

Syllabus Book

3rd Year B.Sc. Information Technology



P P Savani University

School of Sciences
Department of B.Sc. IT

Effective From: 2020-21
Authored by: P P Savani University

P P SAVANI UNIVERSITY

SCHOOL OF SCIENCES

TEACHING & EXAMINATION SCHEME FOR THIRD YEAR B. SC. (INFORMATION TECHNOLOGY) PROGRAMME

Sem	Course Code	Course Name	Offered by	Teaching Scheme				Examination Scheme								
				Contact Hours				Credit	Theory		Practical		Tutorial		Total	
				Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE		
5	SSIT3910	Summer Training/Project	IT	04				00	04	00	00	100	00	00	00	100
	SSIT3010	Software Engineering	IT	03	00	01	04	04	40	60	00	00	50	00	150	
	SSIT3021	Data Science	IT	03	04	00	07	05	40	60	40	60	00	00	200	
	SSIT3030	Open Source Technology	IT	00	04	00	04	02	00	00	100	00	00	00	100	
	SSIT3920	Minor Project - III	IT	06				06	06	00	00	100	100	00	00	200
	SEPD3020	Corporate Grooming & Etiquette	SEPD	01	02	00	03	02	00	00	50	50	00	00	100	
		Elective - II	IT	02	02	00	04	03	40	60	20	30	00	00	150	
				Total				28	26							1000
6		Elective III	IT	02	02	00	04	03	40	60	20	30	00	00	150	
	SSIT3930	Major Project	IT	03	20			20	20	00	00	500	500	00	00	1000
				Total				29	22							1150

P P SAVANI UNIVERSITY**SCHOOL OF SCIENCES****TEACHING & EXAMINATION SCHEME FOR THIRD YEAR B. SC. (INFORMATION TECHNOLOGY) PROGRAMME
(ELECTIVE COURSES)**

Course Code	Course Name	Offered By	Teaching Scheme					Examination Scheme						
			Contact Hours				Credit	Theory		Practical		Tutorial		Total
			Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
SSIT3510	Cyber Security	CE	02	02	00	04	03	40	60	20	30	00	00	150
SSIT3520	Computers & Network Security	CE	02	02	00	04	03	40	60	20	30	00	00	150
SSIT3530	Wireless Networks	CE	02	02	00	04	03	40	60	20	30	00	00	150
SSIT3540	Artificial Intelligence	CE	02	02	00	04	03	40	60	20	30	00	00	150
SSIT3550	Programming with .NET	CE	02	02	00	04	03	40	60	20	30	00	00	150
SSIT3560	System Programming	IT	02	02	00	04	03	40	60	20	30	00	00	150

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Electives

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5	SSIT3550	Programming With .Net	32-34
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Course Code: SSIT3910

Course Name: Summer Training/Project

Prerequisite Course(s): --

Teaching & Examination Scheme

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- identify, analyze and articulate projects with a comprehensive and systematic approach.
- develop creative thinking.
- develop Ability to solve problem
- learn working in a team.

Guidelines(s):

Sr. No.	Content	Hours	Weightage in %
1.	Selection of Project Title After selecting the Project and proposed title, get approval from the Expert Panel	10	10
2.	Literature Review / Requirement Analysis Study in detail about the project definition chosen	10	10
3.	System Design Prepare the required documents in consultation with Mentor Introduction, Purpose, System Overview, System Design Constraints, Roles and Responsibilities, System Architecture, Database Design, System Security Controls, Project Reference	10	20
4.	Implementation Implementation of the project in any of the programming languages	20	40
5.	Report Writing The report must be prepared as per suggested guidelines consisting of Preamble, Objectives, Scope, Introduction, Conclusions, Recommendations and Annexure	05	10
6.	Presentation Preparation At the end of the semester, the student/group of students shall give a presentation of their work followed by a viva-voce examination	05	10

Course Evaluation:

Sr. No	Evaluation Criteria	Marks
1.	Selection of the topic (Within first 30 Days of commencement of semester)	10
2.	Initial Presentation of the topic (Within 31 to 45 Days of commencement of semester)	10
3.	An actual work carried out. (Within 46 to 70 Days of commencement of semester)	40
4.	Report writing as per guidelines.	10
5.	Presentation & Question-Answer session.	30

Course Outcome(s):

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

- get information about various existing and future technologies.
- learn the technology of choice and apply that knowledge in solving real life problems.
- develop skills to work in the industry.

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Course Code: SSIT3010

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	00	01	04	40	60	00	00	50	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

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

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	Introduction to Software Engineering Study of Different Models, Software Characteristics Components, Applications, Layered Technologies, Processes, Methods and Tools, Generic View of Software Engineering, Process Models- Waterfall model, Incremental, Evolutionary process models- Prototype, Spiral, and Concurrent Development Model	07	15
2.	Requirements Engineering Problem Recognition, Requirement Engineering tasks, Processes, Requirements Specification, Use cases, and Functional specification, Requirements validation, Requirements Analysis, Modeling – different types	06	15
3.	Structured System Design Design Concepts, Design Model, Software Architecture, Data Design, Architectural Styles and Patterns, Architectural	05	05

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

List of Tutorial:

Sr. No.	Name of Tutorial	Hours
1.	To identify the role of the software in today's world across a few significant domains related to day to day life.	01
2.	To identify the problem related to software crisis for a given scenario.	01
3.	To identify the suitable software development model for the given scenario.	01

4.	To identify the various requirement development activities viz. elicitation, analysis, specification and verification for the given scenarios.	01
5.	To identify the various elicitation techniques and their usage for the Banking case study.	01
6.	To classify the requirement into functional and non-functional requirements.	01
7.	Identify the elements in software Requirements Specification document.	01
8.	To verify the requirements against the quality attributes.	01
9.	Identify the elements and relationship by analyzing the class diagram of Shop Retail Application case study.	01
10.	Identify the design principle that is being violated in relation to the given scenario.	01
11.	To identify the usage of stubs or drivers in the context of an integration testing scenario.	01
12.	Identify the different types of performance testing.	01
13.	To identify the usage of regression testing.	01
14.	To understand usage of software metrics.	01
15.	Project Work: Understand importance of SDLC approach & various processes.	01

Text Book(s):

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

Reference Book(s):

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

Web Material Link(s):

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

Course Evaluation:

Theory:

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

Practical:

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

- Practical performance/quiz/test consists of 15 marks during End Semester Exam.
- Viva/oral performance consists of 15 marks during End Semester Exam.

Course Outcome(s):

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

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

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Course Code: SSIT3021

Course Name: Data Science

Prerequisite Course(s): SSIT1040 - Data 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	04	00	05	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- study fundamentals of data analytics and data science pipeline.
- apply statistical methods, regression techniques, and machine learning algorithms to make sense out of both large and small data sets.
- understand various Data Visualization techniques and their applications.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	An Introduction to core concepts & technologies Introduction, Terminology, data science process, data science toolkit, Types of data, Examples and applications	06	10
2.	Data collection and management Introduction, Sources of data, Data collection and APIs, Exploring and fixing data, Data storage and management, Using multiple data sources	07	15
3.	Data analysis Introduction, Terminology and concepts, Introduction to statistics, Central tendencies and distributions, Variance, Distribution properties and arithmetic, Samples/CLT, Basic machine learning algorithms, Linear regression, SVM, Naive Bayes	09	25
Section II			
Module No.	Content	Hours	Weightage in %
1.	Data visualization Introduction, Types of data visualization, Data for visualization: Data types, Data encodings, Retinal variables, Mapping variables to encodings, Visual encodings	09	25

2.	Applications of Data Science, Technologies for visualization, Bokeh (Python)	07	15
3.	Recent trends in various data collection and analysis techniques, various visualization techniques, application development methods used in data science	07	10

List of Practical:

Sr. No	Name of Practical	Hours
1.	Basics of Python for Data Analysis <ul style="list-style-type: none"> Why learn Python for data analysis? Python 2.7 v/s 3.4 How to install Python? Running a few simple programs in Python 	06
2.	Python libraries and data structures <ul style="list-style-type: none"> Python Data Structures Python Iteration and Conditional Constructs Python Libraries 	08
3.	Exploratory analysis in Python using Pandas <ul style="list-style-type: none"> Introduction to series and data frames Analytics of dataset- Loan Prediction Problem 	08
4.	Data Munging in Python using Pandas	06
5.	Building a Predictive Model in Python <ul style="list-style-type: none"> Logistic Regression Decision Tree Random Forest 	12
6.	Mini Project	20

Text Book(s):

Title	Author/s	Publication
Data Mining: Concepts and Techniques	Jiawei Han, Micheline Kamber and Jian Pei	Morgan Kaufmann
Doing Data Science: Straight Talk from the Frontline	Cathy O'Neil and Rachel Schutt	O'REILLY
Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data	EMC Education Services	Wiley

Reference Book(s):

Title	Author/s	Publication
Introduction to Data Science: Big data, machine learning, and more using Python tools	Arno D. B. Meysman Davy Cielen and Mohamed Ali	Manning Publications
The Data Science Handbook	Field Cady	Wiley
Data Science	John D. Kelleher and Brendan Tierney	MIT Press
Practical Data Science with R	Nina Zumel and John Mount	Manning Publication

Web Material Link(s):

- <https://www.edureka.co/blog/what-is-data-science/>
- <https://www.analyticsvidhya.com/blog/2016/01/complete-tutorial-learn-data-science-python-scratch-2/>
- <https://www.ngdata.com/top-tools-for-data-scientists/>
- <https://towardsdatascience.com/intro-to-data-science-part-2-data-wrangling-75835b9129b4>
- <https://www.allerin.com/blog/top-5-sources-of-big-data>
- https://www.tutorialspoint.com/excel_data_analysis/data_analysis_overview.htm
- https://www.tutorialspoint.com/statistics/data_collection.htm
- <https://docs.bokeh.org/en/latest/>

Course Evaluation:**Theory:**

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

Practical:

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

Course Outcome(s):

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

- understand the key concepts in data science, including their real-world applications and the toolkit used by data scientists;
- understand how data is collected, managed and stored for data science;
- implement data collection and management scripts using MongoDB.

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Course Code: SSIT3030

Course Name: Open Source 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	
04			02	00	00	100	00	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- understand basics of Selenium.
- develop Web UI (User Interface) automation testing suit.
- develop and design testing-based tools.

Course Content:

Sr. No.	Content	Weightage In %
1.	Selenium IDE installation	25
2.	Selenium IDE features, first test case, login test, commands, creating test cases and locating strategies	25
3.	Selenium web driver and its architecture	25
4.	Selenium web driver first test case and installation, features.	25

List of Practical/Tutorial:

Sr No	Name of Practical/Tutorial	Hours
1.	Running test case on Firefox	04
2.	Running test case on chrome	04
3.	Running test case on IE and running test case on safari	04
4.	Locating strategies by ID, class name, name, tag name, tag name, link text, partial link text, CSS and XPath	04
5.	WEB driver commands: handling radio buttons, assertions, checkbox, and grid.	04
6.	Selenium with python: <ul style="list-style-type: none"> • Login to Facebook • Login to Facebook and check title • How to increase view count on website? • How to login on website take example of zomato? • Automate google search using selenium with python 	10

Web Material Link(s):

- <https://www.javatpoint.com/selenium-python>
- <https://www.techbeamers.com/selenium-webdriver-python-tutorial/>

Course Evaluation:**Practical:**

- Continuous Evaluation consists of Performance of Practical which should be evaluated out of 50 for each practical and average of the same will be converted to 50 Marks.
- Internal Viva consists of 50 Marks.

Course Outcome(s):

At the end of the course, the students will be able to

- learn the fundamentals of distributed environment.
- develop efficient distributed system with their own logic & capabilities.
- understand the security aspects in distributed environment.

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Course Code: SSIT3920

Course Name: Minor Project - III

Prerequisite Course(s): --

Teaching & Examination Scheme

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
06			06	00	00	100	100	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- identify, analyze and articulate projects with a comprehensive and systematic approach.
- develop creative thinking.
- perform in a team.

Guidelines(s):

Section I			
Sr. No.	Content	Hours	Weightage in %
1.	Selection of Title Select a topic of interest to work upon which can be from any domain. After selecting the topic and proposed title, get approval from the concerned faculty	06	10
2.	Literature Review Study in detail about the topic chosen	12	10
3.	Project Proposal Prepare the proposal on the aspect of the selected area to work upon	10	40
4.	Implementation Implementation of the proposal in any of the programming languages	08	20
5.	Report Writing The report must be prepared as per suggested guidelines consisting of Preamble, Objectives, Scope, Introduction, Conclusions, Recommendations and Annexure	04	10
6.	Presentation & Question-Answer At the end of the semester, the student/group of students shall give a presentation of their work followed by a viva-voce examination	05	10

Course Evaluation:

Sr. No	Name of Practical	Hours
1.	Selection of the topic (Within first 20 Days of commencement of semester)	10
2.	Initial Presentation of the topic	10
3.	An actual work carried out	10
4.	Report writing as per guidelines	10
5.	Project and report submission	10
6.	Presentation & Question-Answer session	50

Course Outcome(s):

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

- get information about various existing and future technologies.
- learn the technology of choice and apply that knowledge in solving real life problems.
- develop skills to work in a team.

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Centre for Skill Enhancement & Professional Development

Course Code: SEPD3020

Course Name: Corporate Grooming & Etiquette

Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

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

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	Corporate Grooming <ul style="list-style-type: none"> • Introduction to corporate culture • Corporate Expectations • Need of Self-Grooming to the Corporate Expectations • Understanding and importance of Professionalism 	03	25
2.	Personal Skills <ul style="list-style-type: none"> • Behavioral skills • Language Skills • Knowledge Skills • Problem Solving Skills • Developing professional attitude 	04	25
Section II			
1.	Management Skills <ul style="list-style-type: none"> • Self-management • Time management • Work life balance 	04	25

2.	Organizational Etiquettes <ul style="list-style-type: none"> • General Workplace Etiquettes • Presentation Etiquettes • Meeting Etiquettes 	04	25
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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
Behavioural Science: Achieving Behavioural 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

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

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Course Code: SSIT3930

Course Name: Major Project

Prerequisite Course(s): --

Teaching & Examination Scheme

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
					ESE	CE	ESE	CE	ESE	
03	20		20	00	00	500	500	00	00	1000

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- identify, analyze and articulate projects with a comprehensive and systematic approach.
- develop creative thinking.
- develop Ability to solve problem
- learn working in a team.

Guidelines(s):

Section I			
Sr. No.	Content	Hours	Weightage in %
1.	Selection of Project Title After selecting the Project and proposed title, get approval from the Expert Panel	30	10
2.	Literature Review / Requirement Analysis Study in detail about the project definition chosen	30	10
3.	System Design Prepare the required documents in consultation with Mentor, Introduction, Purpose, System Overview, System Design Constraints, Roles and Responsibilities, System Architecture, Database Design, System Security Controls, Project Reference	40	20
4.	Implementation Implementation of the project in any of the programming languages	100	40
5.	Report Writing The report must be prepared as per suggested guidelines consisting of Preamble, Objectives, Scope, Introduction, Conclusions, Recommendations and Annexure	50	10
6.	Presentation Preparation At the end of the semester, the student/group of students shall give a presentation of their work followed by a viva-voce examination.	50	10

Course Evaluation:

Sr. No	Evaluation Criteria	Marks
1.	Selection of the topic (Within first 30 Days of commencement of semester)	100
2.	Initial Presentation of the topic (Within 31 to 45 Days of commencement of semester)	100
3.	An actual work carried out. (Within 46 to 70 Days of commencement of semester)	400
4.	Report writing as per guidelines	100
5.	Presentation & Question-Answer session	300

Course Outcome(s):

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

- get information about various existing and future technologies.
- learn the technology of choice and apply that knowledge in solving real life problems.
- develop skills to work in the industry.

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Course Code: SSIT3510

Course Name: Cyber Security

Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

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

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	Introduction to Cyber Security Overview of Cyber Security, Internet Governance – Challenges and Constraints, Cyber Threats: - Cyber Warfare-Cyber Crime-Cyber Terrorism-Cyber Espionage, need for a Comprehensive Cyber Security Policy, need for a Nodal Authority, Need for an International convention on Cyberspace	05	10
2.	Cyber Security Vulnerabilities and Cyber Security Safeguards Cyber Security Vulnerabilities-Overview, vulnerabilities in software, System administration, Complex Network Architectures, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness. Cyber Security Safeguards-Overview, Access control, Audit, Authentication, Biometrics, Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection Systems, Response, Scanning, Security policy, Threat Management	05	20
3.	Securing Web Application, Services and Servers Introduction, Basic security for HTTP Applications and Services, Basic Security for SOAP Services, Identity Management and Web Services, Authorization Patterns, Security Considerations, Challenges	02	10

4.	Intrusion Detection and Prevention Intrusion, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection, Intrusion detection and Prevention Techniques, Anti-Malware software, Network based Intrusion detection Systems, Network based Intrusion Prevention Systems, Host based Intrusion prevention Systems, Security Information Management, Network Session Analysis, System Integrity Validation	03	10
Section II			
Module No.	Content	Hours	Weightage In %
1.	Cryptography and Network Security Introduction to Cryptography, Symmetric key Cryptography, Asymmetric key Cryptography, Message Authentication, Digital Signatures, Applications of Cryptography. Overview of Firewalls- Types of Firewalls, User Management, VPN Security Security Protocols: - security at the Application Layer- PGP and S/MIME, Security at Transport Layer- SSL and TLS, Security at Network Layer-IPSec	05	20
2.	Cyberspace and the Law Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2013	05	20
3.	Cyber Forensics Introduction to Cyber Forensics, Handling Preliminary analysis, Investigating Investigations, Controlling an Investigation, conducting disk-based Information-hiding, Scrutinizing E-mail, Validating E-mail header information, Tracing Internet access, Tracing memory in real-time	05	10

List of Practical:

Sr No	Name of Practical	Hours
1.	TCP scanning using NMAP	2
2.	Port scanning using NMAP	2
3.	TCP / UDP connectivity using Netcat	2
4.	Network vulnerability using OpenVAS	4
5.	Web application testing using DVWA	2
6.	Manual SQL injection using DVWA	4
7.	XSS using DVWA	4
8.	Automated SQL injection with SqlMap	4
9.	Design based Problems (DP)/Open Ended Problem:	6

Text Book(s):

Title	Author/s	Publication
Cybersecurity for Beginners	RaefMeeuwisse	Cyber Simplicity Ltd

Reference Book(s):

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

Web Material Link(s):

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

Course Evaluation:**Theory:**

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

Practical:

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

Course Outcome(s):

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

- understand cyber-attack, types of cybercrimes, cyber laws and also how to protect them self and ultimately society from such attacks.
- apply Information Security Standards compliance during software design and development.

P P Savani University
School of Sciences

Course Code: SSIT3520

Course Name: Computers & Network Security

Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

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

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	Introduction Symmetric Cipher Model, Cryptography and Cryptanalysis, Types of Security, Security Services, Security Attacks and Security Mechanisms, Substitution and Transposition techniques.	01	05
2.	Classical Encryption Techniques Substitution Ciphers, Permutation/Transposition Ciphers, PlayFair and Hill Ciphers, Polyalphabetic Ciphers, OTP and Machine Ciphers.	02	05
3.	Mathematics of Cryptography 1 Integer arithmetic, modular arithmetic.	02	05
4.	Stream Ciphers and Block Ciphers Stream ciphers and block ciphers, Block Cipher structure, Data Encryption standard (DES) with example, strength of DES, Design principles of block cipher, AES with structure, its transformation functions, key expansion, example and implementation.	02	10
5.	Multiple Encryption and Triple DES Multiple encryption and triple DES, Electronic Code Book, Cipher Block Chaining Mode, Cipher Feedback mode, Output Feedback mode, Counter mode.	02	05

6.	Mathematics of Cryptography 2 Algebraic Structures, GF (2^n) fields.	02	05
7.	Public Key Cryptosystems Public Key Cryptosystems with Applications, Requirements and Cryptanalysis, RSA algorithm, its computational aspects and security, Diffie-Hillman Key Exchange algorithm, Man-in-Middle attack.	02	10
8.	Key Management and Distribution Key management and distribution, symmetric key distribution using symmetric and asymmetric encryptions, distribution of public keys, X.509 certificates, Public key infrastructure.	02	05
Section II			
Module No.	Content	Hours	Weightage in %
1.	Cryptographic Hash Functions Cryptographic Hash Functions, their applications, Simple hash functions, its requirements and security, Hash functions based on Cipher Block Chaining, Secure Hash Algorithm (SHA).	02	05
2.	Message Authentication Codes Message Authentication Codes, its requirements and security, MACs based on Hash Functions, Macs based on Block Ciphers.	02	05
3.	Digital Signature, its properties Digital Signature, its properties, requirements and security, various digital signature schemes (Elgamal and Schnorr), NIST digital Signature algorithm.	02	05
4.	Remote User Authentication with Symmetric and Asymmetric Encryption Remote user authentication with symmetric and asymmetric encryption, Kerberos.	02	05
5.	Network Security What is Network Security? Introduction to TCP/IP protocol stack, Security at various layers of TCP/IP, Types of Network Attacks: Active Attacks and Passive Attacks.	02	05
6.	Firewalls and Web Security Packet filters, Application level gateways, Encrypted tunnels, Cookies, Web security problems.	01	05
7.	Application Layer Security Electronic Mail Security: Distribution lists, Establishing keys, Privacy, source authentication, message integrity, non-repudiation, proof of submission, proof of delivery, message flow confidentiality, anonymity, Pretty Good Privacy (PGP).	01	05
8.	Security at Network Layer SSL and TLS. IPSec, AH, ESP, IKE.	01	10
10.	Advanced Topics Intruders, Virus, Trojans, Malware, Ransomware.	02	05

List of Practical:

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

Text Book(s):

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

Reference Book(s):

Title	Author/s	Publication
Cryptography and Network Security	Behrouz A. Forouzan	McGraw-Hill Education
Network Security: Private Communications in a Public World, 2 nd 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 the average of the same will be converted to 30 marks.
- Faculty Evaluation consists of 10 marks as per guidelines provided by Course Coordinator.
- End Semester Examination consists of 60 marks.

Practical:

- Continuous Evaluation consists of performance of practical which will be evaluated out of 10 for each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 15 marks during End Semester Exam.
- Viva/oral performance consists of 15 marks during End Semester Exam.

Course Outcome(s):

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

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

P P Savani University
School of Sciences

Course Code: SSIT3530

Course Name: Wireless Networks

Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

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

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	<p>Mobile Computing Architecture Types of Networks, Architecture for Mobile Computing, 3-tier Architecture, Design Considerations for Mobile Computing, Applications.</p> <p>Wireless Transmission Signals, Antennas Signal propagation, Multiplexing, Modulation, Cellular Systems.</p> <p>Medium Access Control Motivation for a specialized MAC, SDMA, FDMA, TDMA, CDMA.</p>	03	05
2.	<p>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.</p>	04	15

3.	Wireless Networks – 2 GPRS, GPRS and Packet Data Network, GPRS Network Architecture, GPRS Network Operations, Data Services in GPRS, Applications for GPRS, Billing and Charging in GPRS.	04	15
4.	Wireless Networks –3 3G,4G, and 5G Networks, WiMAX, Third Generation Networks, Fourth Generation Networks, Vision of 5G,3G vs. 4G vs. 5G, Features and Challenges, Introduction to WiMAX.	04	15
Section II			
Module No.	Content	Hours	Weightage in %
1.	Mobile network layer Mobile IP, Dynamic Host Configuration protocol, Mobile ad-hoc networks Mobile Transport layer Traditional TCP, classical TCP improvements, TCP over 3G/4G wireless networks	04	10
2.	Mobile OS and Computing Environment Smart Client Architecture, The Client: User Interface, Data Storage, Performance, Data Synchronization, Messaging. The Server: Data Synchronization, Enterprise Data Source, Messaging. Mobile Operating Systems, The Development Process,	04	15
3.	Building Mobile Internet Applications Thin client: Architecture, the client, Middleware, Messaging Servers, Processing a Wireless request, Wireless Applications Protocol (WAP) Overview, Wireless Languages: Markup Languages, HDML, WML, HTML, cHTML, XHTML, VoiceXML.	04	15
4.	The architecture of future Networks, Wireless Sensor Network, IoT	03	10

List of Practical:

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

Text Book(s):

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

Reference Book(s):

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

Web Material Link(s):

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

Course Evaluation:**Theory:**

- Continuous Evaluation consists of two tests each of 15 marks and 1 hour of duration and the average of the same will be converted to 30 marks.
- Faculty Evaluation consists of 10 marks as per guidelines provided by Course Coordinator.
- End Semester Examination consists 60 marks.

Practical:

- Continuous Evaluation consists of the performance of practical which will be evaluated out of 10 for each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 15 marks during End Semester Exam.
- Viva/oral performance consists of 15 marks during End Semester Exam.

Course Outcome(s):

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

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

P P Savani University
School of Sciences

Course Code: SSIT3540

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	
02	02	00	03	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- understand basics of AI
- develop roles in future and also introduce the intelligence of machine
- design AI

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	What is AI?: The AI Problems, The Underlying Assumption, What Is An AI Techniques, The Level Of The Model, Criteria For Success, Some General References, One Final Word.	05	10
2.	Problems, State Space Search & Heuristic Search Techniques: Defining the Problems as A State Space Search, Production Systems, Production Characteristics, Production System Characteristics, And Issues in The Design of Search Programs	05	10
3.	Knowledge Representation Issues: Representations and Mappings, Approaches to Knowledge Representation. Using Predicate Logic: Representation Simple Facts in Logic, Representing Instance and Isa Relationships, Computable Functions and Predicates, Resolution.	05	10
4.	Representing Knowledge Using Rules: Procedural Versus Declarative Knowledge, Logic Programming, Forward Versus Backward Reasoning. Symbolic Reasoning Under Uncertainty: Introduction to No monotonic Reasoning, Logics for Non-monotonic Reasoning	05	10
5.	Statistical Reasoning: Probability and Bays' Theorem, Certainty Factors and Rule-Base Systems, Bayesian Networks, Dempster Shafer Theory, Fuzzy Logic.	05	10

Section II			
Module No.	Content	Hours	Weightage in %
1.	Strong Slot-and-Filler Structures: Conceptual Dependency, Scripts, CYC Weak Slot-and-Filler Structures	05	5
2.	Understanding: What is understanding? What makes it hard? As constraint satisfaction and Game Playing: Overview, And Example Domain: Overview, Minimax, Alpha-Beta Cut-off, Refinements, Iterative deepening, The Blocks World,	05	10
3.	Natural Language Processing: Introduction, Syntactic Processing, Semantic Analysis, Semantic Analysis, Discourse and Pragmatic Processing, Spell Checking	05	10
4.	Connectionist Models: Introduction: Hopfield Network, Learning in Neural Network, Application of Neural Networks, Recurrent Networks, Distributed Representations, Connectionist AI and Symbolic AI.	03	10
5.	Introduction to Prolog: Introduction to Prolog: Syntax and Numeric Function, Basic List Manipulation Functions in Prolog, Functions, Predicates and Conditional, Input, Output and Local Variables, Iteration and Recursion, Property Lists and Arrays, Miscellaneous Topics, LISP and Other AI Programming Languages.	07	15

List of Practical:

Sr No	Name of Practical	Hours
1.	Write a program to implement Tic-Tac-Toe game problem	02
2.	Write a program to implement BFS (for 8 puzzle problem or Water Jug problem or any AI search problem)	02
3.	Write a program to implement DFS (for 8 puzzle problem or Water Jug problem or any AI search problem)	02
4.	Write a program to implement Single Player Game (Using Heuristic Function)	02
5.	Write a program to Implement A* Algorithm.	02
6.	Write a program to solve N-Queens problem using Prolog	04
7.	Write a program to solve 8 puzzle problem using Prolog.	06
8.	Write a program to solve travelling salesman problem using Prolog	04
9.	Convert following Prolog predicates into Semantic Net cat(tom). cat(cat1). mat(mat1). sat_on(cat1,mat1). bird(bird1). caught(tom,bird1). like(X,cream) :- cat(X). mammal(X) :- cat(X). has(X,fur) :- mammal(X).	04

	animal(X) :- mammal(X). animal(X) :- bird(X). owns(john,tom). is_coloured(tom,ginger).	
10.	Write the Conceptual Dependency for following statements. (a) John gives Mary a book (b) John gave Mary the book yesterday	02

Reference Book(s):

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

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=EAlaIQobChMI55v6_uC55wIVjx0rCh001wW5EAAYAAEgJcyfD_BwE

Course Evaluation:

Theory:

- Continuous Evaluation consists of Two Test Each of 30 Marks and 1 Hour of duration.
- Faculty Evaluation consists of 10 marks as per guidelines provided by Course Coordinator.
- End Semester Examination consists 60 Marks.

Practical:

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

Course Outcome(s):

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

- learn the fundamentals of distributed environment.
- develop efficient distributed system with their own logic & capabilities.
- understand the security aspects in distributed environment.

P P Savani University
School of Sciences

Course Code: SSIT3550

Course Name: Programming with .NET

Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- understand the .NET framework and its applications.
- Learn the basics of C#.
- ASP.NET web services and web service security.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	Introduction to .NET Framework .NET Overview, NET framework, course mechanics, CLR, Assemblies (monolithic vs. component-based applications), Execution Model, Client-Side vs. Server-Side Programming.	05	16
2.	Basics and Console Applications in C# Name Spaces, Constructors, Destructors, Function Overloading, Inheritance, Operator Overloading, Modifier Properties, Indexers, Attributes, Reflection API, Console Applications, Generating Console Output, Processing Console Input.	05	16
3.	C#.NET Language Features and Creating .NET Projects, Namespaces Classes and Inheritance, Namespaces Classes and Inheritance, C, Exploring the Base Class Library, Debugging and Error Handling, Data Types, Exploring Assemblies and Namespaces, String Manipulation, Files and I/O, Collections.	05	18
Section II			
Module No.	Content	Hours	Weightage in %
1.	Windows Forms and Controls in details The Windows Forms Model, Creating Windows Forms Windows Forms Properties and Events, Windows Form	04	14

	Controls, Menus, Dialogs, Tool Tips, Printing - Handling Multiple Events, GDI+, Creating Windows Forms Controls.		
2.	ASP.NET Introduction to ASP.NET, Working with Web and HTML Controls, Using Rich Server Controls, Login controls, Overview of ASP.NET Validation Controls, Using the Simple Validations, Using the Complex Validators Accessing Data using ADO.NET, Using the Complex Validators Accessing Data using ADO.NET, Configuration Overview, ASP.NET state management, tracing, caching, error handling, security, deployment.	04	12
3.	Managing State Preserving State in Web Applications and Page-Level State, Using Cookies to Preserve State, ASP.NET Session State, Storing Objects in Session State, Configuring Session State, Setting Up an Out-of-Process State Server, Storing Session State in SQL Server, Using Cookieless Session IDs, Application State Using the DataList and Repeater Controls, Overview of List-Bound Controls, Creating a Repeater Control and DataList Control.	07	24

List of Practical:

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

Text Book(s):

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

Reference Book(s):

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

Web Material Link(s):

- <https://teamtreehouse.com/learn/csharp>
- <https://www.asp.net/aspnet/videos>
- <https://www.asp.net/web-forms/videos/aspnet-35>

Course Evaluation:**Theory:**

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

Practical:

- Continuous Evaluation consists of the performance of practical which will be evaluated out of 10 for each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 15 marks during End Semester Exam.
- Viva/oral performance consists of 15 marks during End Semester Exam.

Course Outcome(s):

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

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

P P Savani University
School of Sciences

Course Code: SSIT3560

Course Name: System Programming

Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help students to

- study the architecture of a hypothetical machine, its assembly language, macro language.
- understand the structure and design of assemblers, linkers and loaders.
- understand the concepts and theory behind the implementation of high-level programming languages.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	Introduction Hierarchy of computer language, Physical address space and Logical address space, Life Cycle of a source program, Types of Language Processors, Data Structure for Language Processing	03	10
2.	Assemblers Elements of Assembly Language Programming, Types of Assembly Statements, Types of Assemblers, Advanced Assembler Directives, Data Structure in One-pass assembler and Two-pass assembler, Intermediate code for imperative statements and its type, Error reporting in assembler	06	20
3.	Macro and Macro Processors Introduction, Macro Definition and Call, Macro Expansion, Nested Macro Calls, Advanced Macro Facilities, Design of a Macro Pre-processor, Design of a Macro Assembler, Design Issues of Macro Processors, Two-Pass Macro Processors, One-Pass Macro Processors	06	20

Section II			
Module No.	Content	Hours	Weightage in %
1.	Linkers and Loaders Relocation and Linking Concepts, Program Relocation, Design of Linkers, Scheme for Relocation, Scheme for Linking, Self-Relocating programs, Linking of Overlay Structure Programs, Absolute Loader, Relocating Loader	06	20
2.	Scanning and Parsing Programming Language Grammars, Classification of Grammars, Ambiguity in grammar specification, Top Down Parser, LL (1) Parser, Bottom Up Parser and Operator Precedence Parser	06	15
3.	Compilers Causes of Large Semantic Gap, Binding and Binding Times, Compilation of Expressions, Code Optimization	03	15

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Implement Lexical Analyzer in C Language.	06
2.	Write a program to extract single line and multiline comment from an input program.	04
3.	Write a program to check if valid variable name is valid.	02
4.	Write a program to demonstrate effective use of STRTOK function in c.	02
5.	Write a program to accept following regular expression <ul style="list-style-type: none"> • ab*a* • xy*yx • (a/b)*ab(a/b) 	04
6.	Write a program to implement target code of an assembler	04
7.	Write a program to generate SYMTAB, LITTAB, TII and POOLTAB for a given assembly code	06
8.	Write a program to demonstrate Macro call and macro expansion.	02

Text Book(s):

Title	Author/s	Publication
System Programming	D M Dhamdhare	McGraw Hill Publication

Reference Book(s):

Title	Author/s	Publication
System Programming	Srimanta Pal	OXFORD Publication
System Programming and Compiler Construction	R.K. Maurya & A. Godbole	

Web Material Link(s):

- www.cs.jhu.edu/~scott/pl/lectures/parsing.html
- www.en.wikipedia.org/wiki/System_programming

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 60 Marks.

Practical:

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

Course Outcome(s):

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

- understand the execution process of HLL programs.
- understand the working of scanners and parsers.
- understand the basic design of various system software.
- implement various system software.