PPSU

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

B. TECH.
COMPUTER SCIENCE & ENGINEERING (CYBER SECURITY)

SYLLABUS BOOK

AY 2023-24

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

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

Graduates will demonstrate ability to:

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

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

PSO No	PROGRAMME SPECIFIC OUTCOMES (PSO) COMPUTER SCIENCE ENGINEERING (CYBER SECURITY)
PSO 1	Develop expertise in utilizing contemporary tools and technologies in cybersecurity to identify, analyze and mitigate threats, ensuring data integrity, confidentiality and availability of digital assets and systems.
PSO 2	Design and implement secure information systems and policies, applying principles of cryptography, network security, and risk management to solve real-world cybersecurity challenges and enhance the security posture across various sectors.
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.

(Computer Science & Engineering - Cyber Security)

P P Savani University

School of Engineering

Effective From: 2023-24

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 – CYBER SECURITY PROGRAMME AY: 2023-24

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
	SESH1120	Linear Algebra	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SEME1110	Hardware Workshop	ME	0	4	0	4	4	0	0	100	0	0	0	100
	SECE1110	Software Workshop	CE	0	4	0	4	2	0	0	100	0	0	0	100
	SEIT1110	Cyberspace Awareness	IT	2	0	0	2	2	40	60	0	0	0	0	100
	SEIT1120	Competitive Quantitative Aptitude	IT	2	0	0	2	2	40	60	0	0	0	0	100
	SECE1120	Joy of Programming	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SESH1130	Conceptual Experimental Physics	SH	3	2	0	5	4	40	60	40	60	0	0	200
	SECH1110	Fundamental Chemistry & Environmental Science	CH	3	2	0	5	4	40	60	40	60	0	0	200
	SEME1120	Fundamentals of Technical Drawing	ME	0	4	0	4	4	0	0	40	60	0	0	100
	SECV1110	Core Engineering Concepts	CV	3	2	0	5	4	40	60	40	60	0	0	200
	CFLS2130	Intermediate Communicative English	CFLS	2	2	0	4	3	100	00	100	0	0	0	200
	CLSC2070	Essentials of Entrepreneurship	CFLS/SLM	2	0	0	2	2	100	0	0	0	0	0	100
						Total	**52**	**45**							**2000**

Group 1	SESH1110	Calculus	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SEME1110	Hardware Workshop	ME	0	4	0	4	4	0	0	100	0	0	0	100
	SEIT1110	Cyberspace Awareness	IT	2	0	0	2	2	40	60	0	0	0	0	100
	SESH1130	Conceptual Experimental Physics	SH	3	2	0	5	4	40	60	40	60	0	0	200
	SEME1120	Fundamentals of Technical Drawing	ME	0	4	0	4	4	0	0	40	60	0	0	100
	SECE1120	Joy of Programming	CE	3	2	0	5	4	40	60	40	60	0	0	200
	CFLS2130	Intermediate Communicative English	CFLS	2	2	0	4	3	100	0	100	0	0	0	200
						Total	**29**	**26**							**1100**
Group 2	SESH1120	Linear Algebra	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SECE1110	Software Workshop	CE	0	4	0	4	2	0	0	100	0	0	0	100
	SEIT1120	Competitive Quantitative Aptitude	IT	2	0	0	2	2	40	60	0	0	0	0	100
	SECH1110	Fundamental Chemistry & Environmental Science	CH	3	2	0	5	4	40	60	40	60	0	0	200
	SECV1110	Core Engineering Concepts	CV	3	2	0	5	4	40	60	40	60	0	0	200
	CLSC2070	Essentials of Entrepreneurship	CFLS/SLM	2	0	0	2	2	100	0	0	0	0	0	100
						Total	**23**	**19**							**900**

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:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Calculus** Limits, Continuity, Types of Discontinuity, Successive Differentiation, Rolle's Theorem, LMVT, CMVT, Maxima and Minima.	9	20
2.	**Sequence and Series-I** Convergence and Divergence, Comparison Test, Integral Test, Ratio Test, Root Test, Alternating Series, Absolute and Conditional Convergence.	9	20
3.	**Sequence and Series-II** Power series, Taylor and Macluarin series, Indeterminate forms and L'Hospitals Rule.	5	10
Section II			
Module No.	Content	Hours	Weightage in %
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	4
2.	Calculus-2	4
3.	Calculus-3	2
4.	Sequence and Series-1	4
5.	Sequence and Series-2	2
6.	Sequence and Series-3	2
7.	Partial Derivatives-1	4
8.	Partial Derivatives-2	2
9.	Curve tracing-1	4
10.	Curve tracing-2	2
	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 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 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-PSO

SESH1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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	3		
CO 2	1	1	
CO 3	1	2	
CO 4	3	2	
CO 5	1	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 Science and 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

- analyse 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:

Section I			
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
Section II			
Module No.	Content	Hours	Weightage in %
3.	**Linear Transformation** Introduction of Linear Transformation, Kernal and Range, Rank and Nullity, Inverse of Linear Transformation, Rank Nullity Theorem, Composition of Linear Maps.	9	20
4.	**Inner Product Space** Inner Product, Angle and Orthogonality, Orthogonal projection, Gram-Schmidt process and QR Decomposition, Least square decomposition.	8	20
5.	**Beta and Gamma function**	5	10

	Improper Integrals, Convergence, Properties of Beta and Gamma Function, Duplication Formula (without proof)		
	TOTAL	45	100

List of Tutorial:

Sr. No.	Name of Tutorial	Hours
5.	Matrix Algebra-1	4
6.	Matrix Algebra-2	2
7.	Vector Space-1	4
8.	Vector Space-2	2
9.	Linear Transformation-1	4
10.	Linear Transformation-2	2
11.	Inner Product Space-1	4
12.	Inner Product Space-2	2
13.	Beta and Gamma function-1	4
14.	Beta and Gamma function-2	2
	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 & CALCULUS

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-PSO

SESH1120	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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	2	
CO 2	1	1	
CO 3	2	2	
CO 4	2	2	
CO 5			

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 Mechanical Engineering

Course Code: SEME1110

Course Name: Hardware 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	
--	04	--	04	--	--	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.

Course Content:

Module No.	Contents	Weightage in %
1.	**Introduction:** Introduction to Various Shops / Sections and Workshop Layouts, Safety Norms to be Followed in a Workshop. **Fitting Shop:** Introduction of Fitting Shop; Safety; Making a Job as perDrawing including Marking and other Performing Operations. **Carpentry and Drilling Shop:** Introduction of Carpentry Shop; Preparation of Job as per Drawing including Marking and other Performing Operations. **Introduction to Machine Tools:** Introduction and Demonstration of various Machine Tools like Lathe, Drilling, Grinding, Hack Saw Cutting etc. **Introduction to Welding & Plumbing:** Introduction and Demonstration of Welding process. Introduction and Demonstration of Plumbing Shop.	25
2.	**Introduction to Computer Hardware** Computer hardware structure, Identify and understand hardware components: CPU, Motherboard, RAM, HDD, SSD, Keyboard, Ports, Mouse, Monitor, Printer, UPS/SMPS, etc. **Hardware Maintenance and Troubleshooting** Assembling and disassembling a PC, connectors and cables, BIOS setup, Disk management, Device manager, Task manager, Network management, Backup/recovery disk.	25

3.	**Electrical and Electronic Skill:** Use of Multimeter. Soldering of electrical circuits having discrete components (R, L, C & diode) and ICs on PCB, connections on Breadboard	25
4.	**Logic Gates:** Digital Electronics, Symbol and truth table of Logic gates (OR, AND, NOT, NAND, NOR and EX-OR gate), De morgan's theorem. **Cathode Ray Oscilloscope:** Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only– no mathematical treatment), brief discussion on screen phosphor, visual persistence & Use of CRO for the measurement of voltage (dc or ac frequency, time period. Special features of dual trace, Digital storage Oscilloscope: Block diagram and principle of working.	25
	TOTAL	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction and Demonstration of Safety Norms. Different Measuring Instruments. Introduction and Demonstration of Machine Shop. To Perform a Job of Fitting Shop.	12
2.	To Perform a Job of Carpentry Shop. Introduction and Demonstration of Plumbing Shop & Welding Process.	15
3.	(I)Identify computer hardware layout and components (II)Perform assembling and disassembling of PC	08
4.	Configure BIOS, disk, network and other hardware management	05
5.	Understanding the electronic components and study of Shouldering and Desoldering of electronic components on PCB Board.	04
6.	Understanding the connection on Breadboard and study of Alternate Flashing LED Lights using Breadboard.	06
7.	Verify the truth table of Logic gates and De morgan's theorem on IC trainer board.	04
8.	Study of Cathode Ray Oscilloscope.	06

Text Book(s):

Title	Author(s)	Publication
Elements of Workshop Technology	S K Hajra Choudhury	Media Promoters & Publishers
A text book in Electrical Technology	B L Theraja	S Chand and Co

Reference Book(s):

Title	Author(s)	Publication
Basic Electronics: A text lab manual	P.B. Zbar, A.P. Malvino, M.A. Miller	Mc-Graw Hill.
Digital Electronics	Subrata Ghoshal	Cengage Learning

Course Evaluation:

Practical:

- Continuous Evaluation consists of Performance of Practical/Tutorial which will be evaluated outof 10 for each practical/Tutorial 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
- Internal Viva consists of 30 Marks.
- Practical performance/quiz/drawing/test will consist of 30 Marks.

Course Outcome(s):

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

SEME1110	HARDWARE WORKSHOP
CO 1	Apply the application of mechanical workshop such as fitting, drilling and carpentry. Understand various tools of mechanical workshop and understand its applications.
CO 2	Identify and inspect hardware components and interpret latest development of the field.
CO 3	Make students capable of analysing and solving the varieties of problems coming up in the electrical measurements and also enable the students to design as well as trouble shoots the circuits and networks through hands-on mode.
CO 4	Develop skill to build, and troubleshoot digital circuits.

Mapping of CO with PO-PSO

SEME1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1	2	1		3	3		3	3	1	3
CO 2	2	1	1	2	2	2			2	2	1	2
CO 3	3	2	2	2	2	2	2	3	2	2	3	3
CO 4	2	3	2	3	3		3	3	1	2	1	2

Mapping of CO with PSO

SEME1110	PSO1	PSO2	PSO3
CO 1	3	1	1
CO 2	1	1	2
CO 3	1	3	3
CO 4	2	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	Introduction, Fitting Shop, Carpentry Shop and Drilling Shop, Introduction to Machine Tools, Welding and Plumbing	2,3,4,6
2	Introduction to Computer Hardware, Hardware Maintenance and Troubleshooting	1,2,3,4,5,6
3	Understand and designing of Electrical circuit	2,3,5
4	Cathode ray oscilloscope and Digital Electronics	1,2,3,5

P P Savani University

School of Engineering

Department of Computer Engineering

Course Code: SECE1110

Course Name: Software 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	
00	04	--	02	--	--	100	--	--	--	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- Provide a comprehensive knowledge of overall basic computer software tools and technology.
- Providing hands-on experience related to basic software installation, usage of Operating systems, and various essential software utilities.

Course Content:

Section I		
Module No.	Content	Weightage in %
1.	**Software Fundamentals** Introduction to Software, Types of software, Applications of software, Web based software, Understand Software specific requirements, Installation of Software	10
2.	**Operating System** Introduction of OS, Functions of Operating System, Types of OS, Installation of Windows and Linux OS, Linux architecture, Role of Device Drivers in OS, Shell scripting, Command structure, and general-purpose utility.	25
3.	**DOS Commands** Getting Started with DOS, Introduction to Command Prompt, System Files and Command, Creating directories, Traversing through directories, Deleting directories, Viewing Files within a directory.	15
Section II		
Module No.	Content	Weightage in %
4.	**Application Software** Introduction to Application Software, Types of Application Software, Installation of Application Software, Logo Designing, Creating Flowcharts and diagrams, Introduction To Google Apps.	10
5.	**Data Analysis using Application Software** Introduction to Spreadsheets, Spreadsheet Functions to Organize Data, Introduction to Filtering, Pivot Tables, and Charts, VlookUp and HlookUp in Spreadsheets.	15

6.	**Website Creation** Creating a website using Google Sites, Creating Web Pages, Working with Images, Working with Documents on Web Pages. Introduction to Wordpress, Installing Web Server and Wordpress, Creating Web pages in Wordpress.	25
	TOTAL	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Study of Different Software.	2
2.	Installation of any 2 software with required plugins and libraries.	4
3.	Study of Different Operating Systems.	2
4.	Creation of Bootable Pen drive.	2
5.	Installation of Windows OS.	2
6.	Installation of Linux OS using VMWare.	2
7.	Study of Basic commands of Linux/UNIX.	4
8.	Study of Basic commands of DOS.	4
9.	Design logo using Canva.	2
10.	Draw a Flowchart to find maximum of two numbers in either draw.io or Microsoft Visio or LucidChart.	2
11.	Study of different Google Apps.	4
12.	Create a Google Doc and Google sheet and share with 2 classmates.	2
13.	Demonstrate working of HlookUp and VlookUp in Excel.	2
14.	Create different types of charts in Excel.	4
15.	Demonstrate Data Analysis in Excel.	4
16.	Create a Google Website with minimum two pages showing your personal details.	4
17.	Demonstrate embedding of a youtube video and pdf document on a web page in google site.	4
18.	Demonstrate placing Map and hyperlinks on web page in Google Site.	4
19.	Create a wordpress site and create minimum three web pages and menu to navigate between the pages.	4
20.	Demonstrate the use of Accordian in wordpress.	2
	TOTAL	60

Text Book(s):

Title	Author/s	Publication
Fundamentals Of Computers, 2nd Edition	Reema Thareja	Oxford University Press
Excel 2019 Bible	Michael Alexander, Richard Kusleika, John Walkenbach	Wiley

Reference Book(s):

Title	Author/s	Publication
UNIX : Concepts and Applications | 4th Edition	Sumitabha Das	McGraw Hill Education

Web Material Link(s):

- https://sites.google.com/site/willkimbley/google-apps-tutorials

- https://www.cs.upc.edu/~robert/teaching/foninf/doshelp.html
- https://www.javatpoint.com/software-engineering
- https://www.wikihow.com/Create-a-Website-Using-Google-Sites
- https://www.wpbeginner.com/guides/

Course Evaluation:

Practical:

- Continuous Evaluation consists of performance of practical, which should be evaluated out of 10 marks per each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks during Internal practical Exam.
- Mini Project performance consists of 40 marks during End Semester Exam.

Course Outcome(s):

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

SECE1110	**Software Workshop**
CO 1	Understand the types of computer software with their requirements and how to use as per the need.
CO 2	Install different Operating Systems and learn commands used in the OS.
CO 3	Get familiar with the application software and different applications of application software
CO4	Achieve some useful information from data through analysis and represent it with different views like charts, graphs etc.
CO 5	Learn the designing and development of website to have a global communication.

Mapping of CO with PO:

SECE1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2			1							2
CO 2	3	3	2		3					2		3
CO 3	3	2	1	1	2							3
CO 4	2		3	3	3				1	2		3
CO 5	3		3	2	3			1				3

Mapping of CO with PSO:

SECE1110	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	3	
CO 3	3	2	
CO 4	3	3	2
CO 5	3	3	3

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	Software Fundamentals	1,2
2	Operating System	1,2,3,6
3	Disk Operating System	2,3
4	Application Software	2,3,4,5

5	Data Analysis using Application Software	3,4,5,6
6	Website Creation	2,3,6

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT1110
Course Name: Cyberspace Awareness
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	
2	--	--	2	40	60	--	--	--	--	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to,

- understand governance, regulatory, legal, economic, environmental, social, and ethical context of cyber security.
- equip students with the technical knowledge and skills needed to protect and defined against cyber threats.
- help students to protect the one's data, systems, and networks from malicious attacks and cyber threats.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Cyber space** Cyber space, Cyber Crime and its Types, Overview of Cyber Security, Cyber Attacks in History, Internet Governance, Hacking and its Types, Cracking, Overview of System and Web Vulnerability, OWASP	06	20
2.	**Cyber Threats** Various Cyber Threats, Malware, Phishing, Password Attacks, DOS attack, Man in the Middle, Drive by download, Malvertising, Rogue Software, Cyber Warfare and its conflicts, Cyber Terrorism, Case studies	09	30
Section II			
Module No.	Content	Hours	Weightage in %
3.	**Cyber security Practices** Cyber Security Practices and dos and don'ts, Data Privacy and Security, Security Controls, Overview of social media and its security, E-Commerce, Digital payments and its security, Tools and technology for cyber security, Platform to report and combat cyber crime, Case studies	05	15

4.	**Cyberspace and the Law** Cyber Security Regulations, Cyber Law, need for a Comprehensive Cyber Security Policy, Need for an International convention on Cyber space, Contemporary crime, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards, The INDIAN Cyberspace, Indian IT Act 2000, Indian IT Act 2008, Case studies	06	15
5.	**Cyber Forensics** Introduction to Cyber Forensics, Handling Preliminary analysis, Investigating Investigations, Controlling an Investigation, Legal Policies, Case studies	04	20
	TOTAL	30	100

Text Book(s):

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

Reference Book(s):

Title	Author/s	Publication
Cyber Security	Nina Godbole, Sunit Belapure	Wiley India, New Delhi
The Indian Cyber Law	Suresh T. Vishwanathan;	Bharat Law House New Delhi

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.

Course Outcome(s):

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

SEIT1110	Cyberspace Awareness
CO 1	Understand Concepts of Cyber space.
CO 2	Analyze the Concepts of Cyber Threats.
CO 3	Elaborate the overview of social media and understanding cybercrimes.
CO 4	Identify cyber laws and cyber acts in India.
CO 5	Explore different case studies based on cyber-Forensics.

Mapping of CO with PO:

SEIT1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2				3						2
CO 2	2	3				3						2
CO 3	3	2				3			2			3
CO 4		3				3		3		2		3
CO 5		2			2			2		3		3

Mapping of CO with PSO:

SEIT1110	PSO1	PSO2	PSO3

CO 1	3	2	2
CO 2	2	3	2
CO 3	3	2	3
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 Cyber space	1
2	Cyber Threats	1,2
3	Cyber security Practices	1,2,3
4	Cyberspace and the Law	1,2
5	Cyber Forensics	1,23

P P Savani University

School of Engineering

Department of Information Technology

Course Code: SEIT1120

Course Name: Competitive Quantitative Aptitude

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	40	60	--	--	--	--	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

- This course is designed to suit the need of the outgoing students and to acquaint them with frequently asked patterns in quantitative aptitude and logical reasoning during various examinations and campus interviews.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Quantitative Ability (Basic Mathematics)** Number Systems, LCM and HCF, Decimal Fractions, Simplification, Square Roots and Cube Roots, Average, Problems on Ages, Surds & Indices, Percentages, Problems on Numbers, Quadratic Equations	5	15
2.	**Quantitative Ability (Applied & Engineering Mathematics)- Part I** Logarithm, Permutation and Combinations, Probability, Profit and Loss, Simple and Compound Interest,	5	35
3.	**Quantitative Ability (Applied & Engineering Mathematics) -Part II** Time, Speed and Distance, Time & Work, Ratio and Proportion, Mixtures and Allegation	5	20
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Data Interpretation** Data Interpretation, Tables, Column Graphs, Bar Graphs, Line Charts, Pie Chart, Venn Diagrams	6	20
5.	**Logical Reasoning (Deductive Reasoning)** Analogy, Blood Relation, Directional Sense, Number and Letter Series, Coding – Decoding, Calendars, Clocks, Seating Arrangement, Syllogism	6	20

6.	**Mensuration & Trigonometry** Two-dimensional (2D) and Three-dimensional (3D) Mensuration, Degree and Radian Measures, Trigonometric Ratios, Complementary Angles, Height and Distance, Standard Identities, Area, Inequalities	3	10
	TOTAL	30	100

Text Book(s):

Title	Author/s	Publication
Quantitative aptitude for Competitive examination	R S Agarwal	S. Chand
A Modern Approach to Verbal & Non-Verbal Reasoning	R S Agarwal	S. Chand

Reference Book(s):

Title	Author/s	Publication
Analytical and Logical reasoning	Sijwali B S	arihant

Web Material Link(s):

- https://prepinsta.com/
- https://www.indiabix.com/
- https://www.javatpoint.com/

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.

Course Outcome(s):

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

SEIT1120	Competitive Quantitative Aptitude
CO 1	Understand the basic concepts of quantitative ability
CO 2	Understand the basic concepts of logical reasoning Skills
CO 3	Acquire satisfactory competency in use of reasoning
CO4	Solve campus placements aptitude papers covering Quantitative Ability, Logical Reasoning Ability
CO 5	Compete in various competitive exams like CAT, CMAT, GATE, GRE, GATE, UPSC, GPSC etc

Mapping of CO with PO:

SEIT1120	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2							2			3
CO 2	2	3							2			3
CO 3	2	3							3			3
CO 4		3							3			3
CO 5									3	3		3

Mapping of CO with PSO:

SEIT1120	PSO1	PSO2	PSO3
CO 1	2	2	3
CO 2	2	3	3
CO 3	2	3	3
CO 4	2	3	3
CO 5			3

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	Quantitative Ability (Basic Mathematics)	1, 3, 5
2,3	Quantitative Ability (Applied & Engineering Mathematics)	1, 2, 3, 5
4	Data Interpretation	2, 3, 6
5	Logical Reasoning (Deductive Reasoning)	2, 4, 5
6	Mensuration & Trigonometry	1, 3, 5

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE1120
Course Name: Joy of Programming
Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- identify appropriate approach to computational problems.
- develop logic building and problem-solving skills.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Motivation of Programming:** Use of Programming, Importance of Programming, Discussion of different Case Study	5	14
2.	**Welcome to Programming:** Introduction of Programming, Flow Charts and Algorithms, Debugging, Tracing the execution of the Program, Watching Variables Values in Memory, Character Set, Keyword and Identifiers, Constants and Variables, Data Types - Declaration and Initialization, Basic Input, and Output Operations, Symbolic Constants, Overflow and Underflow of Data.	9	18
3.	**Conditional Statements and Looping Statements:** Decision Making & Branching: Decision Making with If and If - else Statements, Nesting of If-else Statements, The Switch and go-to statements. Looping: The while Statement, The Break Statement &The Do While loop, The FOR loop, Jump within loops - Programs.	9	18
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Collection of Data:** Introduction, One-dimensional Arrays, Two-dimensional Arrays, Concept of Multidimensional Arrays, Declaring and Initializing String Variables, Arithmetic Operations on Characters, Putting Strings Together, Comparison of Two Strings, String Handling Functions, Dictionary, List, Tuples and Sets.	10	20
5.	**Functions** Introduction to Functions, defining a Function, Calling a Function, Types of Functions, Function Arguments, Anonymous Functions, Global and Local Variables, Recursion	6	15
6.	**Building Desktop Application**		

	Exploring the Tkinter Library in Python, Creating basic Desktop application using Tkinter	6	15
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Working with basic elements of C languages (different input functions, different output functions, different data types, and different operators).	2
2.	Working with control structures (if statement, if-else statement, nested if-else statement, switch statement, break statement, goto statement).	2
3.	Working with array and strings in C.	4
4.	Introduction to Python (Introduction to IDLE, different data types, Input Output in Python, Operators, Operator precedence).	2
5.	Implementation of Dictionaries, Sets, Tuples and Lists and its various methods in Python.	6
6.	Working with functions in C/Python.	2
7.	Working with recursive function in C/Python.	2
8.	Building desktop application of your own calculator in Python.	4
9.	Case Study: a. Sorting : Arrange the books b. Searching : Find in seconds c. Recursion : Tower of Hanoi	6
	TOTAL	30

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

Text Book(s):

Title	Author(s)	Publication
Programming in ANSI C	E. Balagurusamy	Tata McGraw Hill
Python Programming: A modular approach	Sheetal Taneja, Naveen Kumar	Pearson

Reference Book(s):

Title	Author(s)	Publication
Programming in C	Ashok Kamthane	Pearson
Python Cookbook	David Ascher, Alex Martelli Oreilly	O Reilly Media

Web Material Link(s):

- https://www.tutorialspoint.com/cprogramming/index.htm
- https://www.w3schools.com/c/
- https://www.tutorialspoint.com/python/
- https://www.w3schools.com/python/

Course Evaluation:

Theory:

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

Practical:

- Continuous Evaluation consists of the performance of practical which will be evaluated out of 10 for each practical and average of the same will be converted to 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 Outcomes:

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

SECE1120	JOY OF PROGRAMMING
CO 1	Immediately analyze the syntax and semantics of the computer languages and apply it in programs.
CO 2	Implement computing solutions using logic building and problem-solving skills of a given programming language.
CO 3	Interpret the fundamental language syntax, semantics and fluent in the use of python or any computer language control flow statements.
CO 4	Determine the methods to create and manipulate programs by utilizing the data structures like lists, dictionaries, tuples and sets with emphasis on Python.

Mapping of CO with PO:

SECE1120	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2			3			2	2			3
CO 2	2	3			3				2			3
CO 3	3	2			3							3
CO 4	3				3							3

Mapping of CO with PSO:

SECE1120	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	3	2
CO 3	3	2	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.	Motivation of Programming	1, 2, 4
2.	Welcome to Programming	1, 2, 3
3.	Conditional Statements and Looping Statements	1, 2, 3
4.	Collection of Data	1, 2, 3
5.	Functions	2, 3, 4, 6
6.	Building Desktop Application	2, 3, 4, 6

P P Savani University
School of Engineering

Department of Chemical Engineering

Course Code: SECH1110
Course Name: Fundamental Chemistry & Environmental Science
Prerequisite Course(s): -

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
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 concepts of chemistry, including atoms, molecules, and chemical processes.
- Apply the scientific method to examine chemical phenomena, including the design and execution of experiments, data analysis, and evidence-based conclusion drawing.
- Evaluate the causes and consequences of environmental problems and propose solutions based on scientific evidence.
- Integrate knowledge from multiple disciplines to analyze environmental problems and propose effective solutions.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Chemistry** Overview of the scientific method and chemistry as a science, Basic concepts of matter, including atoms, molecules, and the periodic table, Introduction to chemical bonding and intermolecular forces, Basic principles of chemical reactions, including stoichiometry and reaction types	6	15
2.	**Chemical Thermodynamics and Kinetics** Introduction to thermodynamics and the laws of thermodynamics, Energy and enthalpy changes in chemical reactions, Introduction to chemical kinetics and reaction rates, Factors affecting reaction rates, including temperature, concentration, and catalysts	6	15
3.	**Properties of Matter and Solutions** Physical properties of matter, including states of matter and phase changes, Solutions and their properties, including solubility and colligative properties, Introduction to acids and bases and their properties, Chemical equilibrium and the equilibrium constant	5	10
4.	**Organic Chemistry** Introduction to organic chemistry and the basics of carbon chemistry, Functional groups and their properties, Nomenclature and isomerism in organic compounds, Introduction to organic reactions and mechanisms	6	10

Section II			
Module No.	Content	Hours	Weightage in %
5.	**Introduction to Environment** Definition, principles and scope of Environmental Science, Impacts of development on Environment, Environmental Degradation, The interdisciplinary nature of environmental science, Concept of 4R's	06	10
6.	**Environmental Pollution** a) Water Pollution: Introduction – Water Quality Standards, Sources of Water Pollution, Classification of water pollutants, Effects of water pollutants. b) Air Pollution: Composition of air, Structure of atmosphere, Ambient Air Quality Standards, Classification of air pollutants, Sources of common air pollutants like PM, SO_2, NO_X, Auto exhaust, Effects of common air pollutants c) Noise Pollution: Introduction, Sound and Noise, Noise measurements, Causes and Effects. d) Solid Waste: Generation and management e) Bio-medical Waste: Generation and management f) E-waste: Generation and management	08	20
7.	**Social Issues and Environment** Sustainable Development, Equitable use of Resources for sustainable lifestyle and it's benefits, Water conservation, Climate Change, Global Warming and Green House Effect, Acid Rain, Depletion of Ozone layer, Carbon Footprint	08	20
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Acid-base titration adding a base of known concentration to an acid of unknown concentration until the reaction is complete, and the concentration of the acid is determined.	02
2.	Determination of the boiling point of a liquid heating a sample of a liquid and observing the temperature at which it boils.	02
3.	Determination of the density of a liquid weighing a known volume of a liquid and calculating its density.	04
4.	Determination of the pH of a solution using a pH meter to measure the acidity or basicity of a solution.	04
5.	Flame test: burning a sample of a substance and observing the color of the flame to identify the presence of certain elements.	04
6.	Preparation of a salt reacting an acid and a base to form a salt and observing the reaction products.	02
7.	Testing of soil acidity	02
8.	Studying the effect of temperature on the solubility of a solid in water at different temperatures to see how temperature affects solubility.	02
9.	Studying the properties of acids and bases: Students can test the properties of different acids and bases (e.g., pH, conductivity) and compare their properties.	04

10.	Investigating the reaction between an acid and a metal and measure the amount of gas produced.	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Textbook of Environmental Chemistry and Pollution Control	Dr. S. S. Dara, Dr. D.D. Mishra	S Chand & Co Ltd
Environmental Studies	Benny Joseph	Mc.Graw hill education Pvt. Ltd.
Environmental Studies	Dr. S.K. Dhameja	S.K. Kataria & Sons

Reference Book(s):

Title	Author/s	Publication
Engineering Chemistry	Jain & Jain	Dhanpat Rai Publishing company
Environmental Studies (From crisis to cure)	R. Rajagopalan	OXFORD university press

Web Material Link(s):

https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_ENS_LECTURE_NOTES_2.pdf

Course Evaluation:

Theory:

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

Practical:

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

Course Outcome(s):

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

SECH1110	Fundamental Chemistry & Environmental Science
CO 1	Develop a fundamental understanding of the principles and concepts of chemistry, including atomic structure, chemical reactions, and chemical bonding.
CO 2	Demonstrate an ability to apply chemical knowledge to real-world problems, such as calculating reaction yields and predicting chemical properties.
CO 3	Identify the types of pollution in society along with their sources.
CO 4	Realize the global environmental issues.

Mapping of CO with PO:

SECH1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	2	1	1			2			2		1
CO 2	1	1	2	3		1	2			1		1

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

Mapping of CO with PSO:

SECH1110	PSO1	PSO2	PSO3
CO 1	1	2	3
CO 2	3	1	1
CO 3	2		2
CO 4	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	Introduction to Chemistry	2,1
2	Chemical Thermodynamics and Kinetics	4, 5
3	Properties of Matter and Solutions	1,2
4	Organic Chemistry	4,5
5	Introduction to Environment	1,2
6	Environmental Pollution	1,2,3
7	Social Issues and Environment	1,2,3

P P Savani University
School of Engineering

Department of Mechanical Engineering

Course Code: SEME1120
Course Name: Fundamentals of Technical Drawing
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
00	04	--	04	--	--	40	60	--	--	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Know conventions and the methods of engineering drawing.
- Interpret engineering drawings using fundamental technical mathematics.
- Construct basic and intermediate geometry.
- Improve their visualization skills so that they can apply these skills in developing new products.
- Improve their technical communication skill in the form of communicative drawings.
- Comprehend the theory of projection.
- Basic knowledge of computer-aided drawing using AutoCAD.

Course Content:

Section I			
Module No.	Contents	Lab Hours	Weightage in %
1.	**Introduction:** Importance of the Course; Use of Drawing Instruments and accessories; BIS – SP – 46; Lettering, Dimensioning, and Lines; Representative Fraction; Types of Scales (Plain and Diagonal Scales); Construction of Polygons.	03	05
2.	**Engineering Curves:** Classification and Application of Engineering Curves; Construction of Conics, Cycloidal Curves, Involutes, Spiral, and Normal & Tangent to each curve.	12	15
3.	**Projections of points, lines & planes:** Types of Projections; Introduction of Principle Planes of Projections; Projection of Points in all four Quadrants; Projection of Lines inclined to one Referral Plane & two Referral Planes. True length and inclination with reference plane; Projection of Planes (Circular and Polygonal) with inclination to one Referral Plane and two Referral Planes; Concept of Auxiliary Projection Method.	15	30
Section II			

Module No.	Content	Hours	Weightage in %
4.	**Orthographic Projection and Isometric Projections** Types of Projections: Principle of First and Third Angle Projection Applications & Difference; Projection from Pictorial view of Object, View from Front, Top, and Sides; Full Section View. Isometric Scale, Conversion of Orthographic views into Isometric Projection, Isometric View, or Drawing of simple objects.	18	30
5.	**Residential Building Planning:** Introduction to buildings, Classification of buildings, Principles of building planning, Principles of architecture composition, Detail drawing, Line Plan, plan, elevation, section, Preparing working drawing of residential building.	06	10
6.	**Computer-Aided Drawing:** Introduction to AutoCAD, Basic commands for 2D drawing (Line, Circle, Polyline, Rectangle, Hatch, Fillet, Chamfer, Trim, Extend, Offset, Dim style, etc.)	06	10
	TOTAL	50	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction sheet (dimensioning methods, different types of lines,construction of various polygons, dividing the line and angle into parts, use of stencil, lettering), plane scale and diagonal scale	03
2.	Engineering curves	12
3.	Projection of points, lines & planes	15
4.	Orthographic projection	10
5.	Isometric projection	10
6.	Residential building drawing (Line plan, Plan, Elevation, Section, Schedule opening)	04
7.	Computer-Aided Drawing	06
	TOTAL	60

Text Book(s):

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

Reference Book(s):

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

Web Material Link(s):

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

Course Evaluation:

Practical:

- Continuous evaluation consists of performance of practical/tutorial which will be evaluated outof 20 marks for each practical/tutorial and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical test will consist of 30 marks and viva will consist of 30 marks during end semester exam.

Course Outcome(s):

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

SEME1120	FUNDAMENTALS OF TECHNICAL DRAWING
CO 1	Apply BIS standards of building planning and conventions while drawing Lines, printing Letters, and showing dimensions.
CO 2	Explore the various methods to draw various engineering curves and their applications.
CO 3	Classify the orthographic projection systems concerning the observer, object, and reference planes.
CO 4	Develop 3D Isometric views in relation to 2D orthographic views.
CO 5	Software application in engineering drawing.

Mapping of CO with PO:

SECH1120	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1	1	1				1			1	
CO 2	2		1	1	1			1			1	
CO 3	2		1	1				1			1	1
CO 4	2		1	2	1			1			1	1
CO 5	2	1	1	2	1			1			1	1

Mapping of CO with PSO:

SECH1120	PSO1	PSO2	PSO3
CO 1	1	2	2
CO 2	2	2	3
CO 3	2	3	1
CO 4	3	3	3
CO 5	3	3	3

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	1, 2, 6
2	Engineering Curves	2, 6
3	Projection of Points, Line & Plane	1, 2, 3, 4
4	Orthographic Projection	2, 5, 4
5	Isometric Projections and Isometric Drawing	2, 5, 4
6	Computer-Aided Drawing	2,3,6

P P Savani University

School of Engineering

Department of Civil Engineering

Course Code: SECV1110

Course Name: Core Engineering Concepts.

Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- Study the basic fundamentals of construction planning and material.
- Study significance of mechanical engineering systems in different fields of engineering.
- Study the basic concepts of electrical and electronics engineering.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Basics of Construction material and techniques** Common materials used in construction, Aggregate, Sand, Cement, Bricks, Timber, Steel, Paints. Bonds in brick masonry techniques, Foam works, Curing, Compaction of concrete, Water proofing, Fire safety norms and requirement.	08	18
2.	**Building planning and Bye laws** Building by laws as per national building code, building by laws as per local authority, standards for residential, public, commercial, industrial and institutional buildings planning, planning of earth quake resistance building, overview of RERA and ODPS, Green building and LEED certification, general layout, maps and plan used at construction site.	08	18
3.	**Basic Electricity Principles** Concept of Charge, Potential Difference and Current, Resistor, capacitor, Inductor, Ohm's law, effect of Temperature on resistance, temperature coefficient, Series and parallel combinations of Resistors and capacitors, Lenz and Faraday's laws for electromagnetic induction, AC Electricity and DC Electricity. **Electrical Wiring:** Different types of conductors and cables. Basics of wiring-Star and delta connection. Voltage drop and losses across cables and conductors.	07	14

Section II			
Module No.	Content	Hours	Weightage in %
4.	**Basics of I.C Engines:** Construction and working of 2 Stroke & 4 Stroke Petrol and Diesel Engines, Difference Between 2-Stroke - 4 Stroke Engine & Petrol-Diesel Engine, Efficiency of I. C. Engines.	08	18
5.	**Power Transmission Elements:** Construction and Applications of Couplings, Clutches and Brakes, Difference Between Clutch and Coupling, Types of Belt Drive and Gear Drive	08	18
6.	**DC Circuits and AC Circuits** DC Circuits: Introduction of Electrical circuit elements (prerequisites), voltage and current sources, Kirchoff's current and voltage laws, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits. AC Circuits: Representation of sinusoidal waveforms, peak and RMS values, Phasor representation of AC quantities, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), Series and parallel resonance. Three phase balanced circuits, voltage and current relations in star and delta connections, Power measurement in three phase circuits.	06	14
7.	**Basics of Steam Generators:** Introduction, Classification, Cochran, Lancashire and Babcock and Wilcox Boiler, Functioning of Different Mountings and Accessories	LAB	08
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Preparation of drawing sheet showing various bonds.	04
2.	Preparation of Basic plan of Construction site.	04
3.	Preparation sketch of various building component.	04
4.	Verify the series and parallel connections of resistors and capacitors.	04
5.	To understand construction and working of various types of boilers.	04
6.	To understand construction and working of mountings and accessories.	04
7.	To verify the Kirchoff's current and voltage laws and Network theorems.	02
8.	To understand construction and working 2 –stroke & 4 –stroke Petrol engines.	02
9.	To understand construction and working 2 –stroke & 4 –stroke Diesel engines.	02
	TOTAL	30

Text Book(s):

Title	Author(s)	Publication

Elements of Mechanical Engineering	Sadhu Singh	S. Chand Publications
Building construction	Dr. B C Punamia	Laxmi Publication
A text book in Electrical Technology	B L Theraja -	S Chand & Co.
Basic Electrical Engineering	D. C. Kulshreshtha	McGraw Hill, 2009

Reference Book(s):

Title	**Author(s)**	**Publication**
Basic Mechanical Engineering	T.S. Rajan	Wiley Eastern Ltd., 1996.
Town Planning	G. K. Hiraskar	Dhanpatrai Publications
Basic Electrical Engineering	Nagsarkar and Sukhija,	Oxford 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 of practical which will be evaluated out of 20 marks for each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/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:

SECV1110	**Core Engineering Concepts**
CO 1	Understand basic properties of various construction materials.
CO 2	Understand the general rules and regulation of building planning.
CO3	Apply the principles of basic mechanical engineering.
C04	Comprehend the importance of mechanical engineering equipments like IC engine and power transmission elements.
CO5	Understand working of various instruments and equipments used for the measurement of various electrical engineering parameters like voltage, current, power, phase etc in industry as well as in power generation, transmission and
CO6	Apply fundamental electrical laws and circuit theorems to electrical circuits.

Mapping of CO with PO:

SECH1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	3	3	1	2	1	2	1	1	2	1	1
CO 2	3	3	3	2	2	2	2	1	2	2	1	1
CO 3	3	2	2	2	2	2	2	1	2	2	2	1
CO 4	3	2	2	2	3	2	2	1	2	2	2	1
CO 5	3	3	3	2	3	2	2	1	2	2	2	1

Mapping of CO with PSO:

SECH1110	PSO1	PSO2	PSO3
CO 1	2	2	2
CO 2	2	3	2
CO 3	3	3	3
CO 4	3	2	3
CO 5	3	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	Basics of Construction material and techniques	1, 2, 3
2	Building planning and Bye laws	1, 2
3	Basic Electricity Principles	1,2,3
4	Power Transmission Elements	1, 2
5	Basics of I.C Engines	2
6	DC Circuits and AC Circuits	2,3,4
7	Basics of Steam Generators	1, 2

P P Savani University

School of Engineering

Course Code: CLSC2180

Course Name: Essentials of Entrepreneurship

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	--	--	2	100	--	--	--	--	--	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- To understand the basics of entrepreneurship and its traits
- To analyze the theory and models of entrepreneurships
- To evaluate different types and dimensions of entrepreneurship

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Entrepreneurship** Definition of Entrepreneurship, Entrepreneurship as a career choice, Benefits and Myths of Entrepreneurship, Characteristics, Qualities and Skills of an Entrepreneur, Model Traits of Entrepreneurs	07	30
2.	**Dimensions of Entrepreneurship** Entrepreneurship Theories, Intrapreneurship, Benefits of intrapreneurship, Difference between Entrepreneurs and Intrapreneurs Institutes for Entrepreneurship Development, sStartup Failures,	08	20
Section II			
Module No.	Content	Hours	Weightage in %
3.	**Women Entrepreneurship** Women Entrepreneurship Meaning, Factors that influence women Entrepreneurship, Barriers to Women Entrepreneurship, Qualities of Women Entrepreneurs, Success stories of Women Entrepreneurs Lijjat Papad Case study, Jassuben Pizza Case study	08	30
4.	**Social Entrepreneurship and emerging trends** Social Entrepreneurship, Functions of Social Entrepreneurship, Difference between Entrepreneurship and Social Entrepreneurship How does an NGO run?, Case Study on Social Entrepreneurship, Emerging trends in Entrepreneurship	07	20
	TOTAL	30	100

Text Book(s):

Title	Author/s	Publication
Entrepreneurship Business and Management	Dr. R C Bhatia	Sultan Chand and Sons

Reference Book(s):

Title	Author/s	Publication
Entrepreneurship	Trehan A	Dremtech

Web Material Link(s):

- https://www.startupindia.gov.in
- https://ediindia.ac.in
- https://www.ediindia.org

Theory:

- Continuous Evaluation consists of one test of 20 marks, 10 marks assignment, 10 marks presentation, 10 marks class participation and behavior.
- One live project of 50 marks

Course Outcome(s):

CLSC2070	Essentials of Entrepreneurship
CO 1	Students will be able to think of startup ideas
CO 2	Students will be able to apply the model of entrepreneurship practically
CO 3	Students will be able to further analyze other dimensions of Entrepreneurship

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 Entrepreneurship	1, 2, 3, 4, 5
2	Dimensions of Entrepreneurship	1, 2, 3, 4, 5
3	Women Entrepreneurship	1, 2, 3, 4, 6
4	Emerging Trends and Social Entrepreneurship	1, 2, 3, 4, 6

SECOND YEAR B. TECH.

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

TEACHING & EXAMINATION SCHEME FOR SECOND YEAR B.TECH. B.TECH. COMPUTER SCIENCE ENGINEERING – (CB) PROGRAMME AY: 2023-24

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	SESH2130	Discrete Structures & Graph Theory	Interdisciplinary	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SECE2210	Database Management System	Major/Core	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SECE2221	Data Structures	Major/Core	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SEIT2210	Object Oriented Programming with Java	Major/Core	IT	3	2	0	5	4	40	60	40	60	0	0	200
	SEIT2220	Software Engineering	Major/Core	IT	3	0	1	4	4	40	60	0	0	100	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	**28**	**25**							**1200**
4	SESH2140	Differential Equations & Statistics	Interdisciplinary	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SECE2231	Computer Organization	Major/Core	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SECE2240	Computer Networks	Major/Core	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SEIT2230	Operating System	Major/Core	IT	3	2	0	5	4	40	60	40	60	0	0	200
	SEIT2241	Mobile Application Development	Major/Core	IT	0	4	0	4	2	0	0	40	60	0	0	100
	CLSC2030	IPDC-II	VAC	CLSC	2	0	0	2	2	100	0	0	0	0	0	100
							Total	**26**	**21**							**1000**

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

Course Code: SESH2130
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:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Set, Relation & Function** Sets, Set operations, Introduction of Relations, Relations of Sets,Types of Relations, Properties of Relations, Equivalence Relation, Partial Ordering, Hasse Diagram, GLB & LUB, Functions, Classification of functions, Types of functions	08	17
2.	**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
3.	**Group Theory** Binary operations, Properties of Group, Groupoid, semigroup & monoid, Abelian group, Subgroup, Cosets, Normal subgroup, Lagrange's theorem, Cyclic group, Permutation group, Homomorphism & Isomorphism of groups.	08	17
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Mathematical Logic and Proof** Propositions, logical operators, Algebra of proposition,Predicates & quantifiers, Nested Quantifiers, Rules of Inference, Proof Methods, Program Correctness techniques.	06	14
5.	**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
6.	**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	2
6.	Problems based on Group Theory-2	4
7.	Problems based on Mathematical Logic and Proof	2
8.	Problems based on Graph Theory-1	2
9.	Problems based on Graph Theory-2	2
10.	Problems based on Graph Theory-3	4
11.	Problems based on Tree-1	2
12.	Problems based on Tree-2	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/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 50 marks.
- Assignment consists of 20 marks.
- Internal viva consists of 30 marks.

Course Outcome(s):

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

SESH2130	DISCRETE STRUCTURES & GRAPH THEORY
CO 1	Summarize the concepts of set theory for understanding & fetching data from a database using query.
CO 2	Classify the basic concepts of spanning tree algorithms namely DFA, BFS, prim's and Kruskal's in the design of networks.
CO 3	Construct the algorithm of group theory for data encryption.
CO 4	Combine the design, foundational concepts of notations and results of graph theory used for better understanding of problems.

Mapping of CO with PO

SESH2130	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	2	2	1	1								1
CO 2	3	3	1	1								3
CO 3	2	2	1	1								1
CO 4	3	3	1	1								3

Mapping of CO with PSO

SESH2130	PSO1	PSO2	PSO3
CO 1	1	2	
CO 2	2	2	
CO 3	1	1	
CO 4	3	1	2

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Set, Relation & Function	1,2,4,6
2.	Lattices	1,2,3,4,6
3.	Group Theory	1,2,3,5,6
4.	Mathematical Logic and Proof	1,2,3,4,6
5.	Graph Theory	1,2,3,5,6
6.	Tree	1,2,3,5,6

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE2210
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:

Section I			
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** 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, Built-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	12	25
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Relational Model** Structure of relational databases, Domains, Relations, Relational algebra: fundamental operators and syntax, inner join, outer join, relational algebra queries	05	12
5.	**Normalization** Functional Dependency: Definition, trivial and non-trivial FD, closure of attributes, closure of FD set, irreducible set of FD, Decomposition	07	15

	using FD, dependency preservation, Database design anomalies, Normalization: 1NF, 2NF, 3NF, BCNF, Multi- valued dependency, 4NF.		
6.	**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
7.	**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

SECE2210	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.

Mapping of CO with PO

SECE2210	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	2	1	1	1								
CO 2	2	1	1	1								
CO 3	2	1		1								
CO 4	2	1	1	1								

Mapping of CO with PSO

SECE2210	PSO1	PSO2	PSO3
CO 1	2	1	2
CO 2	2	1	2
CO 3	2	1	2
CO 4	3	2	2

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Introduction to DBMS	1,2
2.	Entity-Relationship model	1,2,3
3.	SQL Concepts	4,6
4.	Relational Model	3,4
5.	Normalization	2,3
6.	Transaction Management	2,3,4
7.	Basic of PL/SQL	2,4,6

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE2221
Course Name: Data Structures
Prerequisite Course(s): Introduction to Computer Programming (SECE1020)

Teaching & Examination Scheme:

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

Section I			
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.	03	05
Section II			
Module No.	Content	Hours	Weightage in %
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** Graph Definition, Concepts, and Representation, Types of Graphs, Tree Definition, concepts, and Representation. Binary Tree, Binary Tree Traversals, conversion from general to Binary Tree. Threaded	12	25

	Binary Tree, Heap, Binary Search Tree. Tree for Huffman coding, Breadth First Search, Depth First Search, Spanning Tree, Kruskal's and 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
9.	**Advanced Search Structures** AVL Trees. 2-3 Trees. 2-3-4 Trees. Red-Black Trees. B-Trees. B+ Tree Splay Trees. Digital Search Trees. Tries.	04	07
	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 finding the sum of 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

SECE2221	**DATA STRUCTURES**
CO 1	Differentiate primitive and non-primitive data structures.
CO 2	Understand the concept of dynamic memory management.
CO 3	Apply algorithm for solving problems like sorting, searching, insertion and deletion of data.
CO 4	Describe the hash function and concepts of collision and its resolution methods.

Mapping of CO with PO

SECE2221	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1		2								
CO 2	2	1		1							1	
CO 3	2	2		2	1	2						
CO 4	2	1		2			1				1	

Mapping of CO with PSO:

SECE2221	PSO1	PSO2	PSO3
CO 1		1	
CO 2	2	1	2
CO 3	2	1	1
CO 4	2	2	2

Level of Revised Bloom's Taxonomy in Assessment:

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

Module No	**Content**	**RBT Level**
1.	Introduction to Data Structures	1,2,4
2.	Array	1,2,3
3.	Searching and Sorting	2,4,5
4.	Stack and Queue	1,2,3,4
5.	Linked List-Part I	1,2,3
6.	Linked List-II and Applications of Linked List	2,3,6
7.	Trees and Graphs	2,3,4
8.	Hashing	2,3,4
9.	Advanced Search Structures	2,3,4

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SEIT2210
Course Name: Object Oriented Programming with Java
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	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 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:

Section I			
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	06
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	17
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	17
Section II			
Module No.	Content	Hours	Weightage in %
5.	**Exceptions Handling:** Exception types, Try…Catch…Finally, Throw, Throws, creating your own exception subclasses.	06	14
6.	**Multithreaded Programming:** Life cycle of thread, thread methods, thread priority, thread	08	18

	exceptions, Implementing Runnable interface, Synchronization.		
7.	**GUI Programming & Lambdas and Streams:** Introduction to Annotation, Byte streams and character streams, Wrapper classes, Why Lambda Expression, Lambda Expression Syntax, where to use lambda expression, Adopting Patterns like matching, finding and filtering, Swing overview, Swing component classes: AbstractButton, ButtonGroup, ImageIcon, JApplet, Jbutton, JcheckBox, JcomboBox, Jlabel, JradioButton, JscrollPane, JtabbedPane, Jtable, JtextField, Jtree.	09	18
	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	04
14.	Implementation of Java AWT programs to Create Registration Form	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Java The Complete Reference	Herbert Schildt	McGraw Hill

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

SEIT2210	**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

SEIT2210	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	PO11	PO12
CO 1	2	3	3									
CO 2	3	2	3	2	1							
CO 3		2	2	3	2						1	1
CO 4	1	1	1	1	3						2	2
CO 5	1	1	1	2	3			1			2	1

Mapping of CO with PSO

SEIT2210	PSO1	PSO2	PSO3
CO 1			1
CO 2	1	3	
CO 3			1
CO 4	3		
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.	Fundamental of Object-Oriented Programming	1,2
2.	Class Fundamentals	1,2
3.	Array & String Handling	3,4
4.	Inheritance, Interfaces & Packages	2,3,4

5.	Exceptions Handling	2,3
6.	Multithreaded Programming	2,3
7.	GUI Programming & Lambdas and Streams	2,3,4

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SEIT2220
Course Name: Software Engineering
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	--	01	04	40	60	--	--	100	--	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Study the pioneer of Software Development Life Cycle, Development models, and Agile Software Development.
- Study fundamental concepts in software testing, including software testing objectives, processes, criteria, strategies, and methods.
- Discuss various software testing issues and solutions in software unit tests; integration, regression, and system testing.
- Learn the process of improving the quality of software work products.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Software and Software Engineering** The Evolving Role of Software, A Crisis on the Horizon and Software Myths, Layered Technologies, Processes, Methods and Tools, Generic View of Software Engineering, Study of Different Models-Waterfall model, Incremental model, Evolutionary process models- Prototype, Spiral, and RAD model.	06	15
2.	**Agile Development** Agility and Agile Process model, Extreme Programming, Other process models of Agile Development and Tools.	04	10
3.	**Requirement Analysis and Specification** Problem Recognition, Understanding the Requirement, Requirement Modelling, Requirement Specification (SRS), Requirement Analysis and Requirement Elicitation, Requirement Engineering.	05	10
4.	**Structured Software Design** Design Concepts, Design Model, Software Architecture, Data Design, Architectural Design, Component Level Design (Function Oriented Design, Object Oriented Design), User Interface Design, Web Application Design.	08	20
Section II			
Module No.	Content	Hours	Weightage in %
5.	**Software Coding & Testing** Programming principles, Coding Standards and coding Guidelines, Unit testing; Metrics, Software testing fundamentals, Black-box and white box testing, Basis path testing, Control structure testing, Black-box testing - Graph-	08	20

	based testing method, Boundary value analysis; Testing strategies - A strategic approach to software testing, Test strategies for conventional and object-oriented software, test case generation and tool support, Metrics – Coverage analysis-reliability.		
6.	**Quality Assurance** Quality Control, Assurance, Cost, Reviews, Software Quality Assurance, Approaches to SQA, Reliability, Quality Standards-ISO9000 and 9001.	04	08
7.	**Software Project Management** Scope and Feasibility, Effort Estimation, Schedule and staffing, Quality Planning, Risk management- identification, assessment, control, project monitoring plan, Detailed Scheduling. Six Sigma for SE, Management Spectrum, People –Product – Process- Project, W5HH Principle, Importance of Team Management.	06	10
8.	**Software Maintenance and Configuration Management** Types of Software Maintenance, Re-Engineering, Reverse Engineering, Forward Engineering, The SCM Process, Identification of Objects in the Software Configuration, Version Control and Change Control.	04	07
	TOTAL	45	100

List of Tutorials:

Sr. No.	Name of Tutorial	Hours
1.	To select the project title and apply requirement engineering to it.	01
2.	To perform the system analysis: Requirement analysis, SRS.	01
3.	To perform the function-oriented diagram: DFD and Structured chart.	01
4.	To perform the user's view analysis: Use case diagram.	01
5.	To draw the structural view diagram: Class diagram.	01
6.	To draw the behavioral view diagram: Sequence diagram, Activity diagram.	02
7.	To study various testing tools.	01
8.	To design test cases.	01
9.	To study cost estimation and preparation of timeline chart.	01
10.	To study the different types of performance testing.	01
11.	To study the usage of regression testing.	01
12.	To understand the usage of software metrics.	01
13.	Project Work: Understand the importance of the SDLC approach & various processes.	02
	TOTAL	15

Text Book(s):

Title	Author/s	Publication
Fundamentals of Software Engineering	Fundamentals of Software Engineering	Fundamentals of Software Engineering
Rajib Mall	Rajib Mall	Rajib Mall

Reference Book(s):

Title	Author(s)	Publication
Software Engineering – An Engineering Approach	James F. Peters & Witold Pedrycz	Wiley
Software Engineering	IAN Sommerville	Pearson Education

Web Material Link(s):

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

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 practical performance which should be evaluated out of 10 for each Tutorial and the average will be converted to 50 marks.
- Internal viva consists of 50 marks.

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

SEIT2220	**Software Engineering**
CO 1	Cite the process of requirement gathering, classification, specification, and validation in the software engineering process.
CO 2	Demonstrate an ability to design the software by applying the software engineering design principles.
CO 3	Discover system design patterns, and agile methodologies for the development of software using UML and Scrum.
CO 4	Devise project planning, cost estimation, and quality management techniques.
CO 5	Assess the software testing process to analyze the functionality of the application.

Mapping of CO with PO

SEIT2220	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	2	1	2				1					
CO 2	2	2	2		1		2				3	3
CO 3	2	2	2		1		2				3	3
CO 4	2	1	1		1		2				2	3
CO 5	2	1	1		1		2				3	3

Mapping of CO with PSO

SEIT2220	PSO1	PSO2	PSO3
CO 1			2
CO 2	1		2
CO 3	1		2
CO 4	1		2
CO 5	1	1	2

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	**Content**	**RBT Level**
1.	Introduction to Software and Software Engineering	1,2
2.	Agile Development	2,3
3.	Requirement Analysis and Specification	2,3,4
4.	Structured Software Design	2,3,6
5.	Software Coding & Testing	2,3,4
6.	Quality Assurance	1,2
7.	Software Project Management	2,3,4

8.	Software Maintenance and Configuration Management	2,3,4

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

Course Code: SESH2140
Course Name: Differential Equations & Statistics
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	--	02	05	40	60	--	--	100	--	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- recall existing knowledge of calculus and apply it for solving engineering problems involving differential equations.
- introduce partial differential equations with different methods of solution.
- understand periodic functions expressed as a Fourier series and applications of Fourier series to odes.
- introduce the basic statistical data analysis and probability distribution.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Ordinary Differential Equation-I** First order ODEs, Formation of differential equations, Solution of differential equation, Solution of equations in separable form, Exact first order ODEs, Linear first order ODEs, Bernoulli Equation **Ordinary Differential Equation-II** ODEs of Second and Higher order, Homogeneous linear ODEs, Linear Dependence and Independence of Solutions, Homogeneous linear ODEs with constant coefficients, Nonhomogeneous ODEs, Variation of Parameters.	10	20
2.	**Partial Differential Equation** Formation of First and Second order equations, Solution of First order equations, Linear and Non-liner equations of first, Higher order equations with constant coefficients, Complementary function, Particular Integrals.	07	18
3.	**Fourier Series** Periodic function, Euler Formula, Arbitrary Period, Even and Odd function, Half-Range Expansions	05	12
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Basics of Statistics** Elements, Variables, Observations, Quantitative and Qualitative data, Cross-sectional and Time series data, Frequency distribution, Dot plot, Histogram, Cumulative distribution, Measure of location, Mean, Median, Mode, Percentile, Quartile, Measure of variability, Range, Interquartile Range, Variance, Standard Deviation, Coefficient of Variation.	07	15

5.	**Correlation & Regression Analysis** Regression Analysis, Regression line and regression coefficient, Karl Pearson's method.	07	15
6.	**Probability Distribution** Introduction, Conditional probability, independent events, independent experiments, Theorem of total probability and Bayes' theorem, Probability distribution, Binomial distribution, Poisson distribution, Normal distribution, Hypothesis.	09	20
	TOTAL	45	100

List of Tutorial(s):

Sr. No.	Name of Tutorial	Hours
1.	Ordinary Differential Equation-1	02
2.	Ordinary Differential Equation-2	02
3.	Ordinary Differential Equation-3	04
4.	Partial Differential Equation-1	02
5.	Partial Differential Equation-2	04
6.	Fourier Series-1	02
7.	Fourier Series-2	02
8.	Basics of Statistics-1	02
9.	Basics of Statistics-2	02
10.	Correlation & Regression Analysis	02
11.	Probability-1	02
12.	Probability-2	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Advanced Engineering Mathematics	Erwin Kreyszig	Wiley India Pvt. Ltd. New Delhi.
Probability and Statistics for Engineers	Richard A. Johnson Irwin Miller, John Freund	Pearson India Education Services Pvt. Ltd., Noida.

Reference Book(s):

Title	Author(s)	Publication
Higher Engineering Mathematics	B. S. Grewal	Khanna Publishers, New Delhi
Advanced Engineering Mathematics	R. K. Jain S.R.K. Iyengar	Narosa Publishing House New Delhi.
Differential Equations for Dummies	Steven Holzner	Wiley India Pvt. Ltd., New Delhi.
Higher Engineering Mathematics	H.K. Dass Er. Rajnish Verma	S. Chand & Company Ltd., New Delhi.

Web Material Link(s):

- http://nptel.ac.in/courses/111105035/
- http://nptel.ac.in/courses/111106100/
- http://nptel.ac.in/courses/111105093/
- http://nptel.ac.in/courses/111108081/
- http://nptel.ac.in/courses/111105041/1

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 per each tutorial and average of the same will be converted to 50 marks.
- Assignment consists of 20 marks.
- Internal viva consists of 30 marks.

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

SESH2140	DIFFERENTIAL EQUATIONS & STATISTICS
CO 1	Describe 1st and 2nd order ODEs and PDEs.
CO 2	Classify differential equations and evaluate linear & non-linear partial differential equations.
CO 3	Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field theory.
CO 4	Elaborate analysis of categorial data and quantitative data.
CO 5	Adapt the knowledge of various probability distribution and their applications in mathematical models, sport strategies and insurance.

Mapping of CO with PO

SESH2140	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	3	2	1									3
CO 2	3	2	1									3
CO 3	3	2	1									3
CO 4	2	1	1									1
CO 5	2	1	1									1

Mapping of CO with PSO

SESH2140	PSO1	PSO2	PSO3
CO 1	2	1	
CO 2	2	1	
CO 3	2	1	
CO 4	2		1
CO 5	1		

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Ordinary Differential Equation	1, 2, 3, 5
2.	Partial Differential Equation	1, 2, 4, 5
3.	Laplace Transform	1, 2, 4, 5
4.	Fourier Series & Fourier Integral	1, 2, 3, 4, 5
5.	Basics of Statistics	1, 2, 3, 4, 5
6.	Probability Distribution	1, 2, 3, 4, 5

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE2231
Course Name: Computer Organization
Prerequisite Course(s): NIL

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 comprehensive knowledge of overall basic computer hardware structures.
- learn architectures of various internal and external input output systems.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Basic Computer Organization and Design** 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 andDivision 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
Section II			
Module No.	Content	Hours	Weightage in %

5.	**Pipeline Control and Parallel Processing** Flynn's taxonomy, Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction, Pipeline Hazards, Pipeline Performance, RISC Pipeline.	08	20
6.	**Input-Output Organization** Types of Peripherals, Input-Output Interface, Asynchronous Data Transfer, Modes ofTransfer, Priority Interrupt, DMA	06	15
7.	**Memory Organization** Memory Hierarchy, Main Memory, Auxiliary Memory,Associative Memory, Cache Memory, Virtual Memory.	08	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.	14
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Computer System Architecture	M. Morris Mano	Pearson
Structured Computer Organization, 6th Edition	Andrew S. Tanenbaum and Todd Austin	PHI

Reference Book(s):

Title	Author/s	Publication
Computer Architecture & Organization	M. Murdocca & V. Heuring	WILEY
Computer Architecture and Organization	John Hayes	McGrawHill

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, whichwill 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 should be evaluated outof 10 marks per each practical and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks 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 student will be able to

SECE2231	COMPUTER ORGANIZATION
CO 1	Describe the design and working of basic components used to build computer system.
CO 2	Visualize and understand the working of cpu, different instruction formats, addressing modes, pipeline and vector processing and evaluate the performance of pipeline approach.
CO 3	Describe the requirements of different memories and evaluate memory management techniques.
CO 4	Examine the working mechanism of input and output devices and information transfer.

Mapping of CO with PO

SECE2231	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	3	3	1	1								1
CO 2	3	2	1									1
CO 3	3	2	1	1								
CO 4	3	2	1									1

Mapping of CO with PSO

SECE2231	PSO1	PSO2	PSO3
CO 1	2	1	2
CO 2	2	1	2
CO 3	2	1	2
CO 4	3	2	2

Level of 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	2,4
2	Programming the Basic Computer	2,3,4
3	Computer Arithmetic	2,4.5
4	Central Processing Unit	1,2,5
5	Micro-programmed Control	1,2
6	Pipeline and Vector Processing	2,5
7	Input-Output Organization	2,3,4
8	Memory Organization	2,5,6
9	Multiprocessors	2

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE2240
Course Name: Computer Networks
Prerequisite Course(s): Discrete Mathematics, Data and File Structures

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:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Overview of network and data communication, types of Networks, Network Topology, Protocol hierarchies, and design issues of layers Interfaces, and services. Reference Model: The OSI reference model, TCP/IP reference model, network standards**.**	04	10
2.	**Physical Layer** Transmission media, Data and transmission techniques, Multiplexing, Asynchronous Communication, Wireless transmission, ISDN, ATM, Cellular Radio, Switching techniques issues.	07	15
3.	**Data Link Layer** Layer design issues, services provided to network layers, Framing, Error control, and Flow control, Data link control and protocols – Simplex protocol, sliding window protocol, Utopia, Stop N Wait, Automatic Repeat Request. Go Back N, Selective Repeat Protocols.	07	15
4.	**Medium Access Sub Layer** Channel Allocations, Multiple Access protocols- ALOHA, CSMA, CSMA/CD protocols, Collision-free protocols, Limited contention protocols, LAN architectures, IEEE 802 and OSI, Ethernet (CSMA/CD), Bus, Token Ring, DQDB, FDDI, Bridges and recent developments.	05	10
Section II			
Module No.	Content	Hours	Weightage in %
5.	**Network Layer** A network Layer design issue, Routing algorithms, and protocols – OSPF, BGP, RIP, Congestion Control Algorithms, Internetworking – IPV4 & IPV6, Addressing, N/W Layer Protocols, and subnets.	09	20
6.	**Transport Layer** Transport services, Design issues, transport layer protocols – TCP & UDP, Congestion Control, QOS and its improvement.	07	15

7.	**Application Layer** Client-Server Model, WWW, HTTP, DNS, DHCP, FTP, and Email Protocol – IMAP, POP3, SMTP	06	15
	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

SECE2240	COMPUTER NETWORKS
CO 1	Distinguish the working of network protocols, application and OSI reference model and TCP/IP reference model.
CO 2	Comprehend functionality of various protocols and algorithms with various architecture layer.
CO 3	Design computer network configuration.
CO 4	Recognize the technological trends of Computer Networking

Mapping of CO with PO

SECE2240	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	2	1	1	1	2							1
CO 2	3	1	1	2	1					1	1	1
CO 3	2	2	2		1					1		
CO 4		2	2	1	1	2	2	1	1	1		1

Mapping of CO with PSO

SECE2240	PSO1	PSO2	PSO3
CO 1	1	1	
CO 2	2	2	1
CO 3	1	1	
CO 4	2		2

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Introduction	2,4
2.	Physical Layer	1,2,4
3.	Datalink Layer	2,4
4.	Medium Access Layer	1,2
5.	Network Layer	2,3,5,6
6.	Transport Layer	2,4
7.	Application Layer	2,5

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SEIT2230
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

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

Course Content:

Section I			
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, Preemptive and Non- Preemptive Scheduling, Scheduling Criteria, Process Scheduling Algorithms: FCFS, SJF, Priority, Round- Robin, Multilevel Queue, and Lottery Scheduling; Threads, Types of Threads, Multithreading	09	20
3.	**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
4.	**Deadlocks** Resources, Conditions for Deadlocks, Deadlock Modelling, , Deadlock Detection and Recovery, Deadlock Avoidance, Deadlock Prevention.	04	08
Section II			
5.	**Memory Management** Main memory: Background, Swapping, Contiguous Memory Allocation, Segmentation, Paging: Introduction to Paging, Translation look-aside buffer (TLB), Structure of Page Table, Virtual memory: Background, Demand Paging, Page Replacement Algorithms: FIFO, Optimal Page Replacement, Least Recently Used, Not Recently Used, Second Chance Page Replacement, Thrashing.	11	25
6.	**File Management** File Concepts: File Types, File Attributes, File Access Methods, File Operations, Directories: Directories Structure, Path Types, Directory Operations; File Allocation Methods: Contiguous, Linked, Indexed	05	12

	Allocation.		
7.	**Disk Management** Disk structure, Disk Scheduling Algorithms: FCFS, SSTF, SCAN, C-SCAN, LOOK, C-LOOK, Disk Free Space Management, RAID Levels.	06	13
	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
Operating System Principles	Silberschatz A., Galvin P. and Gagne G	Wiley
Modern Operating System	Andrew S. Tanenbaum	Pearson

Reference Book(s):

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

Web Material Link(s):

https://nptel.ac.in/courses/106106144

Course Evaluation:

Theory:

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

Practical:

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

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

SEIT2230	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	2	0	0	1	3	2	0	0	0	0	0	2
CO 2	2	2	0	3	2	0	1	0	0	0	0	2
CO 3	2	2	0	2	1	0	1	0	0	0	0	1
CO 4	1	2	0	1	1	2	0	0	0	0	0	2

Mapping of CO with PSO

SEIT2230	PSO1	PSO2	PSO3
CO 1	0	0	0
CO 2	2	1	1
CO 3	1	1	1
CO 4	0	2	0

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, 5, 6
3.	Inter Process Communication	2, 3, 4, 5
4.	Deadlock	2, 3, 4, 6
5.	Memory Management	1, 2, 3, 4, 6
6.	File Management	1, 2, 3
7.	Disk Management	1, 2, 3, 4, 5

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT2241
Course Name: Mobile Application Development
Prerequisite Course(s): -- Object Oriented Programming with Java (SEIT2010)

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
--	04	00	02	--	--	40	60	--	--	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Understand life cycle of an application/activity.
- Learn design of responsive mobile applications.
- Develop mobile application using open-source technologies.

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Create Hello World Application.	02
2.	Create an application to perform addition, subtraction, multiplication, division operation on given two numbers entered by user.	02
3.	Create an application to convert temperature from Fahrenheit to Celsius.	02
4.	Create a login application to validate Email ID and Password. Display Toast Message on successful login or error message if not login.	04
5.	Create an application UI component: Image Button, Toggle button, Progress Bar, Spinner, Date Picker, Time Picker, Seek Bar , Switch, Rating Bar.	08
6.	Create an application that will change color of the screen, based on selected options from the menu.	04
7.	Create an UI such that, one screen have list of all friends. On selecting of any name, next screen should show details of that friend like Name, Image, Interest, Contact details etc.	04
8.	Create an android app to draw red color circle & blue color rectangle using paint & canvas class.	04
9.	Create an app to send SMS and email.	06
10.	Create an application that will play a media file from the memory card.	04
11.	Create application using Google speech API.	06
12.	Create an application to make Insert, Update, and Delete operation on the database.	04
13.	Android Studio Setup for flutter Development	04
14.	Create an application to demonstrate Dialogs & Expansion tile card in a flutter	06
	TOTAL	60

Text Book(s):

Title	Author/s	Publication
Introduction to Android Application Development	Joseph Annuzzi Jr., Lauren Darcey, Shane Conder	Pearson Education
Beginning Android 4 Application Development	Wei Meng Lee	Wrox

Reference Book(s):

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

Web Material Link(s):

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

Course Evaluation:

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

SEIT2241	MOBILE APPLICATION DEVELOPMENT
CO 1	Develop user friendly mobile applications by implementing different practicals.
CO 2	Understand the concepts of front-end development using various technologies
CO 3	Analyze and implement frameworks, database and design patterns in mobile applications.
CO 4	Create a small but realistic working mobile application using different application programming interface.

Mapping of CO with PO

SEIT2241	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	2	1	1	3	2			1	2	1	1
CO 2	2	1	2	2	3	2			1	1	1	2
CO 3	0	2	3	2	3	2			1	2	2	3
CO 4	3	3	3	2	3	3			3	3	3	3

Mapping of CO with PSO

SEIT2241	PSO1	PSO2	PSO3
CO 1	2	1	1
CO 2	2	3	1
CO 3	3	3	3
CO 4	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

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

Practical No	Content	RBT Level
1.	Introduction of Android	1,2,3
2.	Android Application Design and Resource	2,3,4
3.	Exploring User Interface Screen Elements	2,3,4
4.	Designing User Interfaces with Layouts	2,3,6
5.	Working with Widgets & Control	2,4,5,6
6.	Drawing & Working with Animation	3,4,6

7.	Designing Application , Working with Android Manifest file	2,6
8.	Canvas & Paint Class, Multimedia APIs.	1,2,6
9.	Networking APIs, Android Web APIs.	1,2,5,6
10.	Working with Media Controller.	2,3
11.	Working with Speech to Text & Text to Speech.	3,6
12.	Storage APIs, Working with Database.	4,3,6
13.	Cross Platform Mobile Application using flutter.	2,3
14.	Demonstrate UI Components in flutter	2,3,6

THREE YEAR B. TECH.

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

TEACHING & EXAMINATION SCHEME FOR THIRD YEAR B. TECH. BATCH : 2023 COMPUTER SCIENCE ENGINEERING (CYBER SECURITY)

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	
5	SECE3250	Cybersecurity Foundation	Major/Core	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SECE3260	Cryptography Fundamentals	Major/Core	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SECE3271	Network Security	Major/Core	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SEIT3270	Web Technologies	Major/Core	IT	3	2	0	5	4	40	60	40	60	0	0	200
		Elective-I	Minor		2	2	0	4	3	40	60	40	60	0	0	200
		Language Training Elective Course	AEC	CFLS	3	0	0	3	3	100	0	0	0	0	0	100
		Life Skill Elective Course-I	VAC	CLSC	2	0	0	2	2	100	0	0	0	0	0	100
	SECE3920	Summer Training	Minor	CE	0	4	0	0	4	0	0	100	0	0	0	100
							Total	**29**	**28**							**1300**
6	SECE3221	Internet of Things	Major/Core	CE	2	4	0	6	4	40	60	40	60	0	0	200
	SECE3231	Cloud Computing & Applications	Major/Core	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SEIT3281	Cyber Forensic and Investigation	Major/Core	IT	2	2	0	4	3	40	60	40	60	0	0	200
	SECE3560	Project-I	Minor	CE	0	3	0	3	3	0	0	100	0	0	0	100
		Elective-II	Minor		2	2	0	4	3	40	60	40	60	0	0	200
	TNPC3010	Corporate Grooming & Etiquette	SEC	TNPC	3	0	0	3	3	100	0	0	0	0	0	100
	SECE3490	MOOC Course / University Elective	SEC		3	0	0	3	3	100	0	0	0	0	0	100
		Life Skill Elective Course-II	VAC	CLSC	2	0	0	2	2	100	0	0	0	0	0	100
							Total	**30**	**25**							**1200**

P P SAVANI UNIVERSITY																
SCHOOL OF ENGINEERING																
TEACHING & EXAMINATION SCHEME FOR THIRD YEAR B. TECH. BATCH : 2023 COMPUTER SCIENCE ENGINEERING – ELECTIVE COURSES																
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**	
5	SECE3630	Wireless Network & Mobile Computing	Minor	IT	2	2	0	4	3	40	60	40	60	0	0	200
	SEIT3660	Web Security	Minor	IT	2	2	0	4	3	40	60	40	60	0	0	200
	SEIT3670	Application Security	Minor	IT	2	2	0	4	3	40	60	40	60	0	0	200
6	SECE3660	Image Processing & Steganography	Minor	CE	2	2	0	4	3	40	60	40	60	0	0	200
	SEIT3640	Advanced Web Technologies	Minor	IT	2	2	0	4	3	40	60	40	60	0	0	200
	SEIT3650	Augmented Reality & Virtual Reality	Minor	IT	2	2	0	4	3	40	60	40	60	0	0	200
	SEIT3680	Disaster Recovery and Business Continuity Management	Minor	IT	2	2	0	4	3	40	60	40	60	0	0	200

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3250
Course Name: Cybersecurity Foundation
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

- To understand key terms and concepts in Cyber security, Policies, Governance and Compliance.
- To exhibit knowledge to secure corrupted systems, protect personal data, and secure computer networks in an Organization.
- To understand principles of cyber security and to guarantee a secure network by analyzing the nature of attacks through cyber forensics software or tools.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Cyber Security:** Cyber Security- Layers of security, Vulnerability, Assets and Threat, Challenges and Constraints - Computer Criminals - CIA Triad - Motive of attackers - Spectrum of attacks - Taxonomy of various attacks – Cryptography - Security Governance – Challenges and Constraints, Security Models and Risk Management.	06	15
2.	**Vulnerabilities and Safeguards:** Software Vulnerabilities - Open Access to Organizational Data, Weak Authentication, poor cyber security awareness - Cyber Security Safeguards – Overview, Access control, Audit, Authentication, Biometrics, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Scanning, Security policy, Threat Management, Defending malicious software, Applying software update and patches.	08	20
3.	**Cyber Security Tools:** Zenmap – Hydra –Kismet – NMAP –NETCAT -John the Ripper – Aircrack-ng – EvilOSX- IP Table.	08	15
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Cyber Security Strategies:** Need for building cyber strategy – Cyber-attack strategies (Red team) – Cyber defense strategies (blue team) – Introduction to Cyber security kill chain – Reconnaissance – Weaponization – Privilege Escalation - Exfiltration - Threat Life cycle management phases.	05	15
5.	**Cybercrime Challenges:** Challenges of fighting cybercrime- Opportunities, general challenges, and legal challenges - Capacity building- Cyber security and	08	15

	cybercrime: Capacity building methodology, Strategy as a starting point, the relevance of policy, the role of regulators in fighting cybercrime, high standards in developing countries.		
6.	**Network Defense:** Firewall Basics, Packet Filter Vs Firewall, Firewall Protects a Network, Packet Characteristic to Filter, Stateless Vs Stateful Firewalls, Network Address Translation(NAT) and Port Forwarding, Basic of Virtual Private Networks, Linux Firewall, Windows Firewall, Snort: Intrusion Detection System.	10	20
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Implementation to gather information from any PC's connected to the LAN using who is, port scanners, network scanning, Angry IP scanners etc.	04
2.	Experiments with open source firewall/proxy packages like IP tables.	04
3.	Implementation of Steganography.	02
4.	Implementation of Windows security using firewalls and other tools.	04
5.	Use a tool like Hashcat to crack a weak password hash and demonstrate how attackers can use brute force to break weak passwords.	04
6.	Use N map to scan a local network and identify open ports, services, and potential vulnerabilities.	04
7.	Generating SSL/TLS certificates and setting up a simple web server with HTTPS.	04
8.	Simulate phishing emails and set up landing pages to capture credentials.	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Cyber security - Attack and Defense Strategies	Yuri Diogenes, Erdal Ozkaya	Packt Publishers, 2018.
Cybersecurity Essentials	Charles J. Brooks, Christopher Grow, Philip A. Craig, Donald Short	Wiley Publisher, 2018.

Reference Book(s):

Title	Author(s)	Publication
Understanding cybercrimes, Computer Forensics and Legal Perspectives	Nina Godbole, Sunit Belapure	Wiley, 2011.
Effective Cybersecurity: A Guide to Using Best Practices and Standards,	William Stallings	1st edition, 2019.

Web Material Link(s):
https://www.coursera.org/learn/introduction-to-cybersecurity-fundamentals
https://bundles.yourlearning.ibm.com/skills/cybersecurity-fundamentals/

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

SECE3250	CYBERSECURITY FOUNDATION
CO 1	Analyze and evaluate the cyber security needs of an organization.
CO 2	Analyze the security issues in networks and computer systems to secure an infrastructure.
CO 3	Design operational cyber security strategies and policies.
CO 4	Apply critical thinking and problem-solving skills to detect current and future attacks on an organization's computer systems and networks.

Mapping of CO with PO

SECE3250	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	3	3		1								1
CO 2	3	2		3	2							
CO 3	3		1		3	2	2	3			2	
CO 4		2		2	2				1	3		

Mapping of CO with PSO

SECE3250	PSO1	PSO2	PSO3
CO 1	3	3	2
CO 2	3	3	3
CO 3	2	2	3
CO 4	3	3	2

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Introduction to Cyber Security.	2,3,4,5
2.	Vulnerabilities and Safeguards.	3,4,5
3.	Cyber Security Tools.	3,4
4.	Cyber Security Strategies.	1,4,5
5.	Cybercrime Challenges.	4,5,6
6.	Network Defense.	3,4,5

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3260
Course Name: Cryptography Fundamentals
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 cryptography theories, algorithms and systems.
- understand necessary approaches and techniques to build protection mechanisms in order to secure computer networks.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Cryptography:** Basic Concepts: Plaintext, Ciphertext, Encryption, Decryption, Symmetric and Asymmetric Key Cryptography, Cryptographic Algorithms: Basic Terminology and Techniques.	05	05
2.	**Classical Cryptography Techniques:** Substitution Ciphers: Caesar cipher, Vigenère cipher, Transposition Ciphers: Rail Fence cipher, One-Time Pad (OTP), Polyalphabetic Ciphers, PlayFair and Hill Ciphers.	08	15
3.	**Modern Cryptographic Algorithms:** Symmetric Key Algorithms: DES, AES, and their strengths and weaknesses, Asymmetric Key Algorithms: RSA, Diffie-Hellman, Hash Functions: MD5, SHA family, HMAC, Digital Signatures and Public Key Infrastructure (PKI), Key exchange protocols, Cryptographic Services: Integrity, confidentiality, and authentication.	10	30
Section II			
4.	**Block and Stream Ciphers:** Differences between block ciphers and stream ciphers, Modes of Operation: Electronic Code Book, Cipher Block Chaining Mode, Cipher Feedback mode, Output Feedback mode, Counter mode, Triple DES.	10	25
5.	**Cryptanalysis:** Basic Cryptanalysis Techniques, Brute Force Attack, Frequency Analysis.	08	15
6.	**Cryptography and Network Security:** Overview of Web Security: SSL/TLS, HTTPS, Email Security: PGP and S/MIME, Virtual Private Networks (VPNs) and IPsec.	04	10
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Implement a Caesar Cipher for basic encryption and decryption.	02

2.	Write a program to encrypt and decrypt a simple Monoalphabetic Cipher.	02
3.	Implement Vigenère Cipher with key-based encryption/decryption.	02
4.	Visualize the effects of encryption using the Caesar Cipher by testing it on plain text inputs.	02
5.	Implement and test Playfair encryption and decryption using a 5x5 matrix.	02
6.	Implement encryption and decryption using the rail fence technique.	02
7.	Write a program to encrypt and decrypt using columnar transposition.	02
8.	Write a program to encrypt using Hill cipher.	02
9.	Write a program to implement DES encryption and decryption on a given plaintext.	04
10.	Implement AES encryption in ECB mode and CBC mode and perform encryption on sample text.	04
11.	Implement the RSA algorithm for public-key encryption and decryption.	04
12.	Demonstration of Virus, threads and firewall.	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Cryptography and Network Security: Principles and Practice, 7th	William Stallings	Pearson Education

Reference Book(s):

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

Web Material Link(s):

- http://ggu.ac.in/download/Class-Note14/public%20key13.02.14.pdf
- https://onlinecourses.nptel.ac.in/noc19_cs28/preview

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests, each of 30 marks and 1 hour of duration 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 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 15 marks during End Semester Exam.
- Viva-voce consists of 15 marks during End Semester Exam.

Course Outcome(s):

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

SECE3260	CRYPTOGRAPHY FUNDAMENTALS
CO 1	Understand and Apply Basic Cryptographic Techniques
CO 2	Analyze and Implement Modern Cryptographic Algorithms
CO 3	Evaluate Cryptographic Protocols and Security Services
CO 4	Understand and Apply Cryptanalysis Techniques

Mapping of CO with PO

SECE3260	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	1								1			
CO 2		1			1						1	
CO 3			1			1				1		
CO 4				1				1				

Mapping of CO with PSO

SECE3260	PSO1	PSO2	PSO3
CO 1	1	1	2
CO 2		1	1
CO 3	1	3	
CO 4	1		1

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Introduction to Cryptography	1,2
2.	Classical Cryptography Techniques	1,2,3
3.	Modern Cryptographic Algorithms	3,4
4.	Block and Stream Ciphers	2,3,4
5.	Cryptanalysis	2,3, 5
6.	Cryptography and Network Security	2,3, 6

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3271
Course Name: Network Security
Prerequisite Course(s): Computer Networks (SECE2240)

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 principles, approaches, and standards of network security.
- Explore transport-level security mechanisms and email security techniques.
- Implement network defence mechanisms and advanced security protocols.
- Analyze and apply network security tools for monitoring, prevention, and defence.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Network Security and Standards** Introduction: Need for security, Security approaches, Principles of security. Types of Security Attacks and Services: OSI Security Architecture, Model for Network Security, VLAN hopping, Tag stack attack, Broadcast floods, ARP spoofing, DHCP DoS, DHCP and DNS hijacking. Network Security Standards: Security Services, Security Attacks, Security Policies. LAN Security Mechanisms: Control Plane Policing, Link Layer Security, Port/BPDU guard, 802.1AE/encryption, NetFlow, RMON.	06	12
2.	**Transport-Level Security and Email Security** Transport-Level Security: Web Security Considerations, Secure Sockets Layer (SSL), Transport Layer Security (TLS), HTTPS standard, Secure Shell (SSH). Email Security: Pretty Good Privacy (PGP), S/MIME, DomainKeys Identified Mail.	06	13
3.	**IP Security and VPNs** IP Security: Overview, IP Security Policy, Encapsulating Security Payload, Combining Security Associations, Internet Key Exchange (IKE), VPNs.	04	10
4.	**Network Defence Mechanisms and Advanced Topics** Intrusion Detection Systems (IDS): Tools, Password Management, Firewalls (Characteristics, Types, Configurations, ACLs). Network Security Standards and Tools: Traffic Monitoring, Datacentres Security. Advanced Topics: Cloud Infrastructure Security: Topologies, Routing and Addressing, FlowIPS, Cloud Security Solutions.	07	15
Section II			
Module No.	Content	Hours	Weightage in %

5.	**Mobile, Wireless, and Secure Mobile Services** Mobile Network Security: Security for 3G, 4G, 5G networks, Kasumi, Platform security, App security, Hardware security. Wireless Network Security: IEEE 802.11i, Wireless Intrusion Detection and Prevention, Wireless Network Positioning, Cellular Jamming Attacks and Mitigation. Secure Mobile Services: Mobile VoIP Security, Mobile App Security.	06	15
6.	**Network Security Tools and Techniques** Firewall Management: Types of Firewalls, Configuration, and Placement. Access Control Lists (ACLs): Overview, Application in securing Networks. Network Monitoring and Intrusion Prevention: Tools and Techniques for Active Network Defence.	06	15
7.	**Security Protocols and Applications** Secure Communication Protocols: SSL/TLS for Web Security, SSH for Remote Login, IPSec for VPNs. Web Security Threats: Web Application Security, HTTPS, Secure Email (PGP, S/MIME). VPN and Secure Remote Access: Principles, Configurations, Security Challenges.	06	15
8.	**Contemporary Issues in Network Security** Emerging Topics: Zero Trust Architecture, Post-Quantum Cryptography, Security Challenges in IoT. Trends: Ethical Hacking and Penetration Testing.	04	05
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Configure basic firewall rules to control traffic flow and enhance network security	03
2.	Capture and analyze network packets to understand data flow, protocols, and identify potential security issues	03
3.	Implement SSL/TLS certificates on a website to ensure secure communication between the server and the client	03
4.	Set up a Virtual Private Network (VPN) to encrypt communication between a remote client and a server	03
5.	Simulate a DNS spoofing attack to learn how attackers manipulate DNS responses to redirect users to malicious websites	02
6.	Set up and configure an IDS to monitor and analyze network traffic for malicious activities	03
7.	Configure SSH key-based authentication for secure remote access to a server, eliminating the need for password-based authentication	02
8.	Set up lab for IP Spoofing Attack Simulation	02
9.	Perform practical of Nmap to find open ports, OS detection, Service Version detection	03
10.	Simulate VLAN Hopping and ARP Spoofing attacks, then configure defenses to mitigate these attacks	03
11.	Set up a wireless network with WPA3 security and simulate a deauthentication attack	03
	TOTAL	**30**

Text Book(s):

Title	Author/s	Publication
Network Security Essentials	William Stallings	Pearson Publishers
Cryptography and Network Security- Principles and Practice	William Stallings	Pearson Publishers

Reference Book(s):

Title	Author(s)	Publication
Foundations of Information Security: A Straightforward Introduction	Jason Andress	No Starch Press
Security in Computing	Charles P. Pfleeger, Shari Lawrence Pfleeger and Jonathan Margulies	Pearson Publishers

Web Material Link(s):

- https://onlinecourses.nptel.ac.in/noc25_ee54/preview?utm_source=chatgpt.com
- https://www.coursera.org/courses?query=network%20security&utm_source=chatgpt.com
- https://www.youtube.com/watch?v=inWWhr5tnEA&list=PLEiEAq2VkUUJfPOj5nRounXvf3n17PCft

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

SECE3271	NETWORK SECURITY
CO 1	Analyze security threats, attacks, and vulnerabilities in network environments.
CO 2	Implement and configure secure protocols (SSL/TLS, IPsec, SSH) and VPNs for safe communication.
CO 3	Design and deploy network defense systems such as firewalls, intrusion detection/prevention systems, and ACLs.
CO 4	Understand mobile and wireless security concerns and apply appropriate security solutions.
CO5	Investigate contemporary security challenges including zero-trust architecture, IoT security, and penetration testing techniques.

Mapping of CO with PO

SECE3271	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	PO11	PO12
CO 1	3	3	1	1					1			
CO 2	3	2	1		3				1			
CO 3	3	2	3	1	3							
CO 4	3	2	2	1		2						1
CO 5	3	3	2	1	3	2				1		3

Mapping of CO with PSO

SECE3271	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	3	2
CO 3	3	3	2
CO 4	2	2	2
CO 5	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Introduction to Network Security and Standards	1, 2
2.	Transport-Level Security and Email Security	2, 3, 4
3.	IP Security and VPNs	2, 3, 4
4.	Network Defence Mechanisms and Advanced Topics	2, 3, 4, 5
5.	Mobile, Wireless, and Secure Mobile Services	2, 3, 4, 5
6.	Network Security Tools and Techniques	3, 4, 5
7.	Security Protocols and Applications	3, 4, 5
8.	Contemporary Issues in Network Security	3, 4, 5, 6

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT3270
Course Name: Web Technologies
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	5	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:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Web Design:** Concept of WWW, Internet and WWW, HTTP Protocol : Request and Response, Web browser and Web servers, Concepts of effective web design, Web design issues including Browser, Display resolution, Page Layout and linking, User centric design, Sitemap, Planning and publishing website, Designing effective navigation	07	20
2.	**HTML:** Basics of HTML, formatting and fonts, commenting code, color, hyperlink, lists, tables, images, forms, XHTML, Meta tags, Character entities, frames and frame sets, Browser architecture and Web site structure. Overview and features of HTML5	08	20
3.	**Style sheets:** Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, CSS2, Overview and features of CSS3	07	10
Section II			
Module No.	Content	Hours	Weightage in %
4.	**JavaScript:** Client side scripting with JavaScript, variables, functions, conditions, loops and repetition, Pop up boxes, Advance JavaScript: Javascript and objects, JavaScript own objects, the DOM and web browser environments, Manipulation using DOM, forms and validations, DHTML : Combining HTML, CSS and Javascript, Events and buttons.	08	20
5.	**PHP:** Introduction and basic syntax of PHP, decision and looping with examples, PHP and HTML, Arrays, Functions, Browser control and detection, string, Form processing, Files, Advance Features: Cookies	08	20

	and Sessions, Object Oriented Programming with PHP		
6.	**MySQL:** Basic commands with PHP examples, Connection to server, PHP my admin and database bugs	07	10
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Design web a page for the department timetable containing a suitable header, footer, description of the course codes and titles, faculty name and initialises, etc., use href, list tags and add University logo as a background. Using table tag and additional features like spanning rows, columns and table borders. [Refer your class timetable]	02
2.	a) Create a form to collect Student feedback. (Use textbox, text area, checkbox, radio button, select box etc.). b) Create a web page using frame. Divide the page into two parts with Navigation links on left hand side of page (width=20%) and content page on right hand side of page (width = 80%). On clicking the navigation Links corresponding content must be shown on the right-hand side.	03
3.	Create a web page using frame. Divide the page into two parts with Navigation links on left hand side of page (width=20%) and content page on right hand side of page (width = 80%). On clicking the navigation Links corresponding content must be shown on the right-hand side.	02
4.	Write HTML code to develop a webpage having two frames that divide the webpage into two equal rows and then divide the row into equal columns fill each frame with a different background colour.	03
5.	Create your resume using HTML tags also experiment with colors, text (bold, italic and different headings), image, link, size and also other related tags.	02
6.	Design a web page using CSS with suitable design for the following: i.Demonstrate different font styles ii.Control the repetition of image with background-repeat property iii.Define style for links as a: link, a: active, a: hover, a: visited iv. Demonstrate Element visibility property	03
7.	Design a web page of your institute with an attractive background color, text color, an Image, font etc. (use internal CSS). Use External CSS to format the class timetable.	02
8.	Develop simple calculator for Addition, Subtraction, Multiplication and Division operation using JavaScript. a) Create HTML Page that contains form with fields Name, Email, Mobile No, Gender, Favorite Color and a button. Write a JavaScript code to validate all the fields when the button is clicked, later combine and display the information in textbox.	03
9.	Write an XHTML document which displays a form containing text elements to input register number, sub-code, marks in three tests and a button element. Also write Java script compute the average of two best tests on click of button and print average marks using alert. Validate all the fields using JavaScript.	03
10.	a) Write a PHP script to display today's date in dd-mm-yyyy format. b) Write a PHP script to check whether the number is prime or not when user input a valid number from client side.	03
11.	Create HTML page that contain textbox, submit / reset button. Write PHP script to display this information and also store into a text file.	02
12.	Write a PHP script for login authentication. Design an HTML form which takes Username and Password from user and validate against stored Username and Password in a file.	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Web Design with HTML, CSS, JavaScript and jQuery	by Jon Duckett	Wiley-India

Reference Book(s):

Title	Author(s)	Publication
Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, XML and AJAX, Black Book	Kogent Learning Solutions Inc.	Dreamtech Press
Developing Web Applications	Ralph Moseley and M. T. Savaliya	Wiley-India

Web Material Link(s):

- Web Technology PDF Download | WT Books, Lecture Notes, Studymaterial

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

SEIT3270	WEB TECHNOLOGIES
CO 1	Understand the fundamental concepts of web technologies
CO 2	Understand and implement client-side and server-side programming
CO 3	Learn HTML, CSS, and JavaScript for web page development
CO 4	Work with databases for dynamic web applications

Mapping of CO with PO

SEIT3270	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	PO11	PO12
CO 1	1											
CO 2	1		1									
CO 3					1							
CO 4				1								
CO 5							1					

Mapping of CO with PSO

SEIT3270	PSO1	PSO2	PSO3
CO 1	1		

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

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Introduction to Web Design	1,2
2.	HTML	1,2,3
3.	Style sheets	3,4
4.	JavaScript	2,3,4
5.	PHP	2,3
6.	MySQL	2,3

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3630
Course Name: Wireless Network & Mobile Computing
Prerequisite Course(s): Computer Networks

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
02	02	00	03	40	60	40	60	0	0	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Explain the terminology, principles, architectures, protocols, and methodologies used in Wireless Communication and Mobile Computing Networks.
- Understand the basics of wireless communication technologies, including 3G, 4G, 5G, IoT, and WiMAX.
- Build knowledge of Mobile Computing Algorithms, network layers, and transport protocols for wireless communication.
- Develop skills in designing and implementing wireless applications using modern tools, mobile OS, and Wireless Application Protocols.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Mobile Computing Architecture** Types of Networks, **Architecture for Mobile Computing**: 3-tier Architecture and Design Considerations, Applications. **Wireless Transmission:** Signals, Antennas, Signal propagation, Multiplexing, Modulation, Cellular Systems. **Medium Access Control:** Motivation for a specialized MAC, SDMA, FDMA, TDMA, CDMA.	04	05
2.	**Wireless Networks – 1** **GSM and SMS:** Global Systems for Mobile Communication (GSM and Short Service Messages SMS), GSM Architecture, Protocols, Call routing in GSM, Handover, Security. Introduction to SMS, SMS Architecture, SM MT, SM MO, SMS as Information bearer, applications.	04	15
3.	**Wireless Networks – 2** **Advanced Data Network Technologies** **GPRS:** GPRS and Packet Data Network, GPRS Network Architecture, GPRS Network Operations, Data Services in GPRS, Applications for GPRS, Introduction to WiMAX.	04	15
4.	**Wireless Networks –3** 3G,4G, and 5G Networks: Third Generation Networks, Fourth Generation Networks, Vision of 5G. 3G vs. 4G vs. 5G: Features and Challenges and Applications. Introduction to Emerging Wireless Technologies: Wi-Fi 6, Li-Fi, NB-IoT.	04	15
Section II			
Module No.	Content	Hours	Weightage in %

5.	**Mobile network layer** Mobile IP, Dynamic Host Configuration protocol, Mobile ad-hoc networks (MANETs). **Mobile Transport layer:** Traditional TCP, classical TCP improvements, TCP over 3G/4G wireless networks	04	10
6.	**Mobile OS and Computing Environment** **Smart Client Architecture:** **The Client:** User Interface, Data Storage, Performance, Data Synchronization, Messaging. **The Server:** Data Synchronization, Enterprise Data Source, Messaging. **Mobile Operating Systems**: Android, iOS, Introduction to Wearable Device OS. Development Process: Key Considerations for Mobile Applications.	03	15
7.	**Building Mobile Internet Applications** Thin client Architecture: the client, Middleware, Messaging Servers, Processing a Wireless request. Wireless Applications Protocol (WAP) Overview. Wireless Languages: Markup Languages (HDML, WML, HTML, cHTML, XHTML, VoiceXML).	04	15
8.	**Emerging and Future Technologies**: The architecture of future Networks, Wireless Sensor Network (WSN), IoT, **Edge Computing, Fog Computing**, and their role in mobile networks.	03	10
	TOTAL	30	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Setup & Configuration of Wireless Access Point (AP)	04
2.	Implementation of Wireless Network with a number of nodes and different parameters using Simulator.	04
3.	Study of WLAN: Ad Hoc & Infrastructure Mode	04
4.	GSM modem study and **Modern Messaging Systems:** Implement a basic client-server messaging application using **MQTT** or push notifications.	04
5.	**Development of a Progressive Web App (PWA):** Build a simple PWA to demonstrate mobile-friendly design and offline capabilities.	04
6.	Design and Program Income Tax and Loan EMI Calculator for Mobile Phones	04
7.	Implementation of Mobile Network using Network Simulator (NS3/GNS3)	06
	TOTAL	30

Text Book(s):

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

Reference Book(s):

Title	Author(s)	Publication
Principles of Mobile Computing	UIWE Hansman, Other Merk, Martin-S-Nickious, Thomas Stohe	Springer international Edition
Mobile Computing	Ashok K. Teludkar	TMH
Mobile AdHoc Networks	Chai K.Toh	Prentice Hall
Programming with C	Byron Gottfried	Tata McGraw Hill

Web Material Link(s):

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

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be

converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Practical:
- Continuous Evaluation consists of the performance of practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 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

SECE3630	WIRELESS NETWORK & MOBILE COMPUTING
CO 1	Understand and relate the fundamentals of wireless communication and mobile computing architectures to real-world applications, including cellular and IoT systems.
CO 2	Analyze the unique characteristics of wireless networks, including security, mobility, energy efficiency, and scalability, with practical insights into current technologies like 3G, 4G, and 5G.
CO 3	Design and evaluate wireless network protocols, including MAC, TCP/IP extensions, and mobile communication systems, using simulation tools
CO 4	Develop the knowledge of TCP/IP extensions for mobile and wireless networking.

Mapping of CO with PO

SECE3630	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C0 1	1	1	1	1								1
C0 2	1	2	1	1	1		1					1
C0 3	1	2	1	2	2		2				1	1
C0 4	1	2	1	2	1		2					1

Mapping of CO with PSO

SECE3630	PSO1	PSO2	PSO3
CO 1		3	3
CO 2	3	2	2
CO 3	3	3	3
CO 4	3	3	2

Level of Revised Bloom's Taxonomy in Assessment:

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

Module No	Content	RBT Level
1	Mobile Computing Architecture	1,2
2	Wireless Networks – 1	1,2
3	Wireless Networks – 2	2,3,4
4	Wireless Networks –3	2,3,4
5	Mobile network layer, Mobile Transport layer	2,4
6	Mobile OS and Computing Environment	3,6
7	Building Mobile Internet Applications	3,6
8	The architecture of future Networks, Wireless Sensor Network, IoT	3, 5, 6

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SEIT3660
Course Name: Web Security
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
2	2	0	3	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 web security and potential threats.
- explore modern tools and techniques for securing web applications.
- learn about secure coding practices and protocols.
- apply knowledge in practical scenarios through projects and labs.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Overview of Web Applications:** Introduction history of web applications, interface ad structure, benefits and drawbacks of web applications, Web application Vs Cloud application, Security Fundamentals: Input Validation - Attack Surface Reduction Rules of Thumb- Classifying and Prioritizing Threads, OWASP Top Ten	4	10
2.	**Security Fundamentals:** Input Validation, Attack Surface Reduction, Classifying and Prioritizing Threats, Authentication, Authorization, Session Management Fundamentals, Attack Surface: Analysis, Defining, Identifying, Measuring, Assessing, and Managing, Introduction to MITRE Framework, Matrix, Techniques, Benefits	6	20
3.	**Information Gathering:** WhoIs, nsLookup, netcraft, Web server fingerprinting, Subdomain enumeration, Fingerprinting frameworks, Hidden resource enumeration, Security misconfigurations, Google hacking database, Shodan HQ	6	20
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Web Application Vulnerabilities:** Understanding vulnerabilities in traditional client server application and web applications, client state manipulation, cookie-based attacks, SQL injection, cross domain attack (XSS/XSRF/XSSI) http header injection. SSL vulnerabilities and testing - Proper encryption use in web application - Session vulnerabilities and testing - Cross-site request forgery	6	20
5.	**Web Application Mitigations:**	6	20

	Http request, http response, rendering and events, html image tags, image tag security, issue, java script on error, JavaScript timing, port scanning, remote scripting, running remote code, frame and iframe, browser sandbox, policy goals, same origin policy, library import, domain relaxation		
6.	**Web Application Tools:** Scanning for web vulnerabilities tools: Nikto, W3af, HTTP utilities - Curl, OpenSSL and Stunnel, Application Inspection tools – Zed Attack proxy, Sqlmap. DVWA, Webgoat, Password Cracking and Brute-Force Tools – John the Ripper, L0htcrack, Pwdump, HTC-Hydra, Burp Suite, XSSHunter, sqlmap, Shodan, BuiltWith, Nikto	2	10
	TOTAL	30	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Deploy and verify HTTPS on a local web server.	3
2.	Perform Search engine footprinting using search engine dorks.	4
3.	Implement CSRF Protection: Secure a web app with CSRF tokens.	4
4.	XSS Mitigation: Implement input sanitization and CSP to secure an application.	3
5.	Simulate and mitigate SQL injection on a vulnerable application.	3
6.	Perform banner grabbing using nmap & netcat.	4
7.	Perform security assessments with OWASP ZAP and Burp Suite.	4
8.	Setup a Web Application Firewall and test its effectiveness.	2
9.	Use Postman to test API authentication and authorization.	3
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Web Application Security A Beginner's Guide	Sullivan, Bryan, and Vincent Liu	McGraw Hill Professional

Reference Book(s):

Title	Author(s)	Publication
The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy	Patrick Engebretson	Elsevier, 2nd Edition
Seven Deadliest Web Application Attacks"	Mike Shema	O'Reilly
Web Application Security: Exploitation and Countermeasures for Modern Web Applications	Andrew Hoffman	O'Reilly
The Web Application Hacker handbook 2	Dafydd Stuttard and Marcus Pinto	WILEY

Web Material Link(s):

https://owasp.org/
https://www.fortinet.com/resources/cyberglossary/what-is-web-security
https://www.freecodecamp.org/news/tag/web-security/

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

SEIT3660	WEB SECURITY
CO 1	Identify the vulnerabilities in the web applications
CO 2	Apply the security principles in developing a reliable web application.
CO 3	Use industry standard tools for web application security.
CO 4	Apply penetration testing to improve the security of web applications.

Mapping of CO with PO

SEIT3660	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	3	3	2	2	3	2	2	1	2	2	1	2
CO 2	3	3	3	2	3	2	2	2	2	2	1	2
CO 3	3	3	2	3	3	2	1	1	1	2	1	2
CO 4	3	3	3	3	3	2	2	2	2	2	1	2

Mapping of CO with PSO

SEIT3660	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	2	3
CO 3	3	2	2
CO 4	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Overview of Web Applications:	1,2
2.	Security Fundamentals:	1,2
3.	Information Gathering:	1,2,3
4.	Web Application Vulnerabilities:	2,3,4,5
5.	Web Application Mitigations:	3,4,5
6.	Web Application Tools:	3,4,5,6

P P Savani University
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Course Code: SEIT3670
Course Name: Application Security
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
2	2	0	3	40	60	40	60	0	0	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Understand application types and architecture
- Master secure software development life cycle
- Understand secure supply chain management
- Understand cloud and container security principles
- Understand evaluation and mitigate security risks

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Application Types:** Introduction, Client/Server Applications, Components of Client/Server Applications (Logical & Physical Architecture), Web Applications: About Web Applications, Technologies used to create Web Applications, Components of Web Application Architecture, Data Warehouse Applications: About DW Applications, Uses, Physical & Logical Architecture, Management Information Systems	06	20
2.	**Understanding secure SDLC** Introduction, Application Security Terms & Definition, Application Security Goal, NIST.	04	10
3.	**Defense in Depth:** API Security, Content Security Policy, Server-Side Request Forgery, Vulnerability Management, Common Vulnerability Scoring System, Security Misconfiguration.	05	20
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Supply Chain Security:** Introduction, Supply Chain Defenses, .Software Composition Analysis, Software Bill of Material, Dependency Track.	04	10
5.	**Cloud and Container Security:** Introduction to Cloud Security Concepts, AWS Security Pillar, AWS Identity and Access Management, AWS Data Protection, AWS Application Security, Container Security.	06	20
6.	**Basic Threat Modeling:** Introduction to Risk Rating, Security Controls, Introduction to Threat Modeling, Types of Threat Modelling, Manual Threat Modeling,	05	20

	Microsoft Threat Model Tool.		
	TOTAL	30	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to Secure Coding Environment.	04
2.	Implementing Secure Input Validation Techniques.	04
3.	Threat Modeling Using STRIDE Model.	06
4.	Implementing Encryption Techniques in Applications.	06
5.	Implementing security for cloud data.	06
6.	Compliance & Security Policies Case Study.	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Fundamentals of Secure Software	Derek Fisher	Packt

Reference Book(s):

Title	Author(s)	Publication
Securing Systems: Applied Security Architecture and Threat Models	Brook S. E. Schoenfield	CRC Press
Threat Modeling: Designing for Security	Adam Shostack	Wiley
Security for Containers and Kubernetes	Luigi Aversa	BPB Publications
A Practical Guide to Software Supply Chain Security	E-Book	Red Hat

Web Material Link(s):

- https://github.com/paragonie/awesome-appsec
- https://www.cisa.gov/resources-tools/resources/free-cybersecurity-services-and-tools

Course Evaluation:

Theory:

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

Practical:

- Continuous Evaluation Consist of Performance of Practical which will be evaluated out of 20 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 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

SEIT3670	APPLICATION SECURITY
CO 1	Demonstrate Understanding of Application Architectures and Security Principles
CO 2	Implement Secure Software Development Practices
CO 3	Apply Defense-in-Depth Strategies
CO 4	Secure Cloud and Container Environments

CO 5	Perform Threat Modeling and Risk Assessment

Mapping of CO with PO

SEIT3670	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	3	2	1	1	1	2	1	2	1	2	1	2
CO 2	3	3	3	1	2	2	1	2	3	3	1	3
CO 3	3	3	3	1	3	2	1	2	2	2	1	3
CO 4	3	3	3	3	3	2	3	1	3	3	1	3
CO 5	3	3	3	3	3	2	1	2	3	3	3	3

Mapping of CO with PSO

SEIT3670	PSO1	PSO2	PSO3
CO 1	2	1	2
CO 2	3	1	3
CO 3	3	1	2
CO 4	3	1	3
CO 5	2	1	3

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Application Types	1, 2
2.	Understanding secure SDLC	1, 2, 3
3.	Defense in Depth	2, 3, 4
4.	Supply Chain Security	2, 3
5.	Cloud and Container Security	1, 2, 3, 4
6.	Basic Threat Modeling	1, 2, 3, 4, 5

P P Savani University
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Department of Computer Engineering

Course Code: SECE3920
Course Name: Summer Training
Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- have first-hand experience the real time situations in industrial scenario.
- get familiar with engineering applications in industrial spectrum
- learn to adapt themselves in professional scenario

Outline of the Summer Training:

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

Course Evaluation:

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

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

SECE3920	SUMMER TRAINING
CO 1	Study, analysis and describe about the surrounding industrial environment.
CO 2	Describe use of advanced tools and techniques industry.
CO 3	Interact with industrial personnel and follow engineering practices and discipline prescribed in industry.
CO 4	Develop awareness about general workplace behavior and build interpersonal and team skills.
CO 5	Prepare professional work reports and presentations.

Mapping of CO with PO

SECE3920	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	PO11	PO12
CO 1	2	2	1	2		2	2		1			1
CO 2	3	2	2	3	3				1		1	2
CO 3	2	2	1			3	2	3	2		1	2
CO 4		1				3	2	3	3			2
CO 5	2	2	2			3		2	2	3	2	2

Mapping of CO with PSO

SECE3920	PSO1	PSO2	PSO3
CO 1	2	2	1
CO 2	3	2	2
CO 3	2	1	2
CO 4	1	1	2
CO 5	1	1	2

Report Writing Guidelines

A. Report Format:

1.Title Page (to be provided by the respective supervisor)

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

2.Project Certification Form

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

3.Acknowledgements

[All persons (e.g. supervisor, technician, friends, and relatives) and organization/authorities who/which have helped in the preparation of the report shall be acknowledged.]

4.Table of Contents/Index with page numbering

5.List of Tables, Figures, Schemes

6.Summary/abstract of the report.

7.Introduction/Objectives of the identified problem

8.Data Analysis and Finding of Solution

9.Application of the identified solution

10.Future Scope of enhancement of the Project and Conclusion

11."Learning during Project Work", i.e. "Experience of Journey during Project Duration"

12.References(must)

13.Bibliography

14.Annexures (if any)

B. Guideline for Report Formatting:

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

P P Savani University
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Department of Computer Engineering

Course Code: SECE3221
Course Name: Internet of Things
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	
2	4	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 fundamental concepts and technologies underlying the Internet of Things (IoT).
- develop the practical skills to design, develop, and implement simple IoT systems using hardware and software tools.
- gain knowledge of IoT communication protocols, networking concepts, and cloud computing platforms relevant to IoT.
- analyze and evaluate the security, ethical, and societal implications of IoT technologies.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to IoT:** Overview of IoT: Definition, scope, and applications, End-to-End IoT Architecture, Challenges and opportunities in IoT adoption. IoT Trends: Edge computing, AI integration, digital twins, fog computing, 5G for IoT, IoMT, IIoT, smart cities	03	10
2.	**Embedded IoT Devices:** Overview of embedded systems and selection criteria for IoT hardware. Comparison: Microcontroller (MCU) vs. Microprocessor (MPU) devices. Introduction to development boards: Arduino UNO, ESP8266, and ESP32. GPIO basics and interfacing with sensors and actuators.	05	17
3.	**Sensors and Actuators:** Overview of sensors: Types and working principles. Actuators: Types, functionality and applications. Programming and interfacing of analog, digital, and protocol-based sensors. Case study	04	13
4.	**IoT Networking and Gateway Devices:** Networking Fundamentals: addresses, subnets, routing, Common network protocols: TCP/IP, UDP, HTTP, Introduction to IoT Gateways: Definition, functions, Types, Introduction to Raspberry Pi and its capabilities in IoT, Setting up the Raspberry Pi development environment	04	13
Section II			
Module No.	Content	Hours	Weightage in %
5.	**IoT Communication Protocols:** IoT Network Layer Protocols: RPL, 6LoWPAN, LoRaWAN, Wireless	06	20

	Connectivity Options: Wi-Fi, Bluetooth/BLE, Zigbee, Cellular, NFC, Communication Protocols: MQTT, HTTP, CoAP		
6.	**IoT Cloud and IoT Applications:** Cloud computing models, Cloud services for IoT, IoT Cloud Platforms, IoT data management, Importance of data analytics in IoT, IoT Applications: RFID, iBeacon, Industry 4.0	05	17
7.	**IoT Security:** Security Concerns in IoT: Data privacy, device vulnerabilities, best practice to Secure IoT: Authentication, authorization, encryption, access control, secure boot, firmware updates, Case study	03	10
	TOTAL	30	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Understand the fundamentals of IoT hardware and software, including electronics basics, Arduino IDE setup, and Tinkercad circuit simulation and IoT career pathways.	04
2.	Explore GPIO interfacing with Arduino to control digital and analog devices using sensors, LEDs, buttons, and PWM techniques for motor and brightness control.	04
3.	Interface temperature, obstacle/motion, distance measure sensors with Arduino to acquire real-world data and develop mini-projects like temperature monitoring and motion-activated systems.	06
4.	Set up and program NodeMCU/ESP8266 for IoT applications with Wi-Fi connectivity and build basic HTTP offline/online web servers for data communication.	04
5.	Develop IoT applications with NodeMCU, integrating sensors like DHT22 to log data using offline http server and MPU6050 to control devices such as LEDs through gesture recognition.	06
6.	Implement MQTT protocol for IoT communication by setting up a broker and exchanging data between devices for tasks like sensor logging and actuator control.	06
7.	Set up Raspberry Pi environment, utilize it for GPIO control, sensor and actuator interfacing, and developing basic home automation systems.	04
8.	Visualize IoT data and control actuators using Node-RED by creating data acquisition flows, charts, and integrating with NodeMCU for interactive control.	06
9.	Integrate IoT devices with cloud platforms to publish, visualize, and control data using dashboards and commands on platforms like ThingSpeak and Adafruit IO.	04
10.	Design an Android app using MIT App Inventor or Android Studio to control IoT devices via MQTT or HTTP, enabling real-time monitoring and operation.	06
11.	Capstone Project	10
	TOTAL	60

Text Book(s):

Title	Author/s	Publication
Introduction to IoT	Sudip Misra, Anandarup Mukherjee, Arijit Roy	Cambridge University Press
Internet of Things	Shriram K. Vasudevan, Abhishek S. Nagarajan, R. M. D. Sundaram	Wiley India
The Internet of Things Enabling Technologies, Platforms, and Use Cases	Pethuru Raj, Anupama C. Raman	CRC Press, Taylor & Francis

Reference Book(s):

Title	Author(s)	Publication
Internet of Things	Raj Kamal	Tata McGraw Hill

Fundamentals of IoT	Rajan Gupta, Supriya Madan	BPB Publications

Web Material Link(s):

- https://nptel.ac.in/courses/106105166
- https://randomnerdtutorials.com/

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

SECE3221	**INTERNET OF THINGS**
CO 1	Explain the core concepts, architecture, and applications of the Internet of Things.
CO 2	Select and interface appropriate sensors, actuators, and microcontrollers for IoT projects.
CO 3	Develop and implement simple IoT applications using Arduino, NodeMCU, and Raspberry Pi.
CO 4	Understand and apply IoT communication protocols and network concepts.
CO 5	Evaluate the security, ethical, and societal implications of IoT technologies.

Mapping of CO with PO

SECE3221	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	1							2		3
CO 2	3	3	3	1	3					1		2
CO 3	3	1	3	2	3				3			3
CO 4	3			1	3							3
CO 5	1		1			3	3	3	1			3

Mapping of CO with PSO

SECE3221	PSO1	PSO2	PSO3
CO 1	2	1	1
CO 2	3	2	1
CO 3	3	3	2
CO 4	2	2	1
CO 5	1	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 IoT	1,2,3
2.	Embedded IoT Devices	2,3,4
3.	Sensors and Actuators	2,3,4,6
4.	IoT Networking and Gateway Devices	2,3,4
5.	IoT Communication Protocols	2,3,4
6.	IoT Cloud and IoT Applications	2,3,4,5
7.	IoT Security	2,4,5,6

P P Savani University
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Course Code: SECE3231
Course Name: Cloud Computing & Applications
Prerequisite Course(s): Computer Networks, and Operating System

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

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Cloud Computing** Overview, Roots of Cloud Computing, Layers and Types of Cloud, Desired Features of a Cloud, Benefits and Disadvantages of Cloud Computing, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks	05	10
2.	**Cloud Architecture, Services and Applications** Exploring the Cloud Computing Stack, connecting to the Cloud, Infrastructure as a Service, Platform as a Service, Saas Vs. Paas, Using PaaS Application Frameworks, Software as a Service, Cloud Deployment Models, Public vs Private Cloud, Cloud Solutions, Cloud ecosystem, Service management, Identity as a Service, Compliance as a Service	05	10
3.	**Virtualization, Abstraction and Cloud Platform** Introduction to Virtualization Technologies, Load Balancing and Virtualization, Understanding Hypervisors, Understanding Machine Imaging, Porting Applications, Virtual Machines Provisioning and Manageability Virtual Machine Migration Services, Virtual Machine Provisioning and Migration in Action, Provisioning in the Cloud Hypervisors	07	15
4.	**Cloud Infrastructure and Cloud Resource Management** Architectural Design of Compute and Storage Clouds, Layered Cloud Architecture Development, Design Challenges, Inter Cloud Resource Management, Resource Provisioning and Platform Deployment, Global Exchange of Cloud Resources. Administrating the Clouds, Cloud Management Products, Emerging Cloud Management Standards	06	15

Section II			
Module	Content	Hours	Weightage in %
5.	**Cloud Security** Security Overview, Cloud Security Challenges and Risks, Software-as-a- Service Security, Cloud computing security architecture: Architectural Considerations, General Issues Securing the Cloud, Securing Data, Data Security, Application Security, Virtual Machine Security, Identity and Presence, Identity Management and Access Control, Autonomic Security Establishing Trusted Cloud computing, Secure Execution Environments and Communications, , Identity Management and Access control Identity management, Access control, Autonomic Security Storage Area Networks, Disaster Recovery in Clouds	06	15
6.	**AWS Programming, Management Console and Storage** Basic Understanding APIs - AWS programming interfaces, Web services, AWS URL naming, Matching interfaces and services, Elastic block store - Simple storage service, Define the AWS Cloud and its value proposition, Identify aspects of AWS Cloud economic, List the different cloud architecture design principles, Security and Compliance, Define the AWS shared responsibility model, Define AWS Cloud security and compliance concepts, Identify AWS access management capabilities, Identify resources for security support	09	20
7.	**AWS Technology, Billing and Pricing** Define methods of deploying and operating in the AWS Cloud, Define the AWS global infrastructure, Identify the core AWS services, identify resources for technology support, Compare and contrast the various pricing models for AWS, Recognize the various account structures in relation to AWS billing and pricing, Identify resources available for billing support	07	15
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1	Cloud Concepts Overview	02
2	Cloud Economics and Billing	02
3	Cloud Global Infrastructure Overview	02
4	Explore Cloud Security Fundamentals	04
5	Networking and Content Delivery	04
6	Explore Compute Services (IAAS)	04
7	Explore Storage Services	04
8	Explore Database Services	04
9	Cloud Architecting	02
10	Auto Scaling and Monitoring	02
	TOTAL	30

Text Book(s):

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

Reference Book(s):

Title	Author/s	Publication
Amazon Web Services for Dummies	Bernard Golden	Dummies
Amazon Web Services in Action	Michael Wittig and Andreas Wittig	Dreamtech Press
Building Applications in the Cloud:	Christopher M. Moyer	Pearson Addison-

Concepts, Patterns and Projects		Wesley Professional
Cloud Computing Design Patterns	Thomas Erl	Prentice Hall

Web Material Link(s):

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

Course Evaluation:

Theory:

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

Practical:

- Continuous Evaluation Consist of Performance of Practical which will be evaluated out of 20 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 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

SECE3231	CLOUD COMPUTING & APPLICATIONS
CO 1	Describe various cloud computing features, challenges through various models and services.
CO 2	Apply different approaches of cloud computing system for efficient data storage with minimal cost.
CO 3	Identify various management related services of aws.
CO 4	Distinguish various security and compliance related issues with aws.
CO 5	Deploy applications over commercial cloud computing infrastructures such as amazon.

Mapping of CO with PO

SECE3231	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	PO11	PO12
CO 1	3	2			3				1			2
CO 2		3		2	2				2			3
CO 3	2			3							1	3
CO 4	2			2	1							2

Mapping of CO with PSO

SECE3231	PSO1	PSO2	PSO3
CO 1	3		2
CO 2	1	3	
CO 3	2		3
CO 4		2	3

Level of Revised Bloom's Taxonomy in Assessment:

1: Remember	2: Understand	3: Apply

4: Analyze	5: Evaluate	6: Create

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

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT3281
Course Name: Cyber Forensic and Investigation
Prerequisite Course(s): Cybersecurity Foundation(SECE3250)

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
2	2	0	3	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 basics of digital forensics technology, systems and services.
- learn about data recovery, data seizure, digital evidence controls and forensics analysis.
- To learn and develop different tools for digital forensic acquisition and analysis.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Digital Forensics:** Digital forensics fundamentals: Use of Computer Forensics - Benefits of Professional Forensics Methodology - Steps Taken by Computer Forensics Specialists - Case Studies - Types of Computer Forensics Technology: Military, Law Enforcement, Business - Specialized Forensics Techniques - Hidden Data and How to Find It - Protecting Data from Being Compromised - Internet Tracing Methods.	4	10
2.	**Forensics Evidence and Capture:** Data Recovery: Data Backup and Recovery, Data-Recovery Solution, Hiding and Recovering Hidden Data - Evidence Collection and Data Seizure: Collection of Evidence and Options, Obstacles – Types of Evidence - The Rules of Evidence - Volatile Evidence - Volatile Memory Forensics- Controlling Contamination: The Chain of Custody, Reconstructing the Attack.	5	20
3.	**Data Preservation and Forensics Analysis:** Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene – Computer Evidence Processing Steps - Legal Aspects of Collecting and Preserving Evidence - Computer Image Verification and Authentication - Computer Forensics Analysis: Discovery of Electronic Evidence - Identification of Data - Reconstructing Past Events - disk and file system analysis.	6	20
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Network and Operating System Forensics:** Network forensics: Investigation on virtual network and Email, Internet Artifacts – Damaging Computer Evidence - System Testing - Operating System Artifacts: Windows System Artifacts, Linux System Artifacts	5	20
5.	**Mobile and Cloud Forensics:**	6	20

	Mobile Forensics: Acquisition Procedures for Mobile, Equipment, Tools, Internet of Anything – Cloud Forensics: Service Levels, cloud vendors, Legal Challenges and Technical Challenges, Acquisition, Investigation, Tools: Open-Stack, F-Response, AXIOM.		
6.	**Forensics Tools:** Open-source tools: The Sleuth Kit (TSK) and Autopsy - SANS SIFT Investigative tool - Voltality - CAINE investigative environment - windows System Internals-Commercial tools: Encase, FTK, PRO Discover Basic, Nirsoft.	4	10
	TOTAL	30	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Analyze the memory sample and extract User ID, password, Name of the computer, and use other volatility plugins.	4
2.	Analyze the malicious process from various memory samples.	3
3.	Setup lab for android forensics environment.	3
4.	Perform a practical to bypass screen lock using ADB.	5
5.	Perform a practical to extracting data from call logs and SMS.	5
6.	Familiarize with common forensics tools like Autopsy, FTK Imager, EnCase, and Sleuth Kit.	5
7.	Investigate network traffic and identify malicious activities.	5
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Digital Forensics with Open-Source Tools: Using Open-Source Platform Tools	Cory Altheide, Harlan Carvey	Syngress

Reference Book(s):

Title	Author(s)	Publication
Computer Forensics: Computer crime Scene Investigation	John R. Vacca,	Charles River Media
Guide to Computer Forensics and Investigation	B. Nelson, A. Phillips, F. Enfinger, and C. Steuar	CENGAGE
A practical guide to computer forensic investigations",	Darren Hayes	Pearson

Web Material Link(s):

- https://www.cyberforensics.in/
- https://www.geeksforgeeks.org/cyber-forensics/
- https://www.splunk.com/en_us/blog/learn/cyber-forensics.html

Course Evaluation:

Theory:

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

SEIT3281	**CYBER FORENSIC AND INVESTIGATION**
CO 1	Understand digital forensic methodologies and evidence handling.
CO 2	Apply techniques for data recovery and forensic analysis.
CO 3	Analyze forensic data from systems, networks, and cloud environments.
CO 4	Evaluate forensic tools for investigating cyber incidents.

Mapping of CO with PO

SEIT3281	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	3	3	2	2	3	2	1	2	2	2	1	2
CO 2	3	3	3	3	3	2	2	1	2	2	1	2
CO 3	3	3	3	3	3	2	2	2	2	2	1	2
CO 4	3	3	3	3	3	2	2	2	2	2	1	2

Mapping of CO with PSO

SEIT3281	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	1	3
CO 3	3	3	2
CO 4	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	**Content**	**RBT Level**
1.	Introduction to Digital Forensics:	1,2
2.	Forensics Evidence and Capture:	1,2,4
3.	Data Preservation and Forensics Analysis:	3,4,5
4.	Network and Operating System Forensics:	4,5
5.	Mobile and Cloud Forensics:	4,5
6.	Forensics Tools:	4,5,6

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3560
Course Name: Project-I
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
0	3	-	3	-	-	100	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

Outline of the Project-I

S. No.	Task	Weightage in %
1.	Group Formation	-
2.	Title Approval and Mentor Allocation	-
3.	First Progress Report	5
4.	First Review	10
5.	Second Progress Report	5
6.	Third Progress Report	5
7.	Second Review	10
8.	Fourth Progress Report	5
9.	Fifth Progress report	10
10.	Final Report Evaluation	25
11.	Final Presentation	25
	TOTAL	**100**

Detailed Guideline(s):

Sr. No.	Content	Weightage in %
1.	**Group Formation**: Group formation requires a minimum of one member and allows for a maximum of three members per group.	-
2.	**Title Approval and Mentor Allocation:** In the initial week of the semester, students are tasked with submitting a preliminary review of their project with a suitable title. This submission includes a comprehensive synopsis and outline, accompanied by a discussion on the anticipated project outcomes. This early review acts as the foundation for the project, laying the groundwork and establishing the direction for subsequent work. Additionally, during this stage, mentors are allocated to provide guidance and support throughout the project development process.	-
3.	**First Progress Report:** Within the initial weeks of commencing the project, students are required to submit a detailed report outlining their progress, achievements, and any challenges encountered.	5

4.	**First Review:** This report serves as an early checkpoint, allowing for an assessment of whether the project is on track with the proposed timeline and objectives. Students should highlight key accomplishments, provide insights into the methodologies employed, and address any deviations from the initial plan.	10
5.	**Second Progress Report:** This report explores into the details of the progress made since the First Progress Report and First Review, offering a comprehensive overview of achievements, setbacks, and adaptations to the project plan. Students should reflect on the effectiveness of their methodologies, address any unforeseen obstacles, and demonstrate a proactive approach to overcoming challenges.	5
6.	**Third Progress Report:** At this stage, students provide a comprehensive update on the continuous evolution of their projects, demonstrating the resilience and adaptability required for successful project development. In the Third Progress Report, students delve into the nuances of their progress since the Second Progress Report, showcasing not only achievements but also a reflective analysis of the journey thus far.	5
7.	**Second Review:** During this stage, internal evaluators and expert panels engage in a comprehensive assessment of the project's overall development and achievements. The Second Review provides students with an opportunity to present their progress, methodologies, and outcomes to a panel of experts.	10
8.	**Fourth Progress Report:** In this report, students provide an updated justification of their progress, building on the insights gained from the Second Review. The Fourth Progress Report encapsulates the continuous refinement and optimization of project strategies. Students delve into the accomplishments achieved post-Second Review, addressing any recommendations made by external evaluators.	5
9.	**Fifth Progress report:** At this stage, students present a comprehensive overview of the project's evolution, encapsulating the lessons learned, achievements attained, and challenges overcome. The Fifth Progress Report serves as a reflection on the entire project lifecycle, providing insights into the iterative process of development. **The students should submit the final report to the mentor which will be further sent for evaluation**.	10
10.	**Final Report Evaluation & Final Presentation:** During this phase, students present their comprehensive Final Report, encapsulating the entire project lifecycle, methodologies employed, outcomes achieved, and lessons learned. **Final Report Evaluation:** The Final Report undergoes a thorough evaluation by faculty members and external experts. This evaluation scrutinizes the depth of content, adherence to project objectives, and the overall quality of documentation. **Final Presentation:** Students present their projects to a panel of faculty members, peers, and potentially external stakeholders. This presentation offers an opportunity to showcase the project's significance, innovation, and impact.	50
	TOTAL	**100**

Course Evaluation:

S. No.	Evaluation criteria	Marks
1.	First Progress Report	50
2.	First Review	100

3.	Second Progress Report	50
4.	Third Progress Report	50
5.	Second Review	100
6.	Fourth Progress Report	50
7.	Fifth Progress report	100
8.	Final Report Evaluation	250
9.	Final Presentation	250
	TOTAL	**1000**

The entire evaluation will be converted equivalent to 100 Marks.

Course Outcome(s):

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

SECE3560	**PROJECT-I**
CO 1	Analyze user requirements and implement innovative ideas for social and environmental benefits.
CO 2	Apply new technologies and design techniques concerned for devising a solution for a problem statement.
CO 3	Apply project management skills like task scheduling, teamwork, working in confine deadlines etc., for successfully development of the project.
CO 4	Prepare reports and presentations to communicate technical information.

Mapping of CO with PO

SECE3560	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	2	3	3	3	1	3	2	3			2	2
CO 2	3	1	1	2	3		2	3		1	2	3
CO 3			1					1	3	1	1	1
CO 4			1	1		2	1	1	1	3		3

Mapping of CO with PSO

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

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3660
Course Name: Image Processing & Steganography
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
02	02	00	03	40	60	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 image processing and techniques.
- Design and implement algorithms that perform basic image processing.
- To explore steganography methods for embedding and extracting hidden information in images.
- To understand the role of image processing and steganography in cybersecurity applications.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Digital Image Fundamentals** Fundamentals steps in digital Image Fundamentals, Human visual system, Image as a 2D data, Image representation – Grayscale and Color images, image sampling and quantization, Some basic relationships between pixels.	04	10
2.	**Image Enhancements** In spatial domain: Basic gray level transformations, Histogram processing, Using arithmetic/Logic operations, smoothing spatial filters, Sharpening spatial filters. In Frequency domain: Introduction to the Fourier transform and frequency domain concepts, smoothing frequency-domain filters, Sharpening frequency domain filters.	07	15
3.	**Image Restoration and Reconstruction** Image Degradation Models: Noise and Blur. Noise Removal Techniques: Mean, Median, and Adaptive Filters. Inverse Filtering and Wiener Filtering.	04	10
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Image Compression** Introduction, coding Redundancy, Inter-pixel redundancy, image compression methods, Lossy and Lossless compression, Huffman coding, Arithmetic coding, LZW coding, IPEG compression standard.	03	12
5.	**Introduction to Steganography** Information hiding, steganography, and watermarking, need, and application of steganography, History of watermarking and steganography, Importance of digital watermarking and steganography, Types of steganography: Text, audio, image, and	04	10

	video. Properties of Steganography and Steganalysis System.		
6.	**Image Steganography** Introduction. Text and Image steganography: Data hiding in Raw (BMP) images, LSB (Least Significant Bit) embedding, data hiding in palette (GIF) images- Palette format, hiding by decreasing color depth, GIF Shuffle. Data hiding in JPEG images: J-Steg data hiding algorithm.	06	10
7.	**Steganalysis** Principle, approaches, ROC analysis, attacks using histogram characteristics, function, spatial domain steganalysis	02	08
	TOTAL	30	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to Image Processing Toolbox.	04
2.	Read the image and perform 1. RGB to Gray image 2. RGB to Indexed image and 3. Gray to Indexed image	04
3.	Read an 8bit image and then apply different image enhancement techniques: (a) Brightness improvement (b) Brightness reduction (c) Thresholding (d) Negative of an image (e) Log transformation (f) Power Law transformation.	04
4.	Implement different interpolation techniques using MATLAB.	04
5.	Read an image, plot its histogram then do histogram equalization and comment about the result.	04
6.	(a) Implement Gray level slicing (intensity level slicing) in to read cameraman image. (b) Read an 8bit image and to see the effect of each bit on the image. (c) Read an image and to extract 8 different planes i.e. 'bit plane slicing."	06
7.	Implement various Smoothing spatial filter	04
8.	Read an image and apply (1) Gaussian 3x3 mask for burring (2) High pass filter mask with different masks (3) Laplacian operator with center value positive and negative (4) High boost filtering.	06
9.	Write a program to implement various low and high pass filters in the frequency domain.	04
10.	Introduction to Steganography tools and libraries.	
11.	Write a program to hide a secret message (in text) inside a grayscale image by modifying the least significant bit of the image pixels.	04
12.	Develop a program to encode and decode a secret message in an image using pixel intensity values.	04
13.	Study the application of steganography in secure communication and prepare a short report.	04
	TOTAL	60

Text Book(s):

Title	Author/s	Publication
Digital Image Processing	Rafael C. Gonzalez, Richard E. Woods	Pearson Education
Fundamentals Digital Image Processing	ITL Education Solutions Limited	Prentice Hall India Learning
Digital Watermarking and steganography	I.J.Cox, M.L.Miller	Morgen Kaufmann

Reference Book(s):

Title	Author(s)	Publication
Image Processing, Analysis and Machine Vision	Milan Sonka, Vaclav Hlavac, Roger Boyle	CL Engineering
Digital Image Processing	William K. Pratt	John Wiley & Sons
Steganography in Digital Media	J. Fridrich	Cambridge University Press

Web Material Link(s):

- https://nptel.ac.in/courses/106105032/
- What is Steganography? A Complete Guide with Types & Examples
- Image Steganography in Cryptography - GeeksforGeeks

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

SECE3660	IMAGE PROCESSING & STEGANOGRAPHY
CO 1	Understand fundamental image processing concepts and their applications in cybersecurity.
CO 2	Analyze and implement basic image enhancement and restoration techniques.
CO 3	Design and evaluate image-based steganographic techniques for secure communication.
CO 4	Apply steganalysis techniques to detect and prevent hidden information misuse.

Mapping of CO with PO

SECE3660	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	3	3	2			2						
CO 2	3	3	3	2	2	2						
CO 3	3	3	3	3	3	3	2					
CO 4	3	3	3	3	3	2	2	2	3	2	2	3

Mapping of CO with PSO

SECE3660	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	3	2
CO 3	3	3	3
CO 4	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Introduction to Digital Image Fundamentals	1,2
2.	Image Enhancements	1,2,4
3.	Image Restoration and Reconstruction	3,4
4.	Image Compression	3,4
5.	Introduction to Steganography	2,3
6.	Image Steganography	3,5,6
7.	Steganalysis	4,5,6

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT3640
Course Name: Advanced Web Technologies
Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Write backend code in Python/Java, PHP languages and writing optimized front end code HTML and JavaScript.
- Understanding MVC architecture in Web based applications, with Advanced PHP concepts and Laravel Framework along with Node.js and Angular js.
- Give basic understanding of URL methods, MVC Framework, Unit Testing, Web Services, API Node Servers, and routing.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**PHP** Introduction to PHP and its syntax, combining PHP and HTML, understanding PHP code blocks like Arrays, Strings, Functions, looping and branching, file handling, processing forms on the server side, cookies, and sessions.	08	10
2.	**Object-Oriented PHP** Object-Oriented Programming with PHP – Classes, Properties, Methods, Constructor, Destructor, Getters and Setters, Encapsulation, Inheritance, Data Abstraction, Polymorphism.	08	20
3.	**PHP & MySQL** Introduction to PHPMyAdmin, connection to MySQL server from PHP, execution of MySQL queries from PHP, receiving data from the database server, and processing it on the webserver using PHP. Web Scraping using cURL, Regular Expressions, Mail functions, Web Services, and APIs.	06	20
Section II			
Module No.	Content	Hours	Weightage in %
4.	**PHP MVC Framework – Laravel** Introduction to Laravel and MVC, Environment Setup, Routes, Namespaces, Controllers, Views, Blade Templates, Migrations, Request-Response cycle, Redirections, Forms, Sessions, Cookies, Database Connectivity, and CRUD operations.	09	15
5.	**Node.js and Angular** Basic web development, environmental setup, callbacks, node package manager (NPM) utilization, streams and buffers, Express	08	15

	framework basics, MongoDB basics, and REST API creation. Setup Node.js with Angular.		
6.	**Web Sockets** Introduction to Web Sockets, Web Socket URIs, Web Socket APIs, Opening Handshake, Data Framing, Sending and Receiving Data, Closing Connections, Error Handling, and Web Socket Security.	06	20
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Install and Configure PHP and MySQL	04
2.	Develop a Simple Web Page in PHP Using Class, Object, Inheritance, and Function	02
3.	Develop a Web Application in PHP Using Constructor and Destructor	02
4.	Write a PHP Program to Calculate Date and Time Functions	02
5.	Create a Web Page to Advertise a Product of the Company Using Images and Audio	02
6.	Create a PHP Page for Login System Using Session	02
7.	Create a Web Page for a Travel Agency with Database Connectivity	02
8.	Develop a Small Project Using the Laravel Framework	04
9.	Develop a Web Application as a Mini Project Using Node.js	10
	TOTAL	**30**

Text Book (s):

Title	Author/s	Publication
Black Book, Web Technologies	Kogent Learning Solutions Inc	Dreamtech Press
Full Stack Web Development for Beginners	Riaz Ahmed	Atlantic publisher

Reference Book (s):

Title	Author/s	Publication
Web Technologies-A Computer Science Perspective	Jeffrey C. Jackson	Pearson Education
AngularJS: Up and Running Enhanced Productivity with Structured Web Apps	Brad Green, Shyam Seshadri	O'Reilly Media
Learning React Functional Web Development with React and Redux	Alex Banks, Eve Porcello	O'Reilly Media

Web Material Link(s):

- https://www.w3schools.com/whatis/whatis_fullstack.asp
- https://www.geeksforgeeks.org/web-technology/

Course Evaluation:

Theory:

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

Practical:

- Continuous Evaluation Consist of Performance of Practical which will be evaluated out of 20 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 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:

SEIT3640	ADVANCED WEB TECHNOLOGIES
CO1	Identify the basic concepts of web & markup languages.
CO2	Develop web applications using scripting languages & frameworks.
CO3	Creating controller working with and displaying in angular js and nested forms with ng-form.
CO4	Working with the files in react js and constructing elements with data.
CO5	Develop dynamic web pages with usage of server-side scripting NodeJS and MongoDB.

Mapping of CO with PO

SEIT3640	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1		3	3	2	3	2		3	1			1
CO 2		3	3	2	3	2		3	3		2	2
CO 3		3	3	2	3	2		3	3		3	3
CO 4		3	3	2	3	2		3	3		2	3
CO 5		3	3	2	3	2		3	3		3	3

Mapping of CO with PSO

SEIT3640	PSO1	PSO2	PSO3
CO 1	2	2	1
CO 2	1	3	3
CO 3	3	3	3
CO 4	3	3	3
CO 5	3	3	3

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	PHP	1,2,3
2	Object Oriented PHP	2,3
3	Advance PHP	2,3,6
4	PHP MVC Framework – Laravel	2,3
5	PHP & MySQL	2,3,4,6
6	Web Sockets	2,3,4,6

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT3650
Course Name: Augmented Reality and Virtual Reality
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	
2	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 principles, architecture, and components of AR and VR systems and their applications in real-world scenarios.
- Design and develop basic AR/VR applications using appropriate tools and technologies for immersive user experiences.
- Analyze the challenges and limitations of AR/VR systems, including hardware, software, and user interaction considerations.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Augmented Reality (AR)** History of AR - Augmented reality characteristics, Difference between Augmented Reality and Virtual Reality, AR technological components, Technologies used in AR, Feature Extraction, Hardware component, AR devices, Importance of AR, Real world uses of AR – AR types, Software tools available for AR.	03	12
2.	**AR Hardware and Software** Sensory hardware; Limitations and interactions; AR and VR together; Introduction to AR headset and smart glasses; Various AR software available; Introduction to Spark AR; Create a face detection app	04	15
3.	**Technology Integration and Implementation of AR** Technology use and integration in industrial settings, Assistive training to faculty members, Planning and administration for implementation, AR implications.	05	15
4.	**Augmented Reality and Virtual Reality for Micro Learning** Micro learning techniques, Utilizing VR for learning, VR for Practical online assessment, VR info graphics, Virtual case considerations, Utilizing AR for learning, Accessible learning, sensible data elevated learner engagement, VR technology, Components of VR, VR Hardware, VR applications, Civil Engineering, Real Estate, Biology and Medicine, Virtual Mall, VR in Education, Virtual Laboratory, Factory Planning, Automobile Industry.	05	15
Section II			
Module No.	Content	Hours	Weightage in %
5.	**VR Development Tools and Frameworks**	04	16

	Introduction to VR development platforms (Unity, Unreal Engine), Creating 3D environments for VR, Basics of VR interactions and animations, Integration of audio and spatial effects in VR		
6.	**Interaction Techniques in AR/VR** Interaction design principles for AR/VR, Gesture recognition and tracking, Voice and eye-tracking in AR/VR systems	05	15
7.	**AR/VR Project Implementation** Project planning and development lifecycle, Designing an end-to-end AR/VR solution, Presentation and evaluation of projects	04	12
	TOTAL	30	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to Spark and the Fundamentals Function	04
2.	Create a Face Detection App using spark.	08
3.	Introduction to Unity and its installation.	04
4.	Introduction to AR foundation; Installing AR foundation SDK; SDK setup	10
5.	Introduction to C-sharp and its Basics	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Innovating with Augmented Reality: Applications in Education and Industry	Taylor & Francis Group	CRC Press,
Understanding Virtual Reality: Interface, Application and Design	William R Sherman and	Understanding Virtual Reality: Interface, Application and Design

Reference Book(s):

Title	Author(s)	Publication
Designing Virtual Systems: The Structured Approach"	Gerard Jounghyun Kim	WILEY
"3D User Interfaces, Theory and Practice	Doug A Bowman, Ernest Kuijff, Joseph J LaViola	Addison Wesley

Web Material Link(s):

- https://nptel.ac.in/courses/106/106/106106138/
- https://www.coursera.org/learn/introduction-virtual-reality

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

SEIT3650	Augmented Reality and Virtual Reality
CO 1	Develop a strong understanding of AR/VR concepts, technologies, and applications across various industries, enhancing career prospects.
CO 2	Gain proficiency in AR/VR development tools and frameworks, enabling the creation of interactive and immersive experiences.
CO 3	Acquire skills in designing user interactions, integrating 3D models, and optimizing AR/VR applications for diverse platforms and devices.
CO 4	Address challenges in AR/VR deployment, including ethical considerations and privacy concerns, while exploring future trends like XR and MR.

Mapping of CO with PO

SEIT3650	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	3	3		1	3					2	3	1
CO 2	2	3	3		3	2		1				1
CO 3	2	3	2	1	2	3		1	2	2	3	1
CO 4	3	2	2			2			3	2		1
CO 5	3	3	1		2					1	3	1

Mapping of CO with PSO

SEIT3650	PSO1	PSO2	PSO3
CO 1	3	3	1
CO 2	2	1	3
CO 3	1	2	
CO 4	3	1	1
CO 5	2	2	3

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Introduction to Augmented Reality (AR)	2,4
2.	AR Hardware and Software	2,3,4
3.	Technology Integration and Implementation of AR	2,4.5
4.	Augmented Reality and Virtual Reality for Micro Learning	1,2,5
5.	VR Development Tools and Frameworks	2,3,4,6
6.	Interaction Techniques in AR/VR	2,3,5
7.	AR/VR Project Implementation	2,3

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT3680
Course Name: Disaster Recovery and Business Continuity Management
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	
2	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 fundamental concepts of disaster recovery (DR) and business continuity management (BCM).
- Enable students to design, implement, and maintain comprehensive disaster recovery and business continuity plans.
- Provide practical experience in managing disruptions through hands-on labs, case studies, and simulation exercises.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Disaster Recovery and Business Continuity** Overview of DR and BC, Key Terminologies, and Importance in IT and Enterprise, Regulatory Standards (ISO 31000, ISO 22301) and Evolution of BC/DR Practices.	03	12
2.	**Business Continuity Management (BCM)** Principles of BCM, Lifecycle, and Framework, Governance, Policy Development, and Team Structure, Roles and Responsibilities in BCM.	04	15
3.	**Risk Assessment and Business Impact Analysis (BIA)** Conducting Risk Assessments and Identifying Critical Processes, Risk Mitigation Strategies and Business Impact Analysis Methodology, Quantitative and Qualitative Impact Metrics.	05	15
4.	**Disaster Recovery Planning** Steps to Develop DR Plans, Policies, and Procedures, Defining RTO, RPO, and Selection of Disaster Recovery Sites, Integration of BC/DR with Organizational Strategy.	05	15
Section II			
Module No.	Content	Hours	Weightage in %
5.	**Data Backup and Recovery Strategies** Data Backup Techniques (Full, Incremental, Differential) and Storage Solutions, Recovery Techniques and Data Security Considerations, Virtualization-Based Disaster Recovery.	04	16
6.	**System Recovery and Testing** Centralized vs. Decentralized Recovery and IT Infrastructure Recovery, Disaster Recovery Testing, Simulation, and Evaluation, Training and Awareness Programs.	05	15

7.	**Emerging Trends in BC/DR** Use of Virtualization for BC/DR, Cybersecurity Considerations in BC/DR, Case Studies and Real-World Applications	04	12
	TOTAL	30	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Simulate disaster scenarios and develop a basic disaster recovery plan for a small IT organization.	03
2.	Conduct a risk assessment for an IT infrastructure using simple tools and techniques to identify vulnerabilities.	03
3.	Perform a business impact analysis to prioritize critical operations and estimate downtime costs in a sample case study.	03
4.	Create and implement a basic data backup strategy using local storage and cloud platforms.	03
5.	Restore data from backup and evaluate the effectiveness of the recovery process under simulated disaster conditions.	03
6.	Design a virtualized disaster recovery environment and test failover mechanisms using open-source virtualization tools.	03
7.	Develop a centralized system recovery plan for critical business applications and simulate a recovery process.	03
8.	Test a sample disaster recovery plan by simulating a server failure and evaluate the recovery time objectives.	03
9.	Identify and map roles and responsibilities for a business continuity team in a mock organization setup.	03
10.	Analyze case studies on disaster recovery failures and propose actionable improvements for prevention and resilience.	03
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Business Continuity and Disaster Recovery Planning for IT Professionals	Susan Snedaker	Syngress Media,U.S.
Disaster Recovery and Business Continuity	Thejendra Sreenivas	IT Governance Publishing

Reference Book(s):

Title	Author(s)	Publication
Disaster Recovery Procedures for Business Continuity Management (Professional's Ready-To-Use Procedure)	Bizmanualz	Bizmanualz, Inc.
Business Continuity and Disaster Recovery for InfoSec Managers	John W. Rittinghouse	Digital Press

Web Material Link(s):

- https://www.youtube.com/@dcencompass

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

SEIT3680	DISASTER RECOVERY AND BUSINESS CONTINUITY MANAGEMENT
CO 1	Develop skills to design, implement, and manage effective disaster recovery and business continuity plans for organizational resilience.
CO 2	Analyze and assess risks to identify critical business functions and create strategies to mitigate potential disruptions effectively.
CO 3	Demonstrate proficiency in utilizing tools and techniques for data backup, recovery, and system restoration in disaster scenarios.
CO 4	Apply industry standards and regulatory frameworks to ensure compliance in business continuity and disaster recovery practices.

Mapping of CO with PO

SEIT3680	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	3	3		1	3					2	3	1
CO 2	3	2			3							1
CO 3	3	2	1	3	3					2	3	1
CO 4	3	2				3			3	2		1
CO 5	3	3	1		2					1	3	1

Mapping of CO with PSO

SEIT3680	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	2	2	3
CO 3	3	2	
CO 4	3	2	1
CO 5	2	2	3

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Introduction to Disaster Recovery and Business	1,2

	Continuity	
2.	Business Continuity Management (BCM)	1,2,3,6
3.	Risk Assessment and Business Impact Analysis (BIA)	3,4,5
4.	Disaster Recovery Planning	2,3,4,6
5.	Data Backup and Recovery Strategies	2,3,4,6
6.	System Recovery and Testing	2,3,5
7.	Emerging Trends in BC/DR	2,3

Course Code: TNPC3010
Course Name: Corporate Grooming & Etiquette
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
01	02	00	02	0	0	50	50	--	--	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

Course Content:

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

List of Practical:

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

Reference Book(s):

Title	Author/s	Publication
Grooming and Etiquette for Corporate Men and Women	John Chibaya Mbuya	2009

Effective Communication Skills for Public Relations	Andy Green	Kogan Page, 2006
Personality Development and Soft Skills	Barun Mitra	Oxford University Press, 2016
The EQ Edge: Emotional Intelligence and Your Success	Stein, Steven J. & Howard E. Book	Wiley & Sons, 2006.
Cross Cultural Management: Concepts and Cases	Madhavan	Oxford University Press, 2016
Corporate Grooming and Etiquette	Sarvesh Gulati	Rupa Publications India Pvt. Ltd., 2012
Behavioral Science: Achieving Behavioral Excellence for Success	Dr. Abha Singh	John Wiley & Sons, 2012

Course Evaluation:
Practical

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

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

TNPC3010	**CORPORATE GROOMING & ETIQUETTE**
CO 1	Understand the importance of professional etiquettes and ways to improve the same.
CO 2	Gain the knowledge and practice of skill sets required in corporate set up.
CO 3	Learn personal management skills in the organizational context.
CO 4	Develop an awareness about the corporate etiquettes.
CO 5	Understand the importance of self-grooming

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	Corporate Grooming	1,2,3,4,5
2	Personal Skills	1,2,3,4,5,6
3	Management Skills	1,2,3,4,5
4	Organizational Etiquettes	2,3,4,5

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE3490
Course Name: MOOC Course / University Elective
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	-	-	03	100	-	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

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

1. Deep Learning
2. Computer Graphics
3. Computer Vision
4. Design Engineering
5. Neural Networks
6. Applied Natural Language Processing
7. Social Networks
8. Virtual Reality
9. Augmented Reality
10. Real time systems
11. Big Data
12. Advanced graph theory
13. Theory of computation
14. Design And Engineering Of Computer Systems
15. Ethical Hacking
16. UI & UX
17. Data Analytics
18. Data Visualization
19. Algorithms For Big Data
20. Compiler Design

Or any other MOOC course; available time to time.

Course Evaluation:
Practical:

- Continuous Evaluation as per the guidelines of Course assignments/Internal Exams.
- The Course assignments/Internal Exams score will be directly fetched and converted out of 100.

Course Outcome(s):

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

SECE3490	MOOC COURSE / UNIVERSITY ELECTIVE
CO 1	Inculcate mode of self-learning.
CO 2	Exposure to relevant and newest tools and technologies.
CO 3	Value addition when the student is applying for jobs.
CO 4	Use MOOC program for GATE and high studies preparation.
CO 5	Facilitate students to attain certificate and to make them employable in the industry or pursue higher education program.

Mapping of CO with PO

SECE3490	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1		1		2	1	1		1			1
CO 2	1		2	2	2				1	1		2
CO 3		2	2	2	2			1		2		
CO 4	2	1		1	1	1				1		2
CO 5						1		1		2		3

Mapping of CO with PSO

SECE3490	PSO1	PSO2	PSO3
CO 1	2	2	3
CO 2	3	2	2
CO 3	2	3	3
CO 4	3	3	2
CO 5	3	3	3

FOURTH YEAR B. TECH.

P P SAVANI UNIVERSITY																	
SCHOOL OF ENGINEERING																	
TEACHING & EXAMINATION SCHEME FOR SECOND YEAR B.TECH. INFORMATION TECHNOLOGY PROGRAMME AY: 2023-24																	
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	
7	SECE4960	Project/Training	RP/OJT	CE	0	24	0	24	24	0	0	200	300	0	0	500
							Total	**24**	**24**							**500**
8	SECE4251	Cloud Security	Major/Core	CE	2	2	0	4	3	40	60	40	60	0	0	200
	SECE4261	Blockchain Technology	Major/Core	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SECE4271	Ethical Hacking	Major/Core	CE	0	4	0	4	2	0	0	40	60	0	0	100
	SECE4560	Project-II	Minor	CE	0	3	0	3	3	0	0	100	0	0	0	100
		Elective-III	Minor		2	2	0	4	3	40	60	40	60	0	0	200
	TNPC3020	Creativity, Problem Solving & Innovation	SEC	TNPC/SOE	2	0	0	2	2	100	0	0	0	0	0	100
							Total	**19**	**21**							**900**

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

TEACHING & EXAMINATION SCHEME FOR B. TECH. BATCH : 2023 COMPUTER SCIENCE & ENGINEERING – CYBER SECURITY – ELECTIVE COURSES

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	
7	SEIT4610	DevOps and Agile Foundation	Minor	IT	2	2	0	4	3	40	60	40	60	0	0	200
7	SEIT4640	Automata Theory & Language Processor	Minor	IT	2	2	0	4	3	40	60	40	60	0	0	200
7	SEIT4680	Information Security Analysis and Audit	Minor	IT	2	2	0	4	3	40	60	40	60	0	0	200
7	SEIT4660	Artificial Intelligence	Minor	IT	2	2	0	4	3	40	60	40	60	0	0	200

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE4960
Course Name: Project/Training
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
-	24	-	24	-	-	200	300	-	-	500

CE: Continuous Evaluation, ESE: End Semester Exam

Outline of the Project/Training:
Project

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

Training

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

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

SECE4960	PROJECT/TRAINING
CO 1	Support the theoretical learning with practice and integrate knowledge for engineering applications
CO 2	Adapt to real time industry exposure and experience
CO 3	Solve challenging projects for commercial, societal and environment benefit.
CO 4	Explain the importance of planning, documentation, punctuality and work ethics.
CO 5	Document the work which is carried out in proper format with industry standards.

Mapping of CO with PO

SECE4960	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3		3			2	3				3
CO 2			3		3			3	3	3		3
CO 3		3					3	2		2		3
CO 4	2			2			3	3	2			3
CO 5								3	2			3

Mapping of CO with PSO

SECE4960	PSO1	PSO2	PSO3
CO 1	3	3	2
CO 2	3	3	2
CO 3	3	3	3
CO 4	3	3	3
CO 5	3	3	3

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE4251
Course Name: Cloud Security
Prerequisite Course(s):

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
2	2	0	3	40	60	40	60	0	0	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

- To Understand fundamental cloud security concepts and architectures.
- To Apply security controls to protect cloud identities, data, and networks.
- To Respond to cloud threats through monitoring, compliance, and best practices.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Cloud Computing & Security Foundations** Cloud computing concepts, characteristics & service models (IaaS/PaaS/SaaS), Deployment models (Public/Private/Hybrid/Multi-cloud), Virtualization & container fundamentals, Cloud threat landscape (OWASP Cloud Top Risks), Shared Responsibility Model (AWS/Azure/GCP)	04	13
2.	**Governance, Risk, Compliance & Legal Aspects** Cloud security governance & policies, Risk analysis for cloud workloads, Compliance frameworks: ISO 27001/27017/27018, NIST 800-53, CSA CCM, Data residence, data sovereignty & regulatory laws (GDPR overview), Cloud security posture management (CSPM)	04	12
3.	**Identity, Access & Zero Trust Security** IAM fundamentals: RBAC, ABAC, PBAC, Identity federation (SAML, OAuth 2.0, OpenID Connect), Multi-factor Authentication, SSO, Zero Trust Architecture, Identity governance in AWS IAM / Azure AD / GCP IAM	03	15
4.	**Cloud Network & Infrastructure Security** Virtual networks: VPC/VNet, subnets, routing, Network security controls: Security Groups, NACLs, firewalls, API security & API Gateway security, DDoS protection (AWS Shield / Cloud Armor), Encryption in Transit (TLS), VPNs, Private Connectivity, Workload security: VM hardening, patching	05	13
5.	**Cloud Application Security & DevSecOps** Secure SDLC for cloud-native applications, API security (JWT,	04	10

	OAuth), CI/CD pipeline security, Serverless function security (AWS Lambda, Azure Functions), Introduction to container & Kubernetes security, Secrets management & key rotation		
6.	**Data Security & Privacy in Cloud** Data lifecycle in cloud, Data classification, labeling & DLP, Cloud-native encryption: SSE, CSE, KMS, HSM, Data masking, tokenization, anonymization, Cloud database/storage security best practices	03	10
7.	**Cloud Monitoring, Logging & Security Operations** Logging & monitoring (CloudTrail, CloudWatch, Azure Monitor, GCP Logging), SIEM/SOAR in cloud (Splunk, Sentinel, Chronicle), Threat detection, alerting & correlation, Vulnerability scanning tools (Inspector, Security Center)	03	15
8.	**Cloud Incident Response, Forensics & Resilience** Incident response lifecycle in cloud, Evidence acquisition & forensic challenges, Business continuity & disaster recovery (RTO/RPO), Cloud architecture resiliency patterns, Case studies: Capital One breach, S3 misconfiguration, Cloud security best practices (CIS Benchmarks, CSA Guidelines)	04	12
	TOTAL	**30**	**100**

List of Practical:

Sr. No	Name of Practical	Hours
1.	Introduction to Cloud Console and Service Navigation (AWS/Azure/GCP)	02
2.	Deploying and Securing Virtual Machine Instances	02
3.	Identity and Access Management: Creating Users, Groups, and Roles	02
4.	Configuring Multi-Factor Authentication and SSO	02
5.	Implementing Access Control Policies (RBAC/ABAC)	02
6.	Designing a Secure Virtual Network (VPC/VNet, Subnets, Routing)	02
7.	Configuring Security Groups, Firewalls, and Network ACLs	02
8.	Securing Object Storage: Buckets, Access Policies & Encryption	02
9.	Encryption Key Management using KMS / HSM	02
10.	Logging and Monitoring Setup (CloudTrail / CloudWatch / Azure Monitor)	02
11.	Configuring Web Application Firewall (WAF) and API Gateway Security	02
12.	Securing CI/CD Pipeline and Secret Management	02
13.	Container Security Basics (Docker Image Scanning & Hardening)	02
14.	Vulnerability Scanning and Cloud Security Auditing Tools	04
	TOTAL	**30**

Text Book(s):

Title	Author/s	Publication
Cloud Security and Privacy	Tim Mather, Subra Kumaraswamy, and Shahed Latif	, O'Reilly Media.

Reference Book(s):

Title	Author/s	Publication
Cloud Security: A Comprehensive Guide to Secure Cloud Computing	Ronald L. Krutz & Russell Dean Vines	Wiley
Cloud Security and Compliance: A Practical Guide	Rick Blaine	Packt Publishing

Web Material Link(s)

- https://www.coursera.org/learn/ccsp1

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 consists of 60 marks.

Practical/Tutorial:

- Continuous Evaluation consists of performance of Practical/Tutorial 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/drawing/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 student will be able to

SECE4251	Cloud Security
CO1	Understand cloud computing models, architectures, and fundamental security principles.
CO2	Apply security mechanisms to protect cloud resources including identity, access, network, and data.
CO3	Analyze cloud security risks, compliance requirements, and governance frameworks.
CO4	Use monitoring, logging, and automated security tools to detect and respond to cloud threats.
CO5	Evaluate and implement best practices for resilient, secure, and compliant cloud environments.

Mapping of CO with PO

SECE4251	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2										2
CO 2	3	3			3							2
CO 3			3		3				2	2	2	3
CO 4	3	3	2	2	2							2
CO 5			2			3	2	3		2		3

Mapping of CO with PSO

SECE4251	PSO 1	PSO 2	PSO 3
CO1	3	2	1
CO2	3	3	1
CO3	3	3	1
CO4	3	3	1
CO5	3	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.	Cloud Computing & Security Foundations	1, 2
2.	Governance, Risk, Compliance & Cloud Trust	2, 3
3.	Identity & Access Management & Zero Trust	3, 4
4.	Cloud Network & Infrastructure Security	3, 4
5.	Cloud Application Security & DevSecOps	3, 5
6.	Data Security, Encryption & Privacy Engineering	2, 3, 4
7.	Cloud Monitoring, Logging & Threat Detection	3, 4, 5
8.	Cloud Incident Response, Forensics & Resilience	4, 5, 6

P P Savani University

School of Engineering

Department of Computer Engineering

Course Code: SECE4261
Course Name: Blockchain Technology
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 understand the fundamentals and architecture of blockchain systems.
- To analyze cryptographic methods, consensus mechanisms, and smart contracts.
- To evaluate blockchain applications, security issues, and emerging trends.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Blockchain Technology** Genesis & evolution of blockchain systems (Bitcoin origin) , What is a blockchain? ledger, blocks, immutability, decentralization, Distributed ledger technology (DLT) basics – ledgers, blocks, nodes, transactions, time-stamping, Public vs permissioned blockchains, Applications beyond cryptocurrency: e-governance, supply-chain, identity management	06	13
2.	**Cryptographic Primitives & Blockchain Components** Cryptographic hash functions, digital signatures, Merkle trees, Block structure, transaction life-cycle, P2P networks, distributed ledger basics, decentralization model, Trust models and adversarial considerations	07	12
3.	**Consensus Mechanisms & Blockchain Architecture** Proof-of-Work (PoW), Proof-of-Stake (PoS) and other consensus models: DPoS, PBFT, PoA, PoSpace, Permissionless vs permissioned consensus, Architecture of enterprise blockchains, Hyperledger, state-machine replication	06	15
4.	**Smart Contracts, DApps & Platforms** Smart contract fundamentals: Solidity, EVM, deployment on Ethereum, Permissioned smart contract platforms: Hyperledger Fabric architecture, Decentralised applications (DApps) and tooling overview, Hyperledger Fabric smart contract development (Chaincode), membership service provider (MSP), channels, peers, orderers	08	13

5.	**Blockchain Security, Privacy & Interoperability** Security threats in blockchain: forks, 51% attack, double spending, Privacy concerns: anonymity, pseudonymity , Blockchain interoperability: cross-chain, sidechains, bridges	05	10
6.	**Standards, Regulation & Legal Aspects** Regulatory frameworks for blockchain and cryptocurrencies , Data protection, compliance issues in distributed ledger systems, Standards in blockchain systems and enterprise adoption	04	10
7.	**Blockchain Use-Cases & Industry Applications** Financial services: cross-border payments, trade finance, Supply chain, provenance, healthcare, identity management, Emerging domains: IoT + blockchain, energy sector	05	15
8.	**Emerging Trends & Future Directions** Blockchain + AI/ML, IoT integration, Decentralised identity, tokenisation of assets, Challenges & research directions: scalability, quantum-resilience, Case study on recent blockchain Application	04	12
	TOTAL	**45**	**100**

List of Practical:

Sr. No	Name of Practical	Hours
1.	Study of blockchain concepts and Ethereum installation.	02
2.	Implement hashing and Merkle tree operations using Python.	02
3.	Analyze Bitcoin block data and transaction structure.	02
4.	Implement Proof-of-Work using Python (simple simulation).	02
5.	Explore Ethereum wallet creation and account management.	02
6.	Introduction to Solidity: Syntax, data types, basic contract.	02
7.	Write and deploy a simple smart contract on Remix IDE.	02
8.	Implement events and functions in Solidity contracts.	02
9.	Develop a token-based smart contract (ERC-20 basics).	02
10.	Case study: Supply chain tracking on blockchain.	02
11.	Case study: Blockchain for healthcare data management.	02
12.	Study of Hyperledger Fabric architecture and components.	02
13.	Comparison of public vs private blockchain with examples.	02
14.	Mini Project: Build and present a blockchain use-case prototype.	04
	TOTAL	**30**

Text Book(s):

Title	Author/s	Publication
Mastering Blockchain: Deeper Insights into Decentralization, Cryptography, Bitcoin, and Popular Blockchain Frameworks	Mohan Bashir	Apress

Reference Book(s):

Title	Author/s	Publication
Blockchain: Principles and Practices	Narayan Prusty	Packt Publishing
Blockchain for Business with Hyperledger Fabric: A decentralized architecture for autonomous business networks	Pradeep Kumar Poojari (ed.)	O'Reilly Media

Web Material Link(s)

- https://onlinecourses.nptel.ac.in/noc22_cs44/preview
- https://www.coursera.org/courses?query=blockchain

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 consists of 60 marks.

Practical/Tutorial:

- Continuous Evaluation consists of performance of Practical/Tutorial 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/drawing/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 student will be able to

SECE4261	Blockchain Technology
CO1	Understand the fundamental concepts, architecture, and components of blockchain technology.
CO2	Describe cryptographic techniques and consensus mechanisms used in blockchain systems.
CO3	Develop and deploy basic smart contracts and decentralized applications on blockchain platforms.
CO4	Analyze blockchain security issues, privacy concerns, and performance challenges.
CO5	Assess real-world blockchain applications, legal frameworks, and emerging technological trends.

Mapping of CO with PO

SECE4261	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	1		2							2
CO 2	3	3	2	2	3							2
CO 3	2	2	3	2	3				1	1		2
CO 4	2	3	2	3	2	2		2				3
CO 5	2	2	2	2	2	3	2	3	1	2		3

Mapping of CO with PSO

SECE261	PSO 1	PSO 2	PSO 3
CO1	2	2	1
CO2	3	3	1
CO3	2	3	2
CO4	3	3	1
CO5	2	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.	Introduction to Cyber Security	1, 2
2.	Cryptographic Primitives & Blockchain Components	2, 3
3.	Consensus Mechanisms & Blockchain Architecture	3, 4
4.	Smart Contracts, DApps & Platforms	3, 5
5.	Blockchain Security, Privacy & Interoperability	4, 5
6.	Standards, Regulation & Legal Aspects	2, 4
7.	Blockchain Use-Cases & Industry Applications	4, 5
8.	Emerging Trends & Future Directions	2, 6

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE4271
Course Name: Ethical Hacking
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	
0	4	0	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

- To learn practical skills for identifying and testing security vulnerabilities.
- To perform hands-on penetration testing using ethical hacking tools.
- To understand ethical and legal responsibilities in cybersecurity.

List of Practical:

Sr. No	Name of Practical	Hours
1.	To create a secure and isolated environment using VirtualBox/VMware and Kali Linux for ethical hacking activities.	02
2.	To learn essential Linux commands required for cybersecurity and penetration testing operations.	02
3.	To capture, filter, and analyze network packets using Wireshark.	02
4.	To gather publicly available information about a target using tools like whois, nslookup, and theHarvester.	02
5.	To identify live hosts, open ports, running services, and operating systems using Nmap.	02
6.	To detect vulnerabilities in network systems using automated vulnerability scanners.	02
7.	To analyze password hashes and test password strength using cracking tools.	02
8.	To perform brute-force login attempts on services like SSH/FTP.	02
9.	To identify, select, and execute exploits using the Metasploit Framework.	02
10.	To generate malicious payloads and understand how they work in a controlled environment.	02
11.	To perform ARP spoofing and intercept network traffic in a man-in-the-middle attack scenario.	02
12.	To exploit SQL Injection vulnerabilities using manual and automated techniques.	04
13.	To perform stored and reflected XSS on vulnerable web pages.	02
14.	To identify hidden directories and files on a web server for security assessment.	04
15.	To capture WPA/WPA2 handshake packets and test Wi-Fi password security.	02
16.	To bypass firewalls using fragmented packets and decoys with Nmap.	02

17.	To analyze system and network logs to identify malicious activity.	02
18.	To analyze malicious files safely using isolated virtual environments.	02
19.	To identify insecure configurations and permissions in cloud environments using online tools.	04
20.	To perform a complete penetration test on a controlled system and prepare a professional security report.	04
	TOTAL	**60**

Text Book(s):

Title	Author/s	Publication
Gray Hat Hacking: The Ethical Hacker's Handbook, Fifth Edition	Daniel Regalado, Shon Harris, Allen Harper, Chris Eagle, Jonathan Ness, Branko Spasojevic, Ryan Linn, Stephen Sims	McGraw Hill Professional, 2018

Reference Book(s):

Title	Author/s	Publication
Ethical Hacking: A Hands-On Introduction to Breaking In	Daniel G. Graham	No Starch Press, 2021

Web Material Link(s)

- https://www.coursera.org/learn/ethical-hacking-with-kali-linux
- https://www.coursera.org/specializations/packt-the-complete-ethical-hacking-course

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 consists of 60 marks.

Practical/Tutorial:

- Continuous Evaluation consists of performance of Practical/Tutorial 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/drawing/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 student will be able to

SECE4271	Ethical Hacking
CO1	Identify and evaluate security vulnerabilities in computer systems, networks, and applications.
CO2	Apply ethical hacking tools and methodologies to perform penetration testing in a controlled environment.
CO3	Analyze and interpret captured network traffic to detect malicious activities and security

	breaches.
CO4	Exploit and mitigate common web application vulnerabilities such as SQL Injection, XSS, and authentication flaws.
CO5	prepare professional security assessment reports with recommendations for improving system security

Mapping of CO with PO

SECE4251	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3		2	3	1	1					1
CO 2	3	3	2	3	3	1	1					1
CO 3	3	3		3	3	1	1					1
CO 4	3	2	3	3	3	1	1					1
CO 5						2	2	3	3	3	2	3

Mapping of CO with PSO

SECE4251	PSO 1	PSO 2	PSO 3
CO1	3	2	1
CO2	3	3	1
CO3	3	2	1
CO4	3	3	1
CO5	2	2	3

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

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

P P Savani University
School of Engineering
Department of Computer Engineering

Course Code: SECE4560
Course Name: Project-II
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
-	03	-	03	-	-	100	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

Outline of the Project-II:

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

Detailed Guideline(s):

Sr. No	Content
1.	**Selection of Title** Select a topic according to the specialization of students or future technology. After selecting the topic and proposed title, get approval from the concerned faculty.
2.	**Literature Review** Study of various technology or area to select a topic of the project.
3.	**Gap identification and Proposal** Students must identify the gaps in the existing research and design a proposal which will help in overcome the same.
4.	**Implementation** Students must implement their proposal in any of the programming languages.
5.	**Report Writing** The report must be prepared as per suggested guidelines consisting of Preamble, Objectives, Scope, Introduction, Conclusions, Recommendations and Annexure.
6.	**Presentation & Question-Answer**

	At the end of the semester, the student/group of students shall give a presentation of their work followed by a viva-voce examination.

Course Evaluation:

Sr. No.	Evaluation criteria	Marks
1.	Selection of the topic related field (Within first 30 Days of commencement of semester)	25
2.	Initial Presentation of the topic (Within 31 to 40 Days of commencement of semester)	25
3.	An actual work carried out (Within 41 to 60 Days of commencement of semester)	25
4.	Report writing as per guidelines	25
5.	Final Presentation & Question-Answer session	25
	Grand Total:	**100**

The entire evaluation will be converted equivalent to 200 Marks.

Course Outcome(s):

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

SECE4560	PROJECT-II
CO 1	Distinguish and analyze the issues related to various existing system.
CO 2	Experiment on problem with the help of latest technologies.
CO 3	Utilize and implement knowledge in the application development.
CO 4	Facilitate society with recent technological advancement.

Mapping of CO with PO

SECE4560	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3		2				3	2			3
CO 2			3		3			2	3			3
CO 3	2	2			2			3	3	2		3
CO 4	3			3					2			3

Mapping of CO with PSO

SECE4560	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT4610
Course Name: DevOps and Agile Foundation
Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Understand Agile values, principles, and practices.
- Apply DevOps principles to shorten feedback loops and improve delivery.
- Gain practical knowledge of CI/CD, containerization, Infrastructure as Code, and monitoring.
- Build the ability to plan, execute, and improve agile–DevOps projects.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Agile & DevOps** Agile Manifesto & principles Scrum framework: roles, events, artifacts Kanban method and Lean principles DevOps culture and "Three Ways" (Flow, Feedback, Learning)	03	10
2.	**Agile Planning & Project Management** User stories, acceptance criteria, estimation techniques Velocity, burn-down charts, backlog grooming Continuous planning & team ceremonies	03	12
3.	**Version Control & Collaboration** Git basics, branching strategies (GitFlow, trunk-based) Code review practices Collaboration tools (GitHub/GitLab, Jira, Trello)	04	13
4.	**Continuous Integration** Build automation & test automation pyramid CI servers and pipelines (GitHub Actions/GitLab CI/Jenkins) Static code analysis & quality gates	05	15
5. **Section II**			
6.	**Containerization & Environment Management** Docker fundamentals (images, containers, Compose) Introduction to Kubernetes: Pods, Deployments, Services Environment parity & reproducibility	05	15

7.	**Infrastructure as Code** Infrastructure provisioning (Terraform basics) Configuration management (Ansible basics) Secrets and config management	03	10
8.	**Continuous Delivery & Monitoring** Deployment strategies: Blue/Green, Canary, Rolling Observability: logs, metrics, tracing Monitoring tools (Prometheus, Grafana basics)	04	15
9.	**DevSecOps & Scaling Agile-DevOps** Security in CI/CD: SAST, DAST, dependency scanning Feature toggles, trunk-based development Scaling Agile (SAFe overview, value stream mapping) Measuring performance (DORA metrics)	03	10
	TOTAL	30	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to Agile tools – create Scrum board with backlog and sprint planning.	02
2.	Git & GitHub – branching, pull requests, merge conflicts.	02
3.	CI setup using GitHub Actions/Jenkins – build & test automation.	02
4.	Containerize a sample app with Docker & run with Docker Compose.	02
5.	Deploy microservice on Minikube with Kubernetes Deployments & Services.	04
6.	Provision simple VM/cluster using Terraform.	02
7.	Apply Ansible playbook for app configuration.	02
8.	Implement Blue/Green deployment with containers.	02
9.	Monitor service with Prometheus & visualize metrics in Grafana.	02
10.	Integrate security scanning in CI/CD pipeline.	02
11.	Implement feature toggles in a small project.	02
12.	Capstone mini-project: End-to-end Agile–DevOps pipeline for a sample web app.	06
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
The DevOps Handbook (2nd Edition)	Gene Kim, Jez Humble, Patrick Debois, John Willis, Nicole Forsgren,	IT Revolution (2021).

Reference Book(s):

Title	Author(s)	Publication
Accelerate: The Science of Lean Software and DevOps	Nicole Forsgren, Jez Humble, Gene Kim.	Wiley Publication.
The Phoenix Project	Gene Kim, Kevin Behr, George Spafford.	TMH Publication
Agile Estimating and Planning	Mike Cohn.	

Web Material Link(s):

- https://www.agilealliance.org

- https://www.devopsinstitute.com
- https://www.atlassian.com/agile
- https://docs.docker.com
- https://kubernetes.io/docs

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

SEIT4610	**DevOps and Agile Foundation**
CO 1	Explain Agile and DevOps principles and their role in modern software development.
CO 2	Apply Agile project management techniques (Scrum/Kanban) for team-based projects.
CO 3	Implement CI/CD pipelines using industry-standard tools.
CO 4	Containerize, deploy, and monitor applications in a DevOps environment.
CO 5	Integrate security and scaling practices into Agile–DevOps workflows.

Mapping of CO with PO

SEIT4610	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11
CO 1	2	2	1		2	1	1				2
CO 2	1	2	3	2	2			3	3	3	2
CO 3	2	3	3	3	3			2	2	2	2
CO 4	2	3	3	3	3	2		2		3	2
CO 5	2	3	3	3	3	3	2	2	2	3	3

Mapping of CO with PSO

SEIT4610	PSO1	PSO2	PSO3
CO 1	2	2	1
CO 2	2	3	2
CO 3	3	3	2
CO 4	3	3	3
CO 5	3	3	3

Level of Revised Bloom's Taxonomy in Assessment

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

Module No	Content	RBT Level
1.	Introduction to Agile & DevOps	1,2
2.	Agile Planning & PM	2,3,4
3.	Version Control	2,3,4
4.	Continuous Integration	2,3,4,6
5.	Containerization	2,3,4,5
6.	Infrastructure as Code	2,3,4,5
7.	Continuous Delivery & Monitoring	2,3,5,6
8.	DevSecOps & Scaling Agile-DevOps	3,4,5,6

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT4640
Course Name: Automata Theory & Language Processor
Prerequisite Course(s): -

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to
- understand basics of formal languages and automata.
- design grammars and automata for different formal languages.
- develop logic building to solve computational problems.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Review of Mathematical Preliminaries** Principle of Mathematical Induction, Proof by Contradiction, Introduction to Formal Languages and Automata, Alphabets, Strings and their properties, Languages, Determinism and Non-determinism	03	10
2.	**Finite Automata** Introduction to Transition systems, Description of Finite Automata, String acceptability by Finite Automata, Construction of NFA, NFA with ∈- moves, The Equivalence between DFA, NFA and ∈-NFA, Minimization of FA, Finite Automata with output- Moore and Mealy Models.	06	20
3.	**Regular Expression and Regular Language** Regular Expressions, Identities for RE, Construction of RE equivalent to FA using Arden's Theorem. Construction of FA equivalent to RE, Kleen's Theorem, Properties of Regular Languages and FA: Closure and Decision properties, Limitations of FA.	06	20
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Grammar:** Definition, Chomsky hierarchy, Context Free Grammar- Definition, Derivation, sentential form, parse tree, Ambiguous Grammar Removing ambiguity from grammar, Left Recursion, Left Factoring, Language generated by grammar, Construction of Grammar, Simplification of CFGs, Normal Forms for CFG: Chomsky Normal Form, Greibach Normal Form, Decision Properties of CFG	07	25

	Regular Grammar- Definition: Left Linear Grammar, Right Linear Grammar, The Conversion from: RG to FA and FA to RG, The Equivalence between LLG and RLG.		
5.	**Push Down Automata** Definition, Description of PDA, Acceptance by PDA, Operations on PDA, Construction of PDA, Equivalence between CFG and PDA, Deterministic PDA and Non-Deterministic PDA.	04	12
6.	**Turing Machine** Definition, Description of TM, Representation of TM, Language Acceptability by TMs, Construction of TM, Variants of TM: Multitape Turing Machines and NTM, Universal TM, The Model of LBA and Relationship between LBA and CSL, RS and RES, Closure properties of RS and RES.	04	13
	TOTAL	30	100

List of Practical:

Sr No	Name of Practical	Hours
1.	Problems based on proofs	02
2.	Problems based on identify the class language	02
3.	Problems based on DFA	02
4.	Problems based on minimal state automata	02
5.	Problems based on finite automata	02
6.	Problems based on Moore and Mealy machine	02
7.	Problems based on regular expressions and regular sets	02
8.	Problems based on pumping lemma	02
9.	Problems based on closure property	02
10.	Problems based on CNF and GNF	02
11.	Problems based on context-free grammar and language	02
12.	Problems based on PDA	02
13.	Problems based on TM	02
14.	Problems based on decidability	02
15.	Problems based on string/language validity	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Theory of Computer Science: Automata, Languages and Computation	By K.L.P. Mishra and N. Chandrasekaran	3rd Edition, PHI Learning Private Ltd.

Reference Book(s):

Title	Author/s	Publication
Introduction to Automata theory, languages and Computation	By John E. Hopcroft, Rajiv Motwani and Jeffery D. Ullman	3rd Edition, Pearson
Introduction to Languages and the Theory of Computation	By John C. Martin	4th Edition, McGraw Hill

Web Material Link(s):

• https://nptel.ac.in/courses/106104028/

• https://www.eecs.wsu.edu/~ananth/CptS317/Lectures/

Course Evaluation:
Theory:

- Continuous Evaluation consists of two test 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 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 and external viva consists of 30 marks during End Semester Exam.

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

SEIT4640	Automata Theory & Language Processor
CO 1	Explain the fundamental concepts of finite automata theory and formal languages.
CO 2	Apply formal mathematical methods to demonstrate and prove properties of languages, grammars, and automata.
CO 3	Analyze computational problems using grammar and automata-based theoretical concepts.
CO 4	Evaluate various models of computation to assess their expressive power and limitations.
CO 5	Develop engineering solutions and design applications by integrating concepts of automata theory, languages, and computation.

Mapping of CO with PO

SEIT4640	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3						1				2
CO 2		3	2						2			3
CO 3	2	2	3		2			2		1		3
CO 4			3	2						3		3
CO 5	2		3	3								3

Mapping of CO with PSO

SEIT4640	PSO1	PSO2	PSO3
CO 1	3		2
CO 2	3	3	2
CO 3	3	3	2
CO 4	3	3	3
CO 5		2	3

Level of Revised Bloom's Taxonomy in Assessment:

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

Module No	Content	RBT Level
1	Review of Mathematical Preliminaries	1, 2, 3, 4
2	Finite Automata	1, 2, 3, 5, 6
3	Regular Expression and Regular Language	1, 2, 3, 5, 6
4	Grammar	1, 2, 3, 5, 6
5	Push Down Automata	1, 2, 3, 4, 5,6
6	Turing Machine	1, 2, 3, 4, 5,6

P P Savani University
School of Engineering
Department of Information Technology

Course Code: SEIT4680
Course Name: Information Security Analysis & Audit
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	
2	2	0	3	40	60	40	60	0	0	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

- To Understand fundamental information security principles and risk management practices.
- To Learn methods and tools used for information security analysis.
- To Develop competence in conducting security audits to industry standards.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Information Security & Audit Fundamentals** Definition and importance of information security, Security principles: CIA triad, AAA framework, Security governance, policies, standards & procedures, Overview of Information Security Audit: purpose, scope, methodologies, Types of audits: internal, external, compliance, operational, forensic	04	13
2.	**Information Security Threats & Vulnerabilities** Threat categories: human, environmental, technical, Vulnerability types: software, network, configuration, physical, Malware types and attack vectors, Exploit lifecycle & threat intelligence sources	03	12
3.	**Risk Management & Assessment Techniques** Risk management concepts (ISO 31000, NIST RMF), Risk assessment steps: identification, analysis, evaluation, treatment, Qualitative vs quantitative methods, Business Impact Analysis (BIA), Risk registers and reporting	04	15
4.	**Security Controls & Frameworks** Types of controls: administrative, technical, physical Defense-in-depth strategy, Security frameworks overview: ISO 27001/27002, NIST CSF, COBIT, PCI DSS, Control assessment and maturity models	03	13
5.	**Security Audit Planning & Methodology** Audit lifecycle & planning stages, Defining objectives, scope, and criteria, Evidence gathering & evaluation, Documentation and audit work papers, Sampling techniques	04	10
6.	**Tools & Techniques for Security Analysis** Vulnerability assessment vs penetration testing, Network scanning tools: Nmap, Nessus, OpenVAS, Web security testing basics: Burp	04	10

	Suite, OWASP ZAP, Log analysis & SIEM overview (e.g., Splunk, ELK), Example walkthrough of basic vulnerability scanning		
7.	**Audit Reporting & Communication (4 Hours)** Structure of audit reports, Risk rating and prioritization, Findings, recommendations & remediation planning, Executive summaries and technical report writing best practices, Audit closure and follow-up	04	15
8.	**Legal, Ethical & Compliance Considerations** IT governance & regulatory compliance, Cybersecurity laws and standards (GDPR, HIPAA, SOX, IT Act, etc.), Ethical hacking vs unauthorized access, Professional ethics and auditor responsibility, Case studies & recent security breaches analysis	04	12
	TOTAL	**30**	**100**

List of Practical:

Sr. No	Name of Practical	Hours
1.	Create an organizational security policy including scope, objectives, roles, incident reporting procedure.	02
2.	Perform threat modeling and prepare a risk register based on identified security weaknesses.	02
3.	Use qualitative or quantitative techniques to calculate risk rating and prepare a heat map.	02
4.	Prepare a comparison report of ISO 27001, NIST CSF, and COBIT controls.	02
5.	Create an audit plan including audit objectives, scope, resources, checklist & timeline.	02
6.	Discover hosts, open ports, services & OS detection and document findings.	02
7.	Perform vulnerability scanning of a network or system and generate a vulnerability report.	02
8.	Identify and analyze common web vulnerabilities.	04
9.	Analyze system logs and generate alerts using Splunk / ELK / any SIEM simulator.	04
10.	Create checklist for physical, network, and application security controls.	02
11.	Create checklist for physical, network, and application security controls.	02
12.	Document identified weaknesses, observation notes, risk rating and corrective actions.	04
	TOTAL	**30**

Text Book(s):

Title	Author/s	Publication
Information Security: Principles and Practice	Mark Stamp	Wiley
Information Systems Auditing: Controls and Assurance	James A. Hall	Cengage

Reference Book(s):

Title	Author/s	Publication
Auditing IT Infrastructures for Compliance	Robert Johnson, Mike Duncan	Jones & Bartlett Learning
IT Auditing and Assurance	Neil J. Gunther & S. Subramani	Pearson

Web Material Link(s)

- https://www.coursera.org/learn/ccsp1

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 consists of 60 marks.

Practical/Tutorial:

- Continuous Evaluation consists of performance of Practical/Tutorial 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/drawing/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 student will be able to

SEIT4680	**Information Security Analysis and Audit**
CO1	*Explain* the fundamental concepts of information security, threats, vulnerabilities, and audit principles.
CO2	*Identify and analyze* security risks and assess their impact using appropriate risk assessment methodologies and tools.
CO3	*Apply* security frameworks, standards, and controls (ISO 27001, NIST, COBIT) for evaluating organizational security posture.
CO4	*Perform* security auditing tasks including audit planning, evidence collection, vulnerability assessment, and security analysis using tools like Nmap, Nessus, and SIEM.
CO5	*Prepare and present* professional security audit reports with findings, recommendations, corrective actions, and compliance considerations.

Mapping of CO with PO

SEIT4680	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO 1	3	2				2		1		1		1
CO 2	2	3	2	2	2							1
CO 3	2	2	3	1	2	1	1	1				
CO 4	1	2	2	3	3				2	1	1	1
CO 5		1	1	1	2	1	1	2	2	3	1	1

Mapping of CO with PSO

SEIT4680	**PSO 1**	**PSO 2**	**PSO 3**
CO1	1	2	1
CO2	2	3	1
CO3	2	3	1
CO4	3	2	2
CO5	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.	Introduction to Information Security & Audit Fundamentals	1, 2
2.	Information Security Threats & Vulnerabilities	1, 2, 4
3.	Risk Management & Assessment Techniques	2, 3, 4
4.	Security Controls & Frameworks	2, 3, 4
5.	Security Audit Planning & Methodology	3, 4, 5
6.	Tools & Techniques for Security Analysis	3, 4, 5
7.	Audit Reporting & Communication	4, 5, 6
8.	Legal, Ethical & Compliance Considerations	2, 4, 5

P P Savani University
School of Engineering
Department of Information Technology Engineering

Course Code: SEIT4660
Course Name: Artificial Intelligence
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	
2	2	0	3	40	60	40	60	0	0	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

- provide a fundamental understanding of the concepts, history, and scope of Artificial Intelligence.
- enable students to explore the role of AI in shaping future technologies and understand how machines can be designed to exhibit intelligent behaviour.
- develop the ability to design and implement AI-based solutions using appropriate techniques, tools, and algorithms.

Course Content:

Module No.	Content	Hours	Weightage in %
	SECTION-I		
1.	**What is AI?** What is an AI Technique? The AI Problems and applications, Major areas of Artificial Intelligence, Turing Test	03	11
2.	**Problems, State Space Search & Heuristic Search Techniques** Defining the Problems as a State Space Search, Production Systems: control & search strategies, Depth first and Breadth first search, Hill Climbing, Best first search, A* algorithm	06	22
3.	**Knowledge Representation Issues** Representations and Mappings, Approaches to Knowledge Representation, Using Propositional logic and Predicate Logic, Resolution, Semantic network, Frame based knowledge	05	15
	SECTION-II		
4.	**Representing Knowledge Using Rules** Procedural Versus Declarative Knowledge, Forward Reasoning, Backward Reasoning. Symbolic Reasoning, Under Uncertainty: Introduction to Non-monotonic Reasoning, Logics for Non-monotonic Reasoning	05	15
5.	**Uncertain Reasoning and alternatives** Probability and Bayes' Theorem, Certainty Factors and Rule-Base Systems, Bayesian Networks, Dempster Shafer Theory, Fuzzy sets, Fuzzy Logic, Fuzzy systems, Hidden Markov model	06	22
6.	**Game Theory**	05	15

	Introduction to Game playing, The Minimax search procedure, Alpha-Beta procedure, Refinements, Iterative Deepening		
	TOTAL	**45**	**100**

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Overview of Artificial Intelligence systems.	02
2.	Write a program to implement BFS (for 8 puzzle problem or Water Jug problem or any AI search problem)	04
3.	Write a program to implement DFS (for 8 puzzle problem or Water Jug problem or any AI search problem)	04
4.	Write a program to Implement A* Algorithm.	04
5.	Explore different python packages which are applicable in AI.	04
6.	Write a program to construct a Bayesian network from given data.	04
7.	Write a program to infer from the Bayesian network.	04
8.	Hidden Markov model implementation using python.	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Artificial Intelligence	By Elaine Rich And Kevin Knight	(2nd Edition) Tata McGraw-Hill

Reference Book(s):

Title	Author/s	Publication
Artificial Intelligence: A Modern Approach	Stuart Russel, Peter Norvig, PHI	

Web Material Link(s)

- https://nptel.ac.in/courses/106106126/
- https://www.edureka.co/post-graduate/machine-learning-and-ai?utm_source=google&utm_medium=cpc&utm_campaign=ET-PGPINML-05-Search-AI-High-Intent-Minus-18-24&gclid=EAIaIQobChMI55v6_uC55wIVjx0rCh001wW5EAAYAyAAEgJcyfD_BwE

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 consists of 60 marks.

Practical/Tutorial:

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- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/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

SEIT4660	ARTIFICIAL INTELLIGENCE
CO 1	Identify ai limitations, strengths and human centered problems.
CO 2	Employ basic ai principles learning and representation of knowledge.
CO 3	Recognize the importance of ai techniques to design efficient systems.
CO 4	Develop real world solutions based on artificial intelligence.

Mapping of CO with PO

SEIT4660	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11	PO12
CO 1	3	3			2			1				2
CO 2		3			2				3			3
CO 3			3	2	3			2	2			3
CO 4	2		3	3	3		1			3		3

Mapping of CO with PSO

SEIT4660	PSO1	PSO2	PSO3
CO 1	3	2	
CO 2		3	2
CO 3	2	3	
CO 4	3	3	2

Level of Revised Bloom's Taxonomy in Assessment:

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

Module No	Content	RBT Level
1	What is AI?	1, 2, 4
2	Problems, State Space Search & Heuristic Search Techniques	1, 2, 3, 5
3	Knowledge Representation Issues	2, 3, 4, 5
4	Representing Knowledge Using Rules	2, 3, 4
5	Uncertain Reasoning and alternatives	2, 3, 4, 6
6	Game Theory	2, 3, 5

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