SEEC1210	Basics of Electrical and Electronics	EC	3	2	0	5	4	40	60	40	60	0	0	200
	SEME1220	Engineering Workshop	ME	0	2	0	2	2	0	0	100	00	0	0	100
	SECE1220	Digital Proficiency	CE	3	0	0	3	3	40	60	0	0	0	0	100
						Total	**25**	**23**							**1000**

P P Savani University
School of Engineering

Department of Science and Humanities

Course Code: SESH1110
Course Name: Calculus
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	
03	-	02	05	40	60	-	-	100	-	200

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 convergence or divergence of any infinite series and power series for learning advanced Engineering Mathematics.
- acquire knowledge of partial differentiation and ability to work with applications to advanced Engineering Mathematics.
- application of concavity of graph and find out points of inflection.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Calculus** Limits, Continuity, Types of Discontinuity, Successive Differentiation, Rolle's Theorem, LMVT, CMVT, Maxima and Minima.	09	20
2.	**Sequence and Series-I** Convergence and Divergence, Comparison Test, Integral Test, Ratio Test, Root Test, Alternating Series, Absolute and Conditional Convergence.	09	20
3.	**Sequence and Series-II** Power series, Taylor and Maclaurin series, Indeterminate forms and L'Hospital's Rule.	05	10
4.	**Partial Derivatives** Function of several variables, Partial differentiation, Applications, Chain rule, Linear approximations, Maxima and Minima, Euler's theorem, Lagrange multiplier.	11	30
5.	**Curve tracing** Tracing of Cartesian Curves, Polar Coordinates, Polar and Parametric Form of Standard Curves, Areas and Length in Polar co-ordinates	11	20
	TOTAL	45	100

List of Tutorials:

Sr. No.	Name of Tutorial	Hours
1.	Calculus-1	04
2.	Calculus-2	04
3.	Calculus-3	02
4.	Sequence and Series-1	04
5.	Sequence and Series-2	02
6.	Sequence and Series-3	02
7.	Partial Derivatives-1	04
8.	Partial Derivatives-2	02
9.	Curve tracing-1	04
10.	Curve tracing-2	02
	TOTAL	30

Text Book:

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:

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	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 ofthe 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 50 marks
- Continuous Evaluation consists of self-performance assignment to 20 marks.
- Internal Viva consists of 30 marks.

Course Outcome(s):

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

SESH1110	CALCULUS
CO 1	Recall the concepts of limit, continuity and differentiability for analysing mathematical problems.
CO 2	Analyze the series for its convergence and divergence to solve real world problems.

CO 3	Evaluate various limit problems using L' Hospital's rule.
CO 4	Identify the ordinary differentials and partial differentials and solve the maximum and minimum value of function.
CO 5	Construct the graphs for function with intervals and identify more application for function.

Mapping of CO with PO

SESH1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	2	3	1	1							1
CO 2	3	2	1								1
CO 3	2	2	1								
CO 4	2	2	1	1							1
CO 5	2	2	1								1

Mapping of CO with PSO

SESH1110	PSO1	PSO2	PSO3
CO 1		2	1
CO 2		2	1
CO 3		2	1
CO 4		2	1
CO 5		2	1

Level of Bloom's 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, 5
2	Sequence and Series – I	1, 2, 3, 4, 6
3	Sequence and Series – II	1, 2, 3, 4, 6
4	Partial Derivatives	1, 2, 3, 4, 5
5	Curve tracing	1, 2, 3, 4, 5, 6

P P Savani University
School of Engineering

Department of Mechanical Engineering

Course Code: SEME1210
Course Name: Basics of Mechanical Engineering
Prerequisite Course(s): -- None

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	-	-	40	60	200

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:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Boiler:** Introduction, Fundamental Principles, Classification	07	15
2.	**Classification of Engineering Materials:** Classification of engineering material, composition of cast iron, mechanical properties and uses; Alloy steel and their applications; Stress-Strain diagram, Hooks law and modulus of elasticity. Tensile, shear and hardness.	10	20
3.	**Fluids:** Fluid properties, pressure, density and viscosity; pressure variation with depth, static and kinetic energy; Bernoulli's equation for incompressible fluids, viscous and turbulent flow and Metacentric height.	04	08
4.	**Measurement:** Temperature, pressure, velocity, flow, strain, force and torque measurement, concept of measurement error & uncertainty analysis, measurement by Vernier caliper, micrometer, dial gauges, slip gauges, sine-bar and combination set.	06	12
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	09

7.	**Basics of I.C Engines:** Construction and Working of 2 Stroke & 4 Stroke Petrol andDiesel Engines, Difference Between 2-Stroke - 4 Stroke Engine & Petrol-Diesel Engine, Efficiency of I. C. Engines	08	18
8.	**Power Transmission Elements:** Construction and Applications of Couplings, Clutches and Brakes, Difference Between Clutch and Coupling, Types ofBelt Drive and Gear Drive	06	18
	TOTAL	45	100

List of Tutorials:

Sr. No.	Name of Tutorials	Hours
1.	To understand construction and working of various types of boilers	04
2.	To understand construction and working of mountings	04
3.	To understand construction and working of accessories	04
4.	To understand construction and working 2 –stroke & 4 –stroke Petrol Engines	04
5.	To understand construction and working 2 –stroke & 4 –stroke Diesel Engines	04
6.	To understand the types of hardness test	04
7.	To understand the stress-strain curve for ductile and brittle material	04
8.	To understand the basic concept of metacentric height	02
	TOTAL	30

Text Book(s):

Title	Author(s)	Publication
Elements of Mechanical Engineering	S. B. Mathur, S. Domkundwar	Dhanpat Rai & Sons Publications
Material Science	Narula	TMH
Basic Mechanical Engineering	Agrawal B & CM	TMH
Instrumentation and Measurement	Nakra and Chaudhary	TMH
Combustion Engines	Ganesan	TMH.

Reference Book(s):

Title	Author(s)	Publication
Thermal Engineering	R. K. Rajput	Laxmi Publications
Basic Mechanical Engineering	T.S. Rajan	Wiley Eastern Ltd., 1996.

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.

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 40 marks.
- External Practical viva consists of 60 marks.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SEME1210	BASICS OF MECHANICAL ENGINEERING
CO 1	Understand the concept of Boiler, Material types and its application.
CO 2	Understand the Fluid properties and measurement process.
CO 3	Understand the concept of basic thermodynamics
CO 4	Comprehend the importance of mechanical engineering equipments like IC engine and power transmission elements.
CO 5	Analyze mechanical properties of materials and apply concepts of stress–strain relationships and elasticity in engineering problems.

Mapping of CO with PO

SEME1210	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	2	3	1	3	2	2					2
CO 2	2	3	1	3	2	2					2
CO 3	1	3	1	3	2	2					2
CO 4	1	3	1	3	2	2					2
CO 5	1	3	1	1	2	2					2

Mapping of CO with PSO

SEME1210	PSO1	PSO2	PSO3
CO 1		2	1
CO 2		2	1
CO 3		2	1
CO 4		2	2
CO 5		3	2

Level of Bloom's 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 Boiler	1, 2, 3
2	Classification of Engineering Materials	1, 2
3	Fluids	1, 2
4	Measurement	1, 2
5	Basics Concept of Thermodynamics	1, 2, 3
6	Basics of I.C. Engines	1, 2
7	Power Transmission Elements	1, 2

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT1210
Course Name: Python for Engineers
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	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand the basic object-oriented programming.
- identify an appropriate approach to solve computational problems.
- develop logic building and problem-solving skills.

Course Content:

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, Assignment, Types, Basic Operators, Expressions and Types of Data Int, Float, Complex, String, List, Tuple, Set, Dictionary and its Methods, Type Conversions, Comments, Input Processing and output.	04	07
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	07
3.	**Array and Strings in Python** Arrays, Basic Strings, Accessing Strings, Basic Operations, String Slicing, Testing, Searching and Manipulating Strings, Function and Methods.	03	08
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 Methods. List, Accessing List, Operations, Working With Lists, Function and methods, two-dimensional lists.	05	10
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	14
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, Overloading Operators. Objects in Python: Creating Python Classes, Modules and Packages, Inheritance in Python, Polymorphism in Python.	08	16

7.	**Files & Regular Expression in Python** Introduction to File Input and Output, Writing Data to a File, Reading Data from a File, Additional File Methods, Using Loops to Process Files, Processing Records, RE Module, Basic Patterns, Regular Expression Syntax, Regular Expression Object, Search Object, Findall method, Split method, Sub Method.	05	15
8.	**Exception Handling in Python** Handling IO Exceptions, Working with Directories, Metadata, Errors, Run Time Errors, The Exception Model, Exception Hierarchy, Handling Multiple Exceptions, Throwing Mechanism, Catching Mechanism	05	09
9.	**Building Desktop Application** Exploring the Tkinter Library in Python, Creating basic Desktop application using Tkinter	04	14
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to Python (Introduction to IDLE, different data types, Input Output in Python, Operators, Operator precedence).	04
2.	Manipulation of Strings.	04
3.	Implementation of Dictionaries, Sets in Python.	03
4.	Implementation of Tuples and Lists in Python.	03
5.	Working with decision structures in Python	04
6.	Working with functions and modules in Python	02
7.	Working with Object-oriented paradigms in Python	04
8.	Implementation of file handling in Python.	02
9.	Exception handling in Python	02
10.	Building desktop application of your own calculator in Python.	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Python approach Programming: A modular	Sheetal Taneja, Naveen Kumar	Pearson

Reference Book(s):

Title	Author(s)	Publication
Think Python: How to Think Like a Computer Scientist	Allen Downey	Green Tea Press
Python Cookbook	David Ascher, Alex Martelli Oreilly	O Reilly Media

Web Material Link(s):

- https://www.tutorialspoint.com/python/
- https://www.w3schools.com/python/
- https://onlinecourses.nptel.ac.in/noc20_cs83/preview

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

SEIT1210	PYTHON FOR ENGINEERS
CO 1	Interpret the fundamental python syntax, semantics and fluent in the use of python control flow statements.
CO 2	Determine the methods to create and manipulate python programs by utilizing the data structures like lists, dictionaries, tuples and sets.
CO 3	Articulate the object-oriented programming concepts such as encapsulation, inheritance and polymorphism as used in python.
CO 4	Identify the commonly used operations involving file systems and regular expressions.
CO 5	Design object-oriented and GUI-based Python applications.

Mapping of CO with PO

SEIT1210	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11
CO 1	2	2			2				1		1
CO 2	3	3	1		3				1		2
CO 3	2	3	2		2				1		2
CO 4	2	2	1	1	3				1		2
CO 5	2	2	3	1	3	1		1	2	1	2

Mapping of CO with PSO

SEIT1210	PSO1	PSO2	PSO3
CO 1	2	1	1
CO 2	3	2	1
CO 3	3	2	1
CO 4	2	2	1
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 to Python	1,2,4
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	3,4,6
7.	Files & Regular Expression in Python	3,4.6
8.	Exception Handling in Python	3,4,5

9.	Building Desktop Application	2,3,4

P P Savani University
School of Engineering

Department of Science and Humanities

Course Code: SESH1130
Course Name: Experimental 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	00	04	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- 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:

Module No.	Content	Hours	Weightage in %
1	**QUANTUM PHYSICS** (Prerequisites: Dual nature of radiation, Photoelectric effect Matter waves, wave nature of particles, de-Broglie relation, Davisson-Germer experiment). Introduction; De Broglie hypothesis of matter waves; Properties of matter waves; Wave function; Physical interpretation of wave function; Phase velocity and group velocity and their relation; Heisenberg uncertainty principle; non-existence of electron in nucleus; Schrodinger's time dependent wave equation; time independent wave equation; Quantum Computing (overview).	07	16
2	**Acoustic and Ultrasonic** (Prerequisites: Sound, propagation of sound, concept of frequency and wave length). Acoustic – Introduction, Classification and Characterization of Sound, Sabine's formula for reverberation (without derivation), Absorption Coefficients, Sound Absorbing Materials, factors affecting the acoustics of buildings and remedies, Sound Insulation. Ultrasonic – Introduction, Properties of Ultrasonic, Generation of Ultrasonic sound: Piezoelectric & Magnetostriction effect, Applications of Ultrasonic.	07	16
3	**LASER AND FIBRE OPTICS** (Prerequisites: Absorption, recombination, Valance and conduction bands, refractive index of a material, Snell's law) LASER – Introduction, Characteristics, Absorption, Spontaneous and stimulated emission; metastable state, population inversion, Pumping mechanism, components of LASER; Nd:YAG Laser, Applications of LASER, Interference, Diffraction, Diffraction grating. FIBRE OPTICS – Introduction, Optical Fiber construction, working principle and types, Numerical Aperture, Acceptance angle and	09	18

	Attenuation, Fiber optic communication system, Applications of Optical Fiber.		
4	**NANOSCIENCE AND NANOTECHNOLOGY** (Prerequisites: Nano scale and structures, general purpose of nano technology, method of formation of nano structure, fullerenes, carbon nanotubes). Nanomaterials : Properties (Physical, Mechanical, Optical, Electrical, Magnetic); Surface to Volume Ratio; Synthesis of Nanomaterials: Bottom up and Top down technique; Methods to synthesize nanomaterials: PVD & Sol-gel, Applications.	06	14
5	**SUPERCONDUCTORS** (Prerequisites: Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current, Ohm's law, electrical resistance, V-I characteristics (linear and non-linear), electrical resistivity and conductivity temperature dependence of resistance). Superconductors: Introduction, Critical temperature, Properties of superconductors, Type of superconductors: Type I and Type II and high Tc superconductors, Applications: Magnets, Josephson effect, SQUID, Maglev, other.	07	18
6	**SEMICONDUCTORS** (Prerequisites: Intrinsic and extrinsic semiconductors, Energy bands in conductors, semiconductors and insulators, Semiconductor diode, I-V characteristics in forward and reverse bias) Direct & indirect band gap semiconductor; Classification of Conductors, Semiconductors and Insulators on the basis of energy band, Intrinsic & Extrinsic Semiconductors, Diodes, p-n junction (unbiased, forward bias, reverse bias); Applications of semiconductors: LED, Zener diode, Photovoltaic cell, Advantages of Semiconductror Devices, Transistors (working and characteristics)	09	18
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	To understand some basic aspects of the graph drawing.	04
2.	To understand some basic aspects of error analysis.	02
3.	To study the series and parallel connections of resistors.	02
4.	To study the series and parallel connections of capacitors.	04
5.	To study the energy band gap of semiconductor materials of a P-N junction of diode.	02
6.	To study the I-V characteristic of LED and dynamic resistance of a given LED.	02
7.	To study the I-V characteristic of ZENER diode and measurement of dynamic resistance.	02
8.	To determine the Numerical Aperture and acceptance angle of an optical fiber	04
9.	To determine wavelength of laser using diffraction grating.	04
10.	To determine the velocity of ultrasonic waves in a given liquid and also to determine the compressibility of the liquid.	04
	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
Engineering Physics	G Vijayakumari	Vikas Publishing house PVT LTD
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 Course Coordinator.
- End Semester Examination will consist of 60 marks.

Practical:

- Continuous Evaluation consists of Performance and regular manual writing, checking of the practical throughout the semester.
- Internal viva or practical performance consist of 20 Marks.
- Practical performance/test of 30 marks during End Semester Exam.
- Viva/Oral performance of 30 marks during End Semester Exam.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SESH1130	EXPERIMENTAL 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.
CO 3	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 4	Interpret the concept of Nanotechnology and understand the synthesis and applications of Nanomaterials from technological prospect. Discover the types and properties of Superconductors. Relate the behavior of superconductors at high temperatures
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

SESH1130	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	1	2	1	0	0	0	0	1	2
CO 2	2	3	2	3	2	1	1	0	1	1	2

CO 3	2	2	2	2	2	0	1	0	1	2	2
CO 4	3	2	2	2	1	1	2	1	1	1	3
CO 5	2	2	3	2	2	1	1	0	1	1	2

Mapping of CO with PSO

SESH1130	PSO1	PSO2	PSO3
CO 1		2	1
CO 2		2	1
CO 3		2	1
CO 4		3	2
CO 5		2	1

Level of Bloom's 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 Physics	2
2	Acoustic and Ultrasonic	3
3	Laser and Fibre Optics	2,3
4	Nanoscience and Nanotechnology	2,3,6
5	Superconductors and Supercapacitors	1, 2,3
6	Semiconductor Physics and Technology	1,6

P P Savani University
School of Engineering
Department of Science & Humanities

Course Code: SESH1120
Course Name: Linear Algebra
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	
03	-	02	05	40	60	-	-	100	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- Analyses and solve system of linear equations and understand characteristics of Matrices.
- 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.

Course Content:

Module No.	Content	Hours	Weightage in %
1	**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.	12	30
2	**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.	11	20
3	**Linear Transformation** Introduction of Linear Transformation, Kernal and Range, Rank and Nullity, Inverse of Linear Transformation, Rank Nullity Theorem, Composition of Linear Maps.	09	20
4	**Inner Product Space** Inner Product, Angle and Orthogonality, Orthogonal projection, Gram-Schmidt process and QR Decomposition, least square decomposition.	08	20
5	**Beta and Gamma function** Improper Integrals, Convergence, Properties of Beta and Gamma Function, Duplication Formula (without proof)	05	10
	TOTAL	45	100

List of Tutorial:

Sr. No.	Name of Tutorial	Hours
1.	Matrix Algebra-1	04
2.	Matrix Algebra-2	02

3.	Vector Space-1	04
4.	Vector Space-2	02
5.	Linear Transformation-1	04
6.	Linear Transformation-2	02
7.	Inner Product Space-1	04
8.	Inner Product Space-2	02
9.	Beta and Gamma function-1	04
10.	Beta and Gamma function-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 50 marks.
- Continuous Evaluation consists of self-performance assignment to 20 marks.
- Internal Viva consists of 30 marks.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SESH1120	**LINEAR ALGEBRA**
CO 1	Evaluate linear system using matrices and the knowledge of eigenvalues and eigenvectors for matrix diagonalization
CO 2	Determine the basis and dimension of vector spaces and subspaces.
CO 3	Discuss the matrix representation of a linear transformation given bases of the relevant vector space.
CO 4	Apply vectors, inner products, and linear transformations to real world situations.

CO 5	Classify gamma, beta functions & their relation which is helpful to evaluate some definite integral arising in various branch of engineering.

Mapping of CO with PO

SESH1120	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	3	1	1							3
CO 2	3	2	1								2
CO 3	2	2	1								3
CO 4	2	2	1	1							1
CO 5	2	1	1								1

Mapping of CO with PSO

SESH1120	PSO1	PSO2	PSO3
CO 1		3	1
CO 2		3	1
CO 3		2	1
CO 4		2	1
CO 5		2	1

Level of Bloom's Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1	Matrix Algebra	1, 2, 3, 4, 5, 6
2	Vector Space	1, 2, 3, 4, 6
3	Linear Transformation	1, 2, 3, 4, 6
4	Inner Product Space	1, 2, 3, 4, 5, 6
5	Beta and Gamma Function	1, 2, 3, 4, 5

P P Savani University
School of Engineering
Department of Civil Engineering

Course Code: SECV1210
Course Name: Basics of Civil 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	
3	0	2	5	40	60	00	00	40	60	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:
To help learners to

- Understand components of building, building terminology and construction materials.
- Understand building layout plan.
- Understand latest trends in civil engineering.
- Understand importance of various construction equipment.

Course Content:

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).	04	10
2.	**INTRODUCTION TO CIVIL ENGINEERING MATERIALS:** List of materials, Details (types, properties, uses) of materials: Cement, Aggregate, Brick, Steel, Concrete, Stone, Soil, Mortar, Timber, Plastic, Epoxy, Flyash, Steel slag, Copper slag, Bitumen, Optical fiber, Pipe, Wire, Cable, Smart material, Basic hand fill tests.	08	12
3.	**BUILDING CONSTRUCTION:** Types of building, Components of building, Type of foundation and importance, Types of brick bonds, Principle of planning, Typical building layout, Symbols used in electrical layout, Symbols used for water supply, plumbing and sanitation. Nominal dimensions for door, window and furniture	10	20
4.	**INTRODUCTION TO TOWN PLANNING:** 5Principles of town planning, Necessity of town planning, Origin of town, Growth of town, Land use, Principles and objects of zoning, Advantages of zoning, Low cost housing, Prevention of slum, FSI.	04	10
5.	**INTRODUCTION TO SURVEYING AND LEVELLING:** Introduction: Fundamental principles, Classification. Linear measurement: Instruments used, Chaining on plane ground, Offset, Ranging. Angular measurement: Compass-Instrument used, Meridian, Bearing, Local attraction. Levelling: Instrument used, Terminology, Types of leveling, Methods of leveling. Modern tools: Introduction to theodolite, Total Station, GPS.	10	20
6.	**CONSTRUCTION EQUIPMENT:**	04	10

	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.		
7.	**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.	05	10

List of Tutorial :

Sr. No	Name of Practical	Hours
1.	Unit conversation Exercise.	02
2.	Chart preparation of various materials.	02
3.	Different types of brick bonds.	04
4.	Layout of residential building.	02
5.	Introduction Linear and angular measurements	02
6.	Introduction to Theodolite	04
7.	Introduction to Dumpy level.	02
8.	Introduction to total station.	04
9.	Videosshowing working of construction Equipments.	04
10.	Presentation on various topics as in module 7 about recent trends.	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Elements of civil engineering	Anurag A. Kandya	Charotar Publication
Basic Civil Engineering	S. Ramamrutham	Dhanpatrai Publication

Reference Book(s):

Title	Author/s	Publication
Elements of civil engineering	Dr. R. K. Jain and Dr. P. P. Lodha	McGraw Hill Education
Basics of civil engineering	S.S. Bhavikatti	New age international Publishers

Web Material Links:

- http://nptel.ac.in/courses/105107122/
- http://nptel.ac.in/courses/105107157/
- http://nptel.ac.in/courses/105101087/
- 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 the Course Coordinator.
- End Semester Examination consists of 60 marks.

Tutorial:

- Continuous Evaluation consists of performance of practical which should be evaluated out of 10 marks for each practical and average of the same will be converted to 40 marks.
- External viva consists of 60 marks.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SECV1210	BASICS OF CIVIL ENGINEERING
CO 1	Explain the fundamental concepts of civil engineering, including its branches, scope, roles, and basic unit conversions.
CO 2	Identify and describe the properties, types, and applications of common civil engineering materials such as cement, concrete, steel, and aggregates.
CO 3	Illustrate and apply principles of building construction, including components, foundations, brick bonds, and building planning/layout.
CO 4	Demonstrate basic knowledge and applications of surveying and levelling techniques, including modern instruments like total station and GPS.
CO 5	Explain concepts of town planning, construction equipment, and recent trends in civil engineering such as smart cities, green buildings, and sustainable practices.

Mapping of CO with PO

SECV1210	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	2	3	2	3		2		3	
CO 2	3	3	3		2		2	3	3		3
CO 3	3	2	2	2	3	3		2	2	1	
CO 4	3	3		3		2	3		2	3	
CO 5	3		3	2	2	1	2	3			

Mapping of CO with PSO

SECV1210	PSO1	PSO2	PSO3
CO 1		2	1
CO 2		2	1
CO 3		3	2
CO 4		3	2
CO 5		3	2

Level of Bloom's 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 civil engineering materials	1, 2
3	Building construction	1, 2
4	Introduction to surveying and levelling	1, 2
5	Introduction to town planning	1, 2, 3
6	Construction equipment	1, 2
7	Recent trends in civil engineering	1, 2,4

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE1210
Course Name: Programming with C Essentials
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	
3	2	0	4	40	60	40	60	0	0	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:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Computers Programming:** Introduction to programs, its significance, classification of programming language, Selection of a programming language, Flow Charts and Algorithms.	04	10
2.	**Introduction to Constants, Variables and Data Types:** Features of C Language, the Structure of C Program, Types of Errors, Debugging, Tracing the Execution of the Program, Watching Variables Values in Memory. 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.	07	15
3.	**Operators, Expressions, and Managing I/O Operations:** 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.	05	10
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.	06	15
5.	**Arrays:** Introduction, One-dimensional Arrays, Two-dimensional Arrays, Concept of Multidimensional Arrays.	06	15
6.	**Strings:** Declaring and Initializing String Variables, Arithmetic Operations on Characters, Putting Strings Together, Comparison of Two Strings, String Handling Functions.	05	12
7.	**User-Defined Functions:** Concepts of User-defined Functions, Prototypes, function Definition,	06	13

	Parameters, Parameter Passing, Calling a Function, Recursive Function.		
8.	**Pointers:** Introduction to Pointers, Declaration and initialization of pointers, Pointer to pointer, pointer and array, pointer to array, array to pointer, function returning pointer.	06	10
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Draw Flow Chart and write algorithm for at least five problems.	02
2.	Introduction to C programming environment, compiler, Linker, loader, and editor.	02
3.	Write programs to implement basic elements of C programming (different input functions, different output functions, different data types, and different operators)	04
4.	Write programs to implement control structures (if statement, if-else statement, nested if-else statement, switch statement, break statement, goto statement)	04
5.	Write programs to implement looping constructs (for loop, while loop, do-while and nested for loop)	04
6.	Write programs to implement arrays. (1-D array, and 2-D array)	04
7.	Write programs to implement strings. (input, output, different string inbuilt functions)	02
8.	Write programs to implement user-defined functions. (function with/without return type, function with/without argument, function and array)	04
9.	Write programs to implement recursive function.	02
10.	Write programs to implement pointers.	02
	TOTAL	30

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

SECE1210	PROGRAMMING WITH C ESSENTIALS
CO 1	Observe and interpret 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.
CO 5	Develop and utilize user-defined functions, arrays, strings and pointers in C for efficient data manipulation and code modularity.

Mapping of CO with PO

SECE1210	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11
CO 1	3	2	1							1	
CO 2	3	3	2	1	2					1	
CO 3	2	3	2	1	2		2				2
CO 4	2	3	1	2	1			2			
CO 5	3	3	3	2	3	2	2	2	1	1	2

Mapping of CO with PSO

SECE1210	PSO1	PSO2	PSO3
CO 1	2	1	1
CO 2	3	2	1
CO 3	3	2	1
CO 4	2	2	1
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 to Computers Programming:	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	2,3,5
6.	Strings	2,3
7.	User-Defined Functions	2,3,4,6
8.	Pointers	2,3,4,5

P P Savani University
School of Engineering

Department of Electronics & Communication

Course Code: SEEC1210
Course Name: Basics of Electrical and Electronics
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Understand fundamental concepts of electrical related to Voltage, Current etc. and principles of circuit analysis.
- Explore electrical components, learn measurement and instrumentation along with elementary understanding of electronics.

Course Content:

Module No.	Content	Hours	Weightage in %
1	**Basic Introduction to Electricity and Magnetism** Concept of Charge, Coulomb's law, Electric Field, Intensity of electric field, Electric lines of force, Properties of electric lines of force, Electric flux, Flux density, Potential Difference and Current, Concept of Magnetic field, Coulomb's law of magnetic force, Magnetic Lines of Force, Magnetic flux.	11	24
2	**DC Circuits and Electromagnetism** Electrical circuit elements (R, L and C): Resistor, capacitor, Inductor, Voltage and Current sources, Ohm's law, effect of Temperature on resistance, temperature coefficient, Series and parallel combinations of Resistors and capacitors, Kirchoff's current and voltage laws, Thevenin and Norton Theorems. Ampere's law, Lenz and Faraday's laws for electromagnetic induction, Self inductance, Mutual inductance. Examples	12	26
3	**AC Circuits** Representation of sinusoidal waveforms, peak and RMS values, Phasor representation of AC quantities, real power, reactive power, apparent power, power factor, Three phase balanced circuits, voltage and current relations in star and delta connections, Power measurement in three phase circuits. Examples	11	25
4	**Electronics** Classification of Solids: Energy levels in solids, Semiconductors, Intrinsic and Extrinsic Semiconductor, N-type & P-type semiconductors, P-N junction diode, Characteristics of P-N junction diode, Types of Diodes: Photo diode, Light Emitting Diode, Solar cell, PIN diode, Varactor diode, Zener diode, Advantages of Semiconductor Devices.	11	25

	Total	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	To understand various electronic devices/components.	04
2.	To understand various tools (devices and equipments) used in electrical and electronic circuits for measurements.	04
3.	To study cathode ray oscilloscope and to understand how to take measurement, time period and frequency.	02
4.	To verify ohm's law using ammeter and voltmeter.	02
5.	To study the series and parallel connections of resistors.	04
6.	To study the series and parallel connections of capacitors.	04
7.	To verify Kirchoff's Current and Voltage Law.	02
8.	To study I-V characteristics of Light Emitting diode (LED).	02
9.	To study I-V characteristics of Zener diode.	02
10.	To understand Faraday's law of electromagnetic induction.	04
	Total	**30**

Text Book(s):

Title	Author/s	Publication
Basic electrical engineering	T.N. Nagsarkar and M.S. Sukhija	Oxford University Press, 3rd edition.
Basic electrical engineering	D.P. Kothari and I.J. Nagrath	Tata McGraw-Hill Education, 2010
Fundamentals of Electrical Engineering	L. S. Bobrow	Oxford University Press, 2011
Electronic Principles	Albert Malvino & David J. Bates	McGraw-Hill Education, 7th edition.
Electronic Devices and Circuits	David A. Bell	Oxford University Press, 5th edition

Web Material Link(s):

- https://archive.nptel.ac.in/courses/108/105/108105112/
- https://archive.nptel.ac.in/courses/108/101/108101091/

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 and regular manual writing, checking of the practical throughout the semester consists 20 Marks.
- Internal viva or practical performance consist of 20 Marks.
- Practical performance/test 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 students will be able to

SEEC1210	BASICS OF ELECTRICAL AND ELECTRONICS
CO 1	Apply fundamental electrical laws (Ohm's Law, KCL, KVL) to analyze basic electrical circuits with resistors, capacitors, inductors, and sources.
CO 2	Analyze and solve electrical circuits using network theorems such as Thevenin's, Norton's, Superposition, and apply node and mesh analysis techniques.
CO 3	Evaluate the performance of AC and DC circuits by analyzing power components, power factor, transient and steady-state behavior of RLC circuits.
CO 4	Explain the working principles and applications of semiconductor devices including PN junction diode, rectifiers, BJT, JFET, and MOSFET.
CO5	Design and analyze basic digital circuits using number systems, logic gates, Boolean algebra, combinational and sequential circuits.

Mapping of CO with PO

SEEC1210	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	PO11
CO 1	3	2	1								
CO 2	3	3	2	1							
CO 3	3	2	1	1							
CO 4	2	1	1								
CO 5	3	2	3	1	1				1		

Mapping of CO with PSO

SEEC1210	PSO1	PSO2	PSO3
CO 1		2	1
CO 2		3	1
CO 3		2	1
CO 4		2	1
CO 5	1	2	2

Level of Bloom's Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1	Basic Introduction to Electricity and Magnetism	1,2
2	DC Circuits and Electromagnetism	2,3,4,5
3	AC Circuits	2,3,4,5
4	Electronics	3,4,5

P P Savani University
School of Engineering

Department of Mechanical Engineering

Course Code: SEME1220
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	-	02	-	-	100	-	-	-	100

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 and average of the same will be converted to 50 Marks.
- Internal Viva consists of 50 Marks.

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

SEME1220	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

SEME1220	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	2					2			2		1
CO 2						3		3	3		1
CO 3	2					2			1		1
CO 4	2								3		2
CO 5	2								3		2

Mapping of CO with PSO

SEME1220	PSO1	PSO2	PSO3
CO 1		1	2
CO 2		1	2
CO 3		2	3
CO 4		1	3
CO 5		2	3

Level of Bloom's 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 and Demonstration of Safety Norms. Different Measuring	1, 2, 4
2	Instruments.	1, 2, 3
3	To Perform a Job of Fitting Shop.	1, 2, 3
4	To Perform a Job of Carpentry Shop.	2, 3, 4
5	To Perform a Job of Sheet Metal Shop.	2, 3, 4
6	To Perform a Job of Black Smithy Shop.	2, 3, 4
7	Introduction and Demonstration of Grinding & Hacksaw Cutting Machine.	2, 3, 4

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE1220
Course Name: Digital Proficiency
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	
3	0	0	3	40	60	0	0	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- provide foundational knowledge of digital tools and technologies.
- introduce the principles of digital communication, collaboration, and problem-solving.
- enhance awareness of emerging digital trends and their applications in engineering.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Digital Literacy** Overview of digital tools and their applications, Introduction to operating systems (Windows, Linux), Basics of file management and cloud storage solutions, Digital communication tools: Email, messaging platforms, and video conferencing tools (Zoom, Teams).	06	13
2.	**Office Productivity Tools** Word Processing: Document formatting, templates, and styles (MS Word/Google Docs). Presentation Tools: Slide design, animations (MS PowerPoint/Google Slides).	04	10
3.	**Data Handling and Analysis** Spreadsheets: Data entry, formulas, charts, pivot tables (MS Excel/Google Sheets). Introduction to data visualization tools (e.g., Tableau, Power BI, Google Data Studio). Applications of data analysis in engineering contexts. AI features in Excel and Google Sheets for predictive analysis.	07	15
4.	**Computational Problem-Solving** Introduction to algorithms and flowcharts. Solving simple engineering problems through programming. Applications of computational techniques in various engineering domains.	06	12
5.	**Cybersecurity and Ethical Practices** Understanding cybersecurity principles, Awareness of phishing, malware, and secure passwords, Digital footprints and privacy concerns, Ethical use of technology and copyright considerations.	05	12
6.	**Introduction to AI Tools and Applications** Overview of AI, Machine Learning, and their applications in engineering. Practical use of AI tools: ChatGPT for content creation and brainstorming, Canva for design and visual communication, GitHub Copilot for coding assistance. Ethical considerations in AI usage.	07	15
7.	**Emerging Technologies and Industry Trends** Overview of Industry 4.0 concepts: IoT, AI, Robotics, and Blockchain.	07	15

	Applications of emerging technologies in various engineering domains. Case studies: Smart cities, sustainable manufacturing, and automation. Preparing for future technological trends and job roles.		
8.	**Capstone Project and Case Study** Group project: Solve a practical engineering problem using digital tools. Case study presentations on the application of digital and AI tools in real-world scenarios.	03	08
	TOTAL	45	100

Text Book(s):

Title	Author/s	Publication
Digital Literacy for Dummies	Faithe Wempen	Wiley
Literacy in a Digital World: The Evolution and Development of Literacy Proficiency	Lorraine Dagostino, Jennifer Bauer, Michael Deasy, Ed.D., Kathleen Ryan	Rowman & Littlefield

Reference Book(s):

Title	Author(s)	Publication
Computer Fundamentals	P.K. Sinha and Priti Sinha	BPB Publications- 6th Edition
Microsoft Office 365: In Practice	Randy Nordell and Annette Easton	McGraw Hill Education- Latest Edition
Ethics for the Information Age	Michael J. Quinn	Pearson Education- 8th Edition
Industry 4.0: Managing the Digital Transformation	Alp Ustundag and Emre Cevikcan	Springer

Web Material Link(s):

- https://learn.microsoft.com/en-us/training/browse/
- https://www.ibm.com/think/topics/cybersecurity
- https://www.youtube.com/playlist?list=PLlKpQrBME6xLGL3Ty_1Wbd3nTZ_q_OKFQ

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.

Course Outcome(s):

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

SECE1220	Digital Proficiency
CO 1	Demonstrate proficiency in using digital tools, operating systems, and cloud platforms for effective communication and collaboration.
CO 2	Create, edit, and manage professional documents, presentations, and spreadsheets using modern office productivity software.
CO 3	Analyze and visualize data using advanced spreadsheet features and data visualization tools to solve engineering problems.
CO 4	Identify cybersecurity risks, implement ethical practices, and safeguard digital assets in professional environments.
CO 5	Apply AI tools and understand emerging technologies like IoT and blockchain to address real-world engineering challenges.

Mapping of CO with PO

SECE1220	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11
CO 1	3	3		1	3			2	3		1
CO 2	3	2			3				3		1
CO 3	3	2	1	3	3						1
CO 4	3	2			3		3				1
CO 5	3	3	1		3						1

Mapping of CO with PSO

SECE1220	PSO1	PSO2	PSO3
CO 1	1	2	2
CO 2	2	2	2
CO 3	2	3	2
CO 4	1	2	2
CO 5	2	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 Digital Literacy	1,2,3
2.	Office Productivity Tools	2,3,4
3.	Data Handling and Analysis	2,3,4,5
4.	Computational Problem-Solving	2,3
5.	Cybersecurity and Ethical Practices	1,2,3
6.	Introduction to AI Tools and Applications	1,2,3,5
7.	Emerging Technologies and Industry Trends	3,4,5
8.	Capstone Project and Case Study	2,3,5,6

SECOND YEAR B. TECH.

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

TEACHING & EXAMINATION SCHEME FOR SECOND YEAR B.TECH. COMPUTER SCIENCE & ENGINEERING PROGRAMME AY: 2025-26

Sem	Course Code	Course Title	Course Category	Offered By	Teaching Scheme					Examination Scheme						
					Contact Hours				Credit	Theory		Practical		Tutorial		Total
					Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
3	SESH2150	Discrete Structures & Graph Theory	Interdisciplinary	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SECE2280	Database Management System	Major/Core	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SECE2291	Data Structures	Major/Core	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SEIT2250	Object Oriented Programming with Java	Major/Core	IT	3	2	0	5	4	40	60	40	60	0	0	200
	SECE2250	Computer Organization & Architecture	Major/Core	IT	3	2	0	5	4	40	60	40	60	0	0	200
	CFLS2140	Upper Intermediate Communicative English	AEC	CFLS	2	0	0	2	2	100	0	0	0	0	0	100
	CLSC2020	IPDC-I	VAC	CLSC	2	0	0	2	2	100	0	0	0	0	0	100
							Total	**29**	**25**							**1200**
4	SECE2260	Design & Analysis of Algorithms	Interdisciplinary	SH	3	2	0	5	4	40	60	40	60	0	0	200
	SECE2270	Embedded Systems	Major/Core	CE	2	2	0	4	3	40	60	40	60	0	0	200
	SECE2310	Computer Networks	Major/Core	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SEIT2260	Operating System	Major/Core	IT	3	2	0	5	4	40	60	40	60	0	0	200
	SEIT2500	MOOC Course-I	Major/Core	IT	3	0	0	3	3	100	0	0	0	0	0	100
	CLSC2030	IPDC-II	VAC	CLSC	2	0	0	2	2	100	0	0	0	0	0	100
							Total	**24**	**20**							**1000**

P P Savani University
School of Engineering

Department of Science & Humanities

Course Code: SESH2150
Course Name: Discrete Structures & Graph Theory
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	--	--	100	--	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- extend concepts of set theory by the study of relation and lattice.
- illustrate mathematical logic with various techniques of program verification.
- apply knowledge of discrete mathematics for problem-solving skills necessary to succeed in the design and analysis of algorithms, database management, software engineering, and computer networks.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Set, Relation & Function-I** Sets, Set operations, Introduction of Relations, Relations of Sets, Types of Relations, Properties of Relations, Equivalence Relation.	04	10
2.	**Set, Relation & Function-II** Partial Ordering, Hasse Diagram, GLB & LUB, Functions, Classification of functions, Types of functions	04	07
3.	**Lattices** Definition & properties of Lattice, Lattices as Algebraic System, Sublattices, Types of lattices, Distributive lattices, Modular lattices, Complemented lattices, Bounded lattices, Complete lattices, Finite Boolean algebra	07	16
4.	**Group Theory-I** Binary operations, Properties of Group, Groupoid, semigroup & monoid, Abelian group, Subgroup.	04	10
5.	**Group Theory-II** Cosets, Normal subgroup, Lagrange's theorem, Cyclic group, Permutation group, Homomorphism & Isomorphism of groups.	04	07
6.	**Mathematical Logic and Proof** Propositions, logical operators, Algebra of proposition, Predicates & quantifiers, Nested Quantifiers, Rules of Inference, Proof Methods, Program Correctness techniques.	06	14
7.	**Graph Theory** Graphs and Graph Models, Graph Terminology and Types of graphs, Representing graphs and Isomorphism, Connectivity, Euler and Hamilton Paths-Circuits, Applications of weighted graphs.	08	18

8.	**Tree** Introduction to Trees, Rooted Tree, Properties of tree, Binary tree, Tree Traversal, Spanning Tree, DFS, BFS, Minimum Spanning Tree, Prim's Algorithm, Kruskal's Algorithm.	08	18
	TOTAL	45	100

List of Tutorial(s):

Sr. No.	Name of Practical	Hours
1.	Problems based on Set, Relation & Function-1	2
2.	Problems based on Set, Relation & Funciton-2	2
3.	Problems based on Set, Relation & Funciton-3	2
4.	Problems based on Lattices	4
5.	Problems based on Group Theory-1	4
6.	Problems based on Group Theory-2	4
7.	Problems based on Mathematical Logic and Proof	4
8.	Problems based on Graph Theory-1	4
9.	Problems based on Graph Theory-2	2
10.	Problems based on Tree	2
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Discrete Mathematics and its Applications	Kenneth Rosen	McGraw Hill, New York.

Reference Book(s):

Title	Author(s)	Publication
A Textbook of Discrete Mathematics	Dr. Swapan Kumar Sarkar	S. Chand & Company Ltd., New Delhi.
Discrete Mathematical Structure with Applications to Computer Science	J.P.Trembly, R. Manohar	Tata McGraw-Hill Publishing Company Ltd. New Delhi.
Graph Theory with Applications to Engineering and Computer Science	Narsingh Deo	PHI Learning Pvt. Ltd. New Delhi.

Web Material Link(s):

- http://nptel.ac.in/courses/111107058/
- http://nptel.ac.in/courses/111104026/

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 the performance of tutorial which will be evaluated out of 10 marks for each tutorial and average of the same will be converted to 100 marks.

Course Outcome(s):

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

SESH2150	**DISCRETE STRUCTURES & GRAPH THEORY**
CO 1	Summarize the concepts of set theory for understanding & fetching data from a database using query.
CO 2	Construct the algorithm of group theory for data encryption.
CO 3	Combine the design, foundational concepts of notations and results of graph theory used for better understanding of problems.
CO 4	Develop an algorithm using Asymptotic analysis
CO 5	Classify the basic concepts of spanning tree algorithms namely dfa, bfs, prim's and kruskal's in the design of networks.

Mapping of CO with PO

SESH2150	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11
CO 1	2	2	1	1							1
CO 2	2	2	1	1							1
CO 3	3	3	1	1							3
CO 4	2	2	1	1							2
CO 5	3	3	1	1							3

Mapping of CO with PSO

SESH2150	PSO1	PSO2	PSO3
CO 1	2	2	0
CO 2	2	2	0
CO 3	3	2	2
CO 4	2	2	0
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.	Set, Relation & Function-I	1,2,4,6
2.	Set, Relation & Function-II	1,2,4,6
3.	Lattices	1,2,3,4,6

4.	Group Theory-I	1,2,3,5,6
5.	Group Theory-II	1,2,3,5,6
6.	Mathematical Logic and Proof	1,2,3,4,6
7.	Graph Theory	1,2,3,5,6
8.	Tree	1,2,3,5,6

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE2280
Course Name: Database Management System
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	--	04	40	60	40	60	--	--	200

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:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to DBMS** Introduction and applications of DBMS, Purpose of DBMS, File system versus DBMS, Advantages of DBMS, Database System architecture, Database users, DBA	04	10
2.	**Entity-Relationship model** Basic concepts, Design process: Attributes, Entity and Relationship, E-R constraints, weak entity sets, extended E-R features: generalization, specialization, aggregation, conversion of E-R diagram into database schema.	07	15
3.	**SQL Concepts-I** Basics of SQL, Types of SQL language, Using DDL statements to create and manage tables, defining constraints: primary key, foreign key, unique key, Not null, check, manipulating data using DML statements, retrieving data using SQL select statement, SQL conditions in where clause.	6	13
4.	**SQL Concepts-II** SQLBuilt-in functions: numeric, date, string functions, displaying data from multiple tables using Joins, Aggregate functions with group by and having clause, Subqueries with operators, SQL views, TCL commands: Commit, Rollback, Savepoint, DCL commands: Grant, revoke, query processing steps.	6	12
5.	**Relational Model** Structure of relational databases, Domains, Relations, Relational algebra: fundamental operators and syntax, inner join, outer join, relational algebra queries	05	12
6.	**Normalization** Functional Dependency: Definition, trivial and non-trivial FD, closure of attributes, closure of FD set, irreducible set of FD, Decomposition using FD, dependency preservation, Database design anomalies,	07	15

	Normalization: 1NF, 2NF, 3NF, BCNF, Multi- valued dependency, 4NF.		
7.	**Transaction Management** Transaction concepts, ACID property of transactions, concurrent executions of transactions and related problems, serializability of transactions, testing for serializability, deadlock, solution to concurrency related problems: Locking mechanism, two-phase locking protocol, System recovery, Log-based recovery, Two- phase commit protocol	07	15
8.	**Basics of PL/SQL** Programming structure of PL/SQL, Datatypes, Exception Handling, Cursor, Stored Procedure, Function, Trigger	03	08
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Draw E-R Diagram of any management system with the use of any tools.	02
2.	Installation of database management system e.g MYSQL, ORACLE, etc.	02
3.	Introduction to SQL, DDL, DML, DCL, database and table creation, alteration, defining constraints, primary key, foreign key, unique, not null, check.	06
4.	Implement different operators and inbuilt SQL functions.	02
5.	Implement different types of join operations and relevant features of SQL.	04
6.	Implement aggregate functions with group by, having, order by features of SQL.	04
7.	Implement the sub-queries and views in SQL.	04
8.	Study and use of Transaction control commands, Commit, Rollback, Save point features of SQL.	02
9.	Introduction to PL/SQL concepts and implementation of Cursors.	02
10.	Study and Implementation of stored procedures, stored function and triggers.	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
Fundamental of Database system	R. Elmasri and S.B Navathe	The Benjamin/Cumming
Oracle: The Complete Reference	George Koch, Kevin Loney	TMH /Oracle Press
An Introduction to Database system	C J Date	Addition-Wesley

Web Material Link(s):

- https://nptel.ac.in/courses/106105175
- https://www.youtube.com/watch?v=c5HAwKX-suM

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 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.
- Viva-voce consists of 30 marks.

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

SECE2280	DATABASE MANAGEMENT SYSTEM
CO1	Understand the importance of back-end design and relational database management system.
CO2	Apply physical data, conceptual data and its conversion into relational databases.
CO3	Practice various database constraints on relational databases.
CO4	Design and develop database for the software projects.
CO5	Implement PL/SQL programs using cursors, procedures, functions, and triggers to manage transactions effectively.

Mapping of CO with PO

SECE2280	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	3	2		2					1	
CO 2	3	3	2		2						
CO 3	3	3	2		2					1	
CO 4	3	3	3	2	3					2	2
CO 5	3	2	3	2	3				2	2	2

Mapping of CO with PSO:

SECE2280	PSO1	PSO2	PSO3
CO 1	**3**	**2**	**1**
CO 2	**3**	**3**	**2**
CO 3	**3**	**3**	**2**
CO 4	**3**	**3**	**1**
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 to DBMS	1,2
2.	Entity-Relationship model	1,2,3
3.	SQL Concepts-I	4,6
4.	SQL Concepts-II	4,6
5.	Relational Model	3,4

6.	Normalization	2,3
7.	Transaction Management	2,3,4
8.	Basic of PL/SQL	2,4,6

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE2291
Course Name: Data Structures
Prerequisite Course(s): Programming with C Essentials (SECE1210)

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	40	60	--	--	200

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.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Data Structures** Basic Terminology, Classification of Data Structures: Primitive and Non-Primitive, Linear and Non-linear, Operations on Data Structures.	04	10
2.	**Array** Array Representation, Array as an Abstract Data Type, Programming Array in C, Sparse Matrices, Sparse Representations, and its Advantages, Row-measure Order and Column-measure Order representation.	04	10
3.	**Searching and Sorting** Linear Search, Binary Search, Bubble Sort, Insertion Sort, Selection Sort, Radix sort.	04	10
4.	**Stack and Queue** Stack Definition and concepts, Operations on stack, Programming Stack using Array in C, Prefix and Postfix Notations and their Compilation, Recursion, Tower of Hanoi, Representation of Queue, Operation on Queue, Programming Queue using Array in C. Types of Queue, Applications of Stack & Queue.	07	15
5.	**Linked List-Part I** Dynamic Memory Allocation, Structure in C, Singly Linked List, Doubly Linked List, circular linked list.	04	10
6.	**Linked List-II and Applications of Linked List** Linked implementation of Stack, Linked implementation of Queue, Applications of Linked List.	03	08
7.	**Trees and Graphs** Tree Definition, concepts, and Representation, Binary Tree, Binary Tree Traversals, conversion from general to Binary Tree. Threaded Binary Tree, Heap, Binary Search Tree. Tree for Huffman coding, AVL Trees. 2-3 Trees Graph Definition, Concepts, and Representation, Types of Graphs, Breadth First Search, Depth First Search, Spanning Tree, Kruskal's and	15	28

	Prim's Minimum Cost Spanning Tree Algorithms, Dijkstra's Shortest Path Algorithm.		
8.	**Hashing** The Symbol Table Abstract Data Types, Hash Tables, Hashing Functions, Hash collision Resolution Technique, Linear Probing.	04	10
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Working with the array. • Write a program to read numbers and store it in array and display it. • Write a program to demonstrate the concept of one-dimensional array • Write a program to insert an element in array. • Write a program to delete an element from an array. • Write a program to add two matrix A and B. • Write a program to concatenate two strings.	04
2.	Write a program to perform Linear Search.	02
3.	Write a program to perform Binary Search.	02
4.	Write a program to perform Bubble sort.	02
5.	Write a program to perform Selection sort.	02
6.	Write a program to perform Insertion sort.	02
7.	Write a program to implement a stack and perform push, pop operation.	02
8.	Write a program to perform the following operations in a linear queue –Addition, Deletion, and Traversing.	02
9.	Write a program to perform the following operations in singly linked list – Creation, Insertion, and Deletion.	04
10.	Write a program to create a binary tree and perform – Insertion, Deletion, and Traversal.	04
11.	Write a program for traversal of graph (B.F.S., D.F.S.).	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

Reference Book(s):

Title	Author(s)	Publication
Data Structures using C & C++	Tanenbaum	Prentice-Hall
Fundamentals of Computer Algorithms	E. Horowitz, S. Sahni, and S. Rajsekaran	Galgotia Publication
Data Structures: A Pseudo-code approach with C	Gilberg & Forouzan	Thomson Learning

Web Material Link(s):
https://nptel.ac.in/courses/106102064/

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

SECE2291	DATA STRUCTURES
CO 1	Explain and differentiate various data structures, their classifications, and operations for organizing and processing data efficiently.
CO 2	Implement linear data structures such as arrays, stacks, and queues to solve real-world computational problems
CO 3	Apply and analyze dynamic data structures like linked lists, trees, and graphs for efficient data manipulation and traversal.
CO 4	Evaluate and compare the performance of various searching, sorting, and hashing techniques in terms of time and space complexity.
CO 5	Design appropriate data structure-based solutions for specific problems using suitable algorithms and justify the chosen approach.

Mapping of CO with PO

SECE2291	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2									1
CO 2	3	3	2		3			1			
CO 3	3	3	2	2	3			1			
CO 4	3	3		3	3						
CO 5	2	3	3	2	3			2	1	1	3

Mapping of CO with PSO:

SECE2291	PSO1	PSO2	PSO3
CO 1	3	2	
CO 2	3	3	2
CO 3	3	3	1
CO 4	2	3	2
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 to Data Structures	1,2,3
2.	Array	1,2,3,4
3.	Searching and Sorting	1,2,3,4,5
4.	Stack and Queue	1,2,3,4,5
5.	Linked List-Part I	1,2,3,4
6.	Linked List-II and Applications of Linked List	2,3,4,5
7.	Trees and Graphs	1,2,3,4,5,6
8.	Hashing	1,2,3,4,5

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT2250
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	
3	2	0	4	40	60	40	60	0	0	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Understand the fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
- Understand the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- Be aware of the important topics and principles of object-oriented software development.
- Be able to use the Java SDK environment to create, debug and run core Java programs.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Fundamental of Object-Oriented Programming:** History of Java, Basic overview of java, Bytecode, JVM, Buzz- words, Application and applets, Constants, Variables, Data Types, Comments, Operators, Control Flow	04	10
2.	**Class Fundamentals:** General form of class, creating class Overloading methods, Constructor, Declaring Object, Returning objects, using objects as parameters, assigning object reference variables, Introducing Access control, understanding static, introducing final, the finalize () method, This keyword, Garbage collection.	06	15
3.	**Array & String Handling:** Array basics, String Array, String class, String Buffer class, String Tokenizer Class and Object Class.	06	10
4.	**Inheritance, Interfaces & Packages:** Inheritance: Using super creating multilevel Hierarchy, method overriding, Dynamic method dispatch, abstract classes, using final with Inheritance, Using Package: Defining package, finding package and CLASSPATH, Access protection, importing package, Interface: Defining Interface, Implementing Interface, Variables in Interface.	06	15
5.	**Exceptions Handling:**	06	15

	Exception types, Try…Catch…Finally, Throw, Throws, creating your own exception subclasses.		
6.	**Multithreaded Programming:** Life cycle of thread, thread methods, thread priority, thread exceptions, Implementing Runnable interface, Synchronization.	06	15
7.	**GUI Programming** Swing overview, Swing component classes: AbstractButton, ButtonGroup, ImageIcon, JApplet, Jbutton, JcheckBox, JcomboBox, Jlabel, JradioButton, JscrollPane, JtabbedPane, Jtable, JtextField, Jtree. Event Handling.	06	10
8.	**JDBC** Introduction to java database programming, JDBC driver types, Steps to connect JDBC, JDBC statement interface, JDBC prepared statement interface, JDBC callable statement interface	05	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	02
3.	Implementation of Java programs to create functions, constructors with overloading and overriding	02
4.	Implementation of Java programs to demonstrate different access specifiers	02
5.	Implementation of Java programs for variables, data types, operators	02
6.	Implementation of Java programs to use arrays and string	02
7.	Implementation of Java programs for inheritance (single, multilevel, hierarchical)	02
8.	Implementation of Java programs to demonstrate the use of super keyword	02
9.	Implementation of Java programs for Interface	02
10.	Implementation of Java programs to demonstrate Java packages	02
11.	Implementation of Java programs for exception handling using all keywords (try, catch, throw, throws and finally)	02
12.	Implementation of Java programs to demonstrate the life cycle of thread	02
13.	Implementation of Java programs for the concepts of thread priority, synchronization, inter-thread communication	02
14.	Implementation of Java Swing programs to Create Registration Form	02
15.	Implement Java Database Connectivity using JDBC.	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Java The Complete Reference	Herbert Schildt	McGraw Hill 13th Edition Jan 11, 2024

Reference Book(s):

Title	Author(s)	Publication
Core Java Volume I - Fundamentals	Cay Horstmann and Gray Cornell	Pearson
Thinking in Java	Bruce Eckel	Pearson

Learning Java	Patrick Niemeyer & Jonathan Knudsen	O'Reilly Media

Web Material Link(s):

- **https://docs.oracle.com/javase/tutorial/tutorialLearningPaths.html**
- **http://openjdk.java.net/projects/jigsaw/**
- **https://docs.oracle.com/en/java/javase/14/docs/api/index.html**
- **https://netbeans.apache.org/download/index.html**
- **https://download.eclipse.org/eclipse/downloads/**

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

SEIT2250	**Object Oriented Programming with Java**
CO 1	Implement Object Oriented programming concept using basic syntaxes of control Structures, strings, and function for developing skills of logic building activity.
CO 2	Use of a variety of basic control structures including selection and repetition; classes and objects in a tiered architecture (user interface, controller, and application logic layers)
CO 3	Demonstrates how to achieve reusability using inheritance, interfaces, and packages and describes faster application development that can be achieved.
CO 4	Demonstrate understanding and use of different exception handling mechanisms and concepts of multithreading for robust faster and efficient application development.
CO 5	Identify and describe common abstract user interface components to design GUI in Java using Swing along with a response to events. Identify, Design & develop complex Graphical user interfaces using principal Java Swing classes based on MVC architecture

Mapping of CO with PO

SEIT2250	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	2	3	3								
CO 2	3	2	3	2	1	1					
CO 3		2	2	3	2						1
CO 4	1	1	1	1	3						2
CO 5	1	1	1	2	3	1		1			2

Mapping of CO with PSO

SEIT2250	PSO1	PSO2	PSO3
CO 1	3	2	1
CO 2	3	3	1
CO 3	3	3	1
CO 4	3	2	2
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.	Fundamental of Object-Oriented Programming	1,2
2.	Class Fundamentals	1,2,3
3.	Array & String Handling	3,4,5
4.	Inheritance, Interfaces & Packages	2,3,4,5
5.	Exceptions Handling	2,3,5
6.	Multithreaded Programming	2,3,4,6
7.	GUI Programming	2,3,4,5,6
8.	JDBC	3,4,5,6

P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE2250
Course Name: Computer Organization & Architecture
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	05	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- To understand the fundamental structure, components, and functioning of computer systems.
- To develop skills in low-level programming, instruction execution, and system control.
- To analyze the design and performance of CPU, memory, and I/O organizations.
- To evaluate and apply advanced concepts like pipelining, parallel processing, and multiprocessor architectures.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Basic Computer Organization and Architecture** Definition of Computer Organization and Computer Architecture. Data Representation: Decimal, Binary, Octal and Hexadecimal numbers, Instruction codes, Computer registers, Computer Instructions, Timing and Control, Instruction cycle Memory-Reference Instructions, Input-output and interrupt, Design of Accumulator Unit.	06	15
2.	**Programming the Basic Computer** Introduction Machine Language, Assembly Language, Assembler, Program loops, Programming Arithmetic and logic operations, subroutines, I-O Programming.	05	08
3.	**Computer Arithmetic** Introduction, Addition and subtraction, Multiplication and Division Algorithms, Floating Point Arithmetic.	06	12
4.	**Central Processing Unit** Introduction, General Register Organization, Stack Organization, Instruction format, Addressing Modes, data transfer and manipulation, Program Control, Reduced Instruction Set Computer (RISC).	06	15
5.	**Pipeline Control and Parallel Processing** Flynn's taxonomy, Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction, Pipeline Hazards, Pipeline Performance, RISC Pipeline.	05	10
6.	**Input-Output Organization** Types of Peripherals, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA	05	10

7.	**Memory Organization** Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory.	06	15
8.	**Multi-Processors** Introduction, Characteristics of multiprocessors, interconnection structures, inter processor arbitration, inter processor communication and synchronization, shared memory multiprocessors.	06	15
	TOTAL	45	100%

List of Practical:

Sr. No	Name of Practical	Hours
1	Study and implement programs on number system	08
2	Study and implement programs on conversion	04
3	Study and build different logic gates using Logisim.	04
4	Study and build different circuits using Logisim.	10
5	Study the pipeline and vector processing and multiprocessors.	04
	TOTAL	30

Text Book (s):

Title	Author/s	Publication
Computer System Architecture	M. Morris Mano	Pearson

Reference Book (s):

Title	Author/s	Publication
Computer Organization and Architecture: Designing for Performance	W. Stallings	Pearson
Computer Architecture and Organization	J.P. Hayes	McGraw Hill

Web Material Link(s):

- https://nptel.ac.in/courses/106106092/

Course Evaluation:

Theory:

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

Practical:

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

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SECE2250	COMPUTER ORGANIZATION & ARCHITECTURE
CO 1	Explain the fundamental concepts of computer organization including data representation, instruction execution, and the design of basic computer systems.
CO 2	Develop and analyze assembly and machine-level programs for arithmetic, logic, and I/O operations in a basic computer system.

CO 3	Illustrate and compare various arithmetic algorithms and CPU organization techniques including addressing modes, instruction formats, and RISC architecture.
CO 4	Evaluate the design and performance of pipelining, parallel processing, and I/O organization techniques in modern processors.
CO 5	Design and assess efficient memory and multiprocessor architectures ensuring synchronization and inter-processor communication.

Mapping of CO with PO

SECE2250	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	1	1	1					1	2
CO2	3	3	2	2	2					1	2
CO3	3	3	2	2	1					2	2
CO4	3	3	2	3	2	1				2	2
CO5	3	3	3	3	2	1				2	3

Mapping of CO with PSO

SECE2250	PSO1	PSO2	PSO3
CO 1	2	2	1
CO 2	3	3	2
CO 3	3	3	2
CO 4	2	3	2
CO 5	2	3	2

Level of Bloom's Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1	Basic Computer Organization and Design	1,2
2	Programming the Basic Computer	3
3	Computer Arithmetic	4
4	Central Processing Unit	4
5	Pipeline Control and Parallel Processing	5
6	Input-Output Organization	5
7	Memory Organization	6
8	Multi-Processors	6

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE2260
Course Name: Design & Analysis of Algorithms
Prerequisite Course(s): -

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	-	04	40	60	40	60	0	0	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- develop logic building and problem-solving skills.
- understand how to calculate time complexity and space complexity of any algorithm.
- demonstrate and teach various methods for performance analysis of different types of algorithms.
- compare major algorithmic design techniques and demonstrate their application using suitable examples.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Algorithm Design and Analysis** Definition of the Algorithm, Characteristics of algorithms, Types of algorithm designs technique, Recursive Algorithms, Need of Analysis for the efficient algorithm, Asymptotic Notations, Analyzing control statement and Loop invariant, Analysis of different algorithms for best, worst and average case: sequential search, bubble sort, insertion sort, selection sort, heap sort	06	15
2.	**Divide and Conquer Algorithmic Design Method** Divide and conquer: basic algorithm and characteristics, Recurrence and different methods to solve recurrence, Binary Search: method and analysis of binary search for best, worst and average case for searches, Quick Sort, Merge Sort: method and analysis of algorithms, Finding the largest and smallest number in a list, Matrix Multiplication.	06	15
3.	**Greedy Method** The Greedy Method: basic algorithm and characteristics, Problem solving using Greedy technique- Fractional Knapsack Problem, Optimal merge patterns, Job sequencing with deadlines, Huffman Coding, Minimum cost spanning trees: Prim's and Kruskal's Algorithm, Single source shortest path.	06	10
4.	**Backtracking and Branch and Bound technique**	05	10

	Backtracking Method: basic algorithm and characteristics, Problem solving using Backtracking technique- N-Queens problem, Sum of subsets problem, Graph coloring, Hamiltonian cycle (TSP).		
5.	**Dynamic Programming Method** Dynamic Programming Method: basic algorithm and characteristics, Problem solving using Dynamic Programming technique- 0/1 Knapsack Problem, Making Change Problem, Multistage graphs, Optimal binary search trees, Travelling salesperson problem.	07	15
6.	**Branch and Bound technique** Branch and bound: basic algorithm and characteristics, FIFO Branch and Bound & Least Cost Branch & Bound, Problem solving using Brach and Bound technique- N-Queens using branch & bound, Least Cost Search, 15-puzzle, Solving Travelling salesperson problem.	07	15
7.	**String Matching** Introduction, The naive string-matching algorithm, The Rabin-Karp algorithm, String Matching with finite automata, The Knuth-Morris-Pratt algorithm.	04	12
8.	**Introduction to NP-Completeness** Definition of P and NP classes, Relation between complexity classes, Examples of problems in various classes.	04	08
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Implementation and Time analysis of Bubble sort.	02
2.	Implementation and Time analysis of Selection sort.	02
3.	Implementation and Time analysis of Insertion sort.	02
4.	Implementation and Time analysis of binary search algorithm.	02
5.	Implementation and Time analysis of Merge sort.	02
6.	Implementation and Time analysis of Quick sort.	02
7.	Implementation of Fractional Knapsack Problem.	02
8.	Implementation of Minimum Cost Spanning Tree.	04
9.	Implementation of Backtracking – N-Queens and Sum of Subsets Problems.	04
10.	Implementation of a 0-1 Knapsack Problem.	02
11.	Implementation of 15-puzzle problem using Branch and Bound.	02
12.	Implementation of Naïve and Rabin-Karp algorithm.	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein	PHI Learning

Reference Book(s):

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

Algorithm Design	Michael Goodrich, Roberto Tamassia.	Wiley Student Edition

Web Material Link(s):

- http://www.personal.kent.edu/~rmuhamma/Algorithms/algorithm.html
- https://nptel.ac.in/courses/106101060

Course Evaluation:

Theory:

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

Practical:

- Continuous Evaluation consists of performance of practical, which will be evaluated out of 10 marks per each practical and average of the entire practical will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance consists of 30 marks during End Semester Exam.
- External viva consists of 30 marks in End Semester Exam.

Course Outcome(s):

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

SECE2260	DESIGN & ANALYSIS OF ALGORITHMS
CO 1	Define the fundamental concepts and characteristics of algorithms.
CO 2	Explain various algorithm design techniques and their significance in solving computational problems.
CO 3	Apply appropriate algorithmic techniques to solve given examples and computational problems.
CO 4	Analyze and evaluate the time and space efficiency of algorithms designed using different techniques.
CO 5	Develop optimized algorithms to solve real-world computational problems effectively.

Mapping of CO with PO

SECE2260	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	PO11
CO 1	3	2	1								1
CO 2	3	3	2	1	2						1
CO 3	2	3	2	1	1						1
CO 4	3	3	3	2	2						2
CO 5	3	2	1								1

Mapping of CO with PSO

SECE2260	PSO1	PSO2	PSO3
CO 1	3	2	
CO 2	3	3	1
CO 3	3	2	1
CO 4	3	3	1
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 to Algorithm Design and Analysis	1, 2, 3, 4
2.	Divide and Conquer Algorithmic Design Method	1, 2, 3, 4, 5, 6
3.	Greedy Method	1, 2, 3, 4, 5, 6
4.	Backtracking Method	1, 2, 3, 4, 5, 6
5.	Dynamic Programming Method	1, 2, 3, 4, 5, 6
6.	Branch and Bound technique	1, 2, 3, 4, 5, 6
7.	String Matching	1, 2, 3, 4, 5, 6
8.	Introduction to NP-Completeness	1, 2, 4

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE2270
Course Name: Embedded Systems
Prerequisite Course(s): Digital Workshop (SECE2021) and Computer Organization (SECE2040)

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
02	02	-	03	40	60	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Embedded Systems and 8051 Architecture** Overview of embedded systems and applications – Computer organization and architecture – Microcontroller vs. Microprocessor – MCS51 family overview – 8051 microcontroller hardware structure – EdSim51 software installation and familiarization	04	12
2.	**Memory and Registers in 8051 Microcontroller** Code memory, internal & external RAM/ROM – Special Function Registers (SFRs) and Bit Memory – Basic registers: ACC, Rn, PC, SP, DPTR	04	12
3.	**8051 Timers, Counters and I/O Programming** Timer operation – TMOD & TCON SFRs – Initialization and reading of timers – Input/Output programming – Port programming concepts	04	12
4.	**Arithmetic and Logical Instructions** Arithmetic instructions: ADD, ADDC, SUBB, MUL, DIV, DA – Logical and comparison instructions – Rotate instructions – Data serialization – BCD arithmetic	04	10
5.	**Interfacing of 8051 Microcontroller** Interfacing with 7-segment display, 4x3 keypad, LCD, sensors, ADC/DAC, and external memory (RAM/ROM)	04	15
6.	**Arduino Platform and IDE** Arduino board overview – Arduino Uno architecture – Installing and familiarizing with Arduino IDE – Project development using Arduino Uno	04	15

7.	**Arduino Interfacing I** – Display & Input Devices Interfacing Arduino Uno with Keypad and 7-Segment Display – LCD Interfacing – Circuit diagrams and Arduino programming	02	12
8.	**Arduino Interfacing II** – Sensors and Actuators Interfacing Arduino Uno with sensors (light, temperature, PIR, ultrasonic) – Interfacing DC motor and relay – Mini-project implementation	04	12
	TOTAL	**30**	**100**

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Arduino board introduction and LED	02
2.	Arduino Light Sensor	04
3.	Arduino 7 Segment Display	04
4.	Arduino Distance sensor	04
5.	Arduino DC Motor Control	04
6.	Pir Motion Sensor	04
7.	Arduino Relay connectivity	04
8.	Arduino Temperature sensor	04
	TOTAL	**30**

Text Book(s):

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

Reference Book(s):

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

Web Material Link(s):

- www.keil.com
- http://www.8051projects.net/
- http://www.microcontroller-project.com/
- www.8051project.org/
- https://www.pjrc.com/tech/8051/

Course Evaluation:

Theory:

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

Practical:

- Continuous Evaluation consists of the performance of practical, which will be evaluated out of 20 marks per each practical and the average of the entire practical will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks.
- External viva consists of 30 marks.

Course Outcome(s):

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

SECE2270	EMBEDDED SYSTEMS
CO 1	Develop knowledge and understand the fundamental embedded systems' design paradigms, architectures, challenges and possibilities, both with respect to software and hardware.
CO 2	Design and implement embedded systems such as integrating embedded subsystems and applications in
CO 3	Design and develop several smart applications using arduino uno.
CO 4	Apply and implement learned algorithm designed techniques and data structure to solve
CO 5	Analyze the type of microcontroller needed while developing applications.

Mapping of CO with PO

SECE2270	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	1	1	2		2				
CO 2	3	3	2	2	3				1		
CO 3	3	2	3	2	3				2		
CO 4	3	3	2	3	3						1
CO 5	2	3	2	3	3						1

Mapping of CO with PSO

SECE2270	PSO1	PSO2	PSO3
CO 1	2	2	1
CO 2	3	3	2
CO 3	3	3	2
CO 4	2	2	1
CO 5	2	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	Computer architecture and the 8051 Microcontroller.	1, 2
2	Type of Memory of the 8051 Microcontroller.	1, 2
3	Timers and I/O Programming	2, 3

4	Arithmetic and Logic Instruction	2, 3, 5
5	Interfacing of 8051 microcontroller	3, 4, 6
6	Arduino Microcontroller Board	1, 2
7	Interfacing the Arduino Uno into Keypad and 7-Segment	3, 6
8	Interfacing the Arduino Uno into Keypad and LCD	3, 6
9	Interfacing the Arduino Uno into Sensor, and DC-Motor	3, 6

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE2310
Course Name: Computer Networks
Prerequisite Course(s):

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	--	04	40	60	40	60	--	--	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand the communication network design.
- understand state-of-the-art in network protocols, architectures.
- learn to develop an understanding of different components of computer networks, various protocols, technologies and their applications.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Data Communication and Networking** Overview of Data Communication and Networking Components of a Data Communication System Types of Networks (LAN, MAN, WAN, Internet), Network Topologies	04	10
2.	**Network Models and Standards** Protocol Hierarchies and Layer Design Issues Interfaces and Services OSI Reference Model – Layers and Functions TCP/IP Reference Model – Comparison with OSI Model Network Devices and Standards Organizations	07	15
3.	**Physical Layer** Transmission Media (Guided & Unguided) Data and Signal Transmission Concepts Asynchronous and Synchronous Transmission Multiplexing Techniques (FDM, TDM, WDM), Switching Techniques	04	10
4.	**Data Link Layer** Layer design issues, services provided to network layers, Framing, Error Detection, and Correction Techniques, Flow control, Data link control protocols – Simplex protocol, sliding window protocol, Utopia, Stop N Wait, Automatic Repeat Request. Go Back N, Selective Repeat Protocols.	07	15
5.	**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.	07	15
6.	**Network Layer** A network Layer design issue, Routing algorithms, and protocols –	08	15

	OSPF, BGP, RIP, Congestion Control Algorithms, Internetworking – IPV4 & IPV6, Addressing, N/W Layer Protocols, and subnets.		
7.	**Transport Layer** Transport services, Design issues, transport layer protocols – TCP & UDP, Congestion Control, QOS and its improvement.	04	10
8.	**Application Layer** Client-Server Model, WWW, HTTP, DNS, DHCP, FTP, and Email Protocol – IMAP, POP3, SMTP	04	10
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	To study and prepare LAN cables (cross and straight) using crimping tool, to configure LAN.	02
2.	To study and Physical examine different network device and their usage.	02
3.	Configure switch and router in small network and identify the difference.	02
4.	To Study of network IP – IPv4 & IPv6.	02
5.	Configure Network Topology using Cisco Packet tracer.	04
6.	To monitor network traffic using Wire Shark	02
7.	To get the MAC or Physical Address of the system Using Address Resolution Protocol.	02
8.	To Configure network using Routing Information Protocol (RIP)	04
9.	To configure network state routing protocol (OSPF).	02
10.	To configure Border Gateway Protocol.	02
11.	To configure Application Layer protocols: DHCP and DNS and understand its functionality in Wireshark/ Packet tracer.	02
12.	Understand functionality of TCP & UDP using Wireshark/ Packet Tracer.	02
13.	Understand functionality of HTTP & FTP using Wireshark/ Packet Tracer.	02
	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):

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

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

SECE2310	COMPUTER NETWORKS
CO 1	Illustrate the foundational concepts of data communication, network devices, topologies, and protocol layering in computer networks.
CO 2	Analyze the functions and design issues of the physical and data link layers, including transmission techniques, error detection, and flow control methods.
CO 3	Apply medium access control protocols and LAN technologies to solve channel allocation and collision management problems.
CO 4	Compare and evaluate routing, addressing, and congestion control algorithms used in the network and transport layers
CO 5	Design and integrate network applications using common application layer protocols such as HTTP, DNS, DHCP, FTP, and Email systems.

Mapping of CO with PO

SECE2310	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11
CO 1	2	1	1	1	2		2			3	
CO 2	3	1	1	2	1		3	1			3
CO 3	2	2	2		1		3		1	2	
CO 4		2	2	1	1	2	2			2	
CO 5	3	2	3	2	3			1	2	3	2

Mapping of CO with PSO

SECE2310	PSO1	PSO2	PSO3
CO 1	3	1	-
CO 2	3	2	1
CO 3	3	3	1
CO 4	3	2	1
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 to Data Communication and Networking	2,4
2.	Network Models and Standards	2,4
3.	Physical Layer	1,2,4
4.	Datalink Layer	2,4
5.	Medium Access Layer	1,2
6.	Network Layer	2,3,5,6

7.	Transport Layer	2,4
8.	Application Layer	2,5

P P Savani University

School of Engineering

Department of Information Technology

Course Code: SEIT2260
Course Name: Operating System
Prerequisite Course(s):

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	--	04	40	60	40	60	--	--	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- provide a fundamental understanding of the operating system functions, architecture, services, and interconnections among services within operating systems.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Operating System** Basics of Operating System: Definition, Types of Operating System, Operating System Structure, Operating System Services, Concept of Virtualization.	03	07
2.	**Processes and Threads Management** Concept of Process: Definition, Process State, Process State Transition, Process Control Block, CPU Scheduling: CPU-I/O Burst Cycle, Types of Schedulers, Context Switching	03	07
3.	**CPU Scheduling Algorithms & Multithreading** Preemptive and Non- Preemptive Scheduling, Scheduling Criteria, Scheduling Algorithms: FCFS, SJF, Priority, Round Robin, Multilevel Queue, Lottery Scheduling; Threads, Types of Threads, Multithreading	06	13
4.	**Inter Process Communication** Race Conditions, Critical Regions, Mutual Exclusion with Busy Waiting, Sleep and Wakeup, Semaphores, Mutexes, Monitors, Message Passing, Classical IPC Problems: The Dining Philosopher Problem, The Readers and Writers Problem	07	15
5.	**Deadlocks** Resources, Conditions for Deadlocks, Deadlock Modelling, Deadlock Detection and Recovery, Deadlock Avoidance, Deadlock Prevention.	04	08
6.	**Memory Management - I** Main memory: Background, Swapping, Contiguous Memory Allocation, Segmentation, Paging: Introduction to Paging, Translation look-aside buffer (TLB), Structure of Page Table	05	12
7.	**Memory Management – II** Virtual Memory, Demand Paging, Page Replacement Algorithms: FIFO, Optimal, LRU, NRU, Second Chance, Thrashing	06	13
8.	**File & Disk Management** File Types, File Attributes, Access Methods, Operations, Directories, Allocation Methods: Contiguous, Linked, Indexed; Disk Structure, Scheduling: FCFS, SSTF, SCAN, C-SCAN, LOOK, C-LOOK; Disk Space Management, RAID Levels	11	25

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 any two CPU scheduling algorithms. (E.g. FCFS, SJF, Round Robin etc.)	04
5.	Simulate any two 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 any two page replacement algorithms. (E.g. FIFO, LRU, Optimal)	04
8.	Simulate any two disk scheduling algorithms. (E.g. FCFS,SCAN,C-SCAN)	04
9.	Case studies: OS in Industries, Protection and Role-based Access Controls of OS.	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
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 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

SEIT2260	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 and achieve a comprehensive

	understanding of memory management during process execution.
CO 4	Comprehend how an operating system manages file systems, mass storage, and I/O operations.

Mapping of CO with PO

SEIT2260	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11
CO 1	3	2	1				1			1	
CO 2	2	2	2	1	2					2	
CO 3	3	3	3	3	3		2	1		2	
CO 4	3	3	3	2	3	1		1	2	3	2

Mapping of CO with PSO

SEIT2260	PSO1	PSO2	PSO3
CO 1	3	2	1
CO 2	2	2	1
CO 3	3	3	2
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 to Operating System	1, 2, 4
2.	Processes and Threads Management	1, 2, 3
3.	CPU Scheduling Algorithms & Multithreading	2, 3, 4, 5
4.	Inter Process Communication	2, 3, 4, 5
5.	Deadlock	2, 3, 4, 6
6.	Memory Management - I	1, 2, 3
7.	Memory Management - II	1, 2, 3, 4, 6
8.	File & Disk Management	1, 2, 3, 4, 5