# Syllabus Book

# B. Tech.
# (Information Technology)

**P P Savani University**

School of Engineering

Effective From: 2019-20

Authored by: P P Savani University

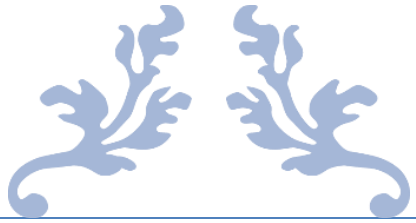
**P P SAVANI UNIVERSITY**

**SCHOOL OF ENGINEERING**

**TEACHING & EXAMINATION SCHEME FOR FOURTH YEAR B.TECH. INFORMATION TECHNOLOGY PROGRAMME AY 2019-20**

| 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 | SESH1070 | Fundamentals of Mathematics | SH | 2 | 0 | 2 | 4 | 4 | 40 | 60 | 0 | 0 | 50 | 0 | 150 |
| | SECV1040 | Basics of Civil & Mechanical Engineering | CV | 4 | 2 | 0 | 6 | 5 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SECE1050 | Programming for Problem Solving | CE | 3 | 4 | 0 | 7 | 5 | 40 | 60 | 40 | 60 | 0 | 0 | 200 |
| | SESH1240 | Electrical & Electronics Workshop | SH | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 50 | 0 | 0 | 0 | 50 |
| | SEPD1030 | Communicative English | SEPD | 1 | 2 | 0 | 3 | 2 | 50 | 0 | 20 | 30 | 0 | 0 | 100 |
| | | | | | | **Total** | **22** | **17** | | | | | | | **650** |
| 2 | SESH1080 | Linear Algebra & Calculus | SH | 3 | 0 | 2 | 5 | 5 | 40 | 60 | 0 | 0 | 50 | 0 | 150 |
| | SEIT1030 | Object Oriented Programming with Java | IT | 3 | 4 | 0 | 7 | 5 | 40 | 60 | 40 | 60 | 0 | 0 | 200 |
| | SEIT1010 | Introduction to Web Designing | IT | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 50 | 0 | 0 | 0 | 50 |
| | SEME1020 | Engineering Workshop | ME | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 50 | 0 | 0 | 0 | 50 |
| | SEME1040 | Concepts of Engineering Drawing | ME | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SESH1210 | Applied Physics | SH | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SEPD1020 | Communication Skills | SEPD | 1 | 2 | 0 | 3 | 2 | 50 | 0 | 20 | 30 | 0 | 0 | 100 |
| | | | | | | **Total** | **28** | **21** | | | | | | | **850** |

# CONTENT



# FIRST YEAR B. TECH.

**P P Savani University**
**School of Engineering**

**Department of Applied Science and Humanities**

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

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 2 | 0 | 2 | 4 | 40 | 60 | 0 | 0 | 50 | 0 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1 | **Calculus**<br>Limits, Continuity, Types of Discontinuity, Successive Differentiation, Rolle's Theorem, LMVT, CMVT, Maxima and Minima. | 8 | 28 |
| 2 | **Sequence and Series-I**<br>Convergence and Divergence, Comparison Test, Integral Test, Ratio Test, Root Test, Alternating Series, Absolute and Conditional Convergence. | 6 | 20 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1 | **Sequence and Series-II**<br>Power series, Taylor and Macluarin series, Indeterminate forms and L'Hospitals Rule. | 6 | 20 |
| 2 | **Matrix Algebra**<br>Elementary Row and Column operations, Inverse of matrix, Rank of matrix, System of Linear Equations, Characteristic | 10 | 32 |

| | | | |
|---|---|---|---|
| | Equation, Eigen values and Eigen vector, Diagonalization, Cayley Hamilton Theorem, Orthogonal Transformation | | |

**List of Tutorial:**

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

**Text Book(s):**

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

**Reference Book(s):**

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

**Course Evaluation:**

**Theory:**

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

**Tutorial:**

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

**Course Outcome(s):**

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

- make use of concepts of limit, continuity and differentiability for analysing mathematical problems.
- use concepts of Limit, Derivatives and Integrals.
- examine series for its convergence and divergence.
- solve linear system using matrices.

**P P Savani University**
**School of Engineering**

**Department of Civil Engineering**

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

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 4 | 2 | 0 | 5 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

**Course Content:**

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

| | | | |
|---|---|---|---|
| | Acting on Buildings, Building Components and their Functions, Types of Foundation and Importance, Symbols Used in Electrical Layout, Symbols Used for Water Supply, Plumbing and Sanitation | | |
| 4. | **Construction Equipment:**<br>Types of Equipment- Functions, Uses. Hauling Equipment- Truck, Dumper, Trailer. Hoisting Equipment- Pulley, Crane, Jack, Winch, Sheave Block, Fork Truck. Pneumatic Equipment-Compressor. Conveying Equipment- Package, Screw, Flight/scrap, Bucket, Belt Conveyor. Drill, Tractor, Ripper, Rim Pull, Dredger, Drag Line, Power Shovel, JCB, HOE. | 04 | 08 |
| 5. | **Recent Trends in Civil Engineering:**<br>Mass Transportation, Rapid Transportation, Smart City, Sky Scarper, Dams, Rain Water Harvesting, Batch Mix Plant, Ready Mix Concrete Plant, Green Building, Earth Quake Resisting Building, Smart Material | 06 | 12 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Basic Concepts of Thermodynamics:**<br>Prime Movers - Meaning and Classification; the Concept of Force, Pressure, Energy, Work, Power, System, Heat, Temperature, Specific Heat Capacity, Internal Energy, Specific Volume; Thermodynamic Systems, All Laws of Thermodynamics | 04 | 06 |
| 2. | **Fuels and Energy:**<br>Fuels Classification: Solid, Liquid and Gaseous; their Application, Energy Classification: Conventional and Non-Conventional Energy Sources, Introduction and Applications of Energy Sources like Fossil Fuels, Solar, Wind, and Bio-Fuels, LPG, CNG, Calorific Value | 04 | 06 |
| 3. | **Basics of Steam Generators:**<br>Introduction, Classification, Cochran, Lancashire and Babcock and Wilcox Boiler, Functioning of Different Mountings and Accessories | LAB | 12 |
| 4. | **Basics of I.C Engines:**<br>Construction and Working of 2 Stroke & 4 Stroke Petrol and Diesel Engines, Difference Between 2-Stroke - 4 Stroke Engine & Petrol-Diesel Engine, Efficiency of I. C. Engines | 12 | 14 |
| 5. | **Power Transmission Elements:**<br>Construction and Applications of Couplings, Clutches and Brakes, Difference Between Clutch and Coupling, Types of Belt Drive and Gear Drive | 10 | 12 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | Unit conversation Exercise and Chart preparation of building components | 02 |
| 2. | Linear measurements | 02 |
| 3. | Angular measurements | 02 |
| 4. | Determine R. L of given point by Dumpy level. (Without Change Point) | 02 |
| 5. | Determine R. L of given point by Dumpy level. (With Change Point) | 02 |
| 6. | Presentation on various topics as in module about recent trends | 04 |
| 7. | To understand construction and working of various types of boilers | 04 |
| 8. | To understand construction and working of mountings | 04 |
| 9. | To understand construction and working of accessories | 04 |
| 10. | To understand construction and working 2 –stroke & 4 –stroke Petrol Engines | 02 |
| 11. | To understand construction and working 2 –stroke & 4 –stroke Diesel Engines | 02 |

**Text Book(s):**

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

**Reference Book(s):**

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

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

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

**Practical:**

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

**Course Outcome(s):**

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

- know the principles and working of basic mechanical systems.
- comprehend importance of mechanical engineering in various fields of engineering.
- know about different civil engineering fields with an overview of building material, building construction and recent developments in civil engineering.

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

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

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 3 | 4 | 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 Computers:** Introduction, Central Processing Unit, Main Memory Unit, Interconnection of Units, Communication between Units of a Computer System. Memory Representation and Hierarchy, Random Access Memory, Read-only Memory, Classification of Secondary Storage Devices, Types of I/O Devices. Classification of Programming Languages, Generations of Programming Languages - Machine Language, Assembly Language, High-Level Language, 4GL. | 04 | 10 |
| 2. | **Introduction to C, Constants, Variables and Data Types:** Features of C Language, the Structure of C Program, Flow Charts and Algorithms Types of Errors, Debugging, Tracing the Execution of the Program, Watching Variables Values in Memory. Character Set, C Tokens, Keyword and Identifiers, Constants and Variables, Data Types - Declaration and Initialization, User Define Type Declarations - Typedef, Enum, Basic Input, and Output Operations, Symbolic Constants, Overflow and Underflow of Data. | 06 | 15 |

| | | | |
|---|---|---|---|
| 3. | **Operators, Expressions, and Managing I/O Operations:** Introduction to Operators and its Types, Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversions in Expressions, Operator Precedence and Associatively. Introduction to Reading a Character, Writing a Character, Formatted Input and Output. | 05 | 10 |
| 4. | **Conditional Statements:** Decision Making & Branching: Decision Making with If and If - else Statements, Nesting of If-else Statements, The Switch and go-to statements, Ternary (?:) Operator. Looping: The while Statement, The Break Statement & The Do. While loop, The FOR loop, Jump within loops - Programs. | 07 | 15 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Arrays:** Introduction, One-dimensional Arrays, Two-dimensional Arrays, Concept of Multidimensional Arrays. | 05 | 12 |
| 2. | **Strings:** Declaring and Initializing String Variables, Arithmetic Operations on Characters, Putting Strings Together, Comparison of Two Strings, String Handling Functions. | 04 | 10 |
| 3. | **User-Defined Functions:** Concepts of User-defined Functions, Prototypes, function Definition, Parameters, Parameter Passing, Calling a Function, Recursive Function, Macros and Macro Substitution | 04 | 10 |
| 4. | **Structure and Unions:** Introduction, Structure Definition, Declaring and Initializing Structure Variables, Accessing Structure Members, Copying & Comparison of Structures, Arrays of Structures, Arrays within Structures, Structures within Structures, Structures and Functions, Unions. | 04 | 08 |
| 5. | **Pointers and File Management:** Basics of Pointers, a Chain of Pointers, Pointer and Array, Pointer to an Array, an Array of Pointers, Pointers and Functions, Dynamic Memory Allocation. Introduction to file Management and its Functions. | 06 | 10 |

**List of Practical:**

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

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

**Text Book(s):**

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

**Reference Book(s):**

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

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

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

**Practical:**

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

**Course Outcome(s):**

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

- learn the fundamentals of programming.
- develop efficient programs with their own logic & capabilities.
- understand the syntax and semantics of the C language.

**P P Savani University**
**School of Engineering**

**Department of Mechanical Engineering**

Course Code: SEME1050
Course Name: Electrical & Electronics Workshop
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 0 | 2 | 0 | 1 | 0 | 0 | 50 | 0 | 0 | 0 | 50 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- expose to the fundamental principles, concepts, methods and circuits to understand the electronic system.
- learn to use common electronic component on breadboard.
- make the student understand about instruments and terminologies used in electrical & electronic circuits and their applications.

**List of Practical:**

| Sr. No | Name of Practical | Hours |
|---|---|---|
| 1. | Understanding of electronic components with their specifications | 2 |
| 2. | Understanding of Galvanometer, Voltmeter, Ammeter, Wattmeter and Multimeter | 2 |
| 3. | Understanding of breadboard connections | 2 |
| 4. | Drawing and wiring of basic circuits on breadboard | 2 |
| 5. | Verification of Ohm's law | 2 |
| 6. | Kirchhoff's laws (KVL, KCL) | 2 |
| 7. | Study of CRO, measurement of amplitude (voltage) & time period (frequency) | 4 |
| 8. | Half wave, full wave using centre tap transformer and full wave bridge rectifier | 4 |
| 9. | Electrical wiring system | 2 |
| 10. | Faraday's laws of Electromagnetic Induction and Electricity Lab | 2 |
| 11. | LDR characteristics | 2 |
| 12. | PCB designing | 4 |

**Text Book(s):**

| Title | Author(s) | Publication |
|---|---|---|
| Electronic Principles | Albert Malvino and David J Bates | Mc Graw Hill(7th Edition) |
| Principles of Electronics | V. K. Mehta, Rohit Mehta | S. Chand |

**Reference Book(s):**

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

**Course Evaluation:**

**Practical:**

- Continuous Evaluation consist of performance of practical which should be evaluated out of 10 for each practical and at the end of the semester the average of the same will be converted to 10 Marks.
- Internal viva consists of 20 marks.
- Internal practical performance of 20 marks at the end of the semester.

**Course Outcome(s):**

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

- understand and identify small basic electronic circuits used in day to day life.
- design and wire-up small circuits on breadboard.
- troubleshoot electronic circuits using basic instruments.
- design and prepare PCBs on their own.
- Identify electronic and electrical circuits will be developed in students.

**P P Savani University**
**School of Engineering**

**Center for Skill Enhancement and Professional Development**

Course Code: SEPD1030
Course Name: Communicative English
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 | |
| 1 | 2 | 00 | 02 | 50 | -- | 20 | 30 | -- | -- | 100 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- utilize their knowledge of grammar effectively for communicative purpose.
- learn language in authentic contexts.
- use English efficiently for routine.
- sharpen receptive skills for better comprehension by providing authentic resources.
- Enable themselves to express ideas clearly and accurately with fluent speaking & writing skills.
- gain confidence in speaking & writing English in an academic and professional context.
- analyze and improve pronunciation.

**Course Content:**

| Module No. | Content | Hours | Weightage in % |
|---|---|---|---|
| 1. | **Foundational Grammar & Vocabulary**<br>• Functional use of pronoun, adjective, adverb, preposition, and conjunction<br>• Narration of Past, Present and Future events<br>• Vocabulary | 03 | 20 |
| 2. | **Communicative English**<br>• Phrases to express likes/dislikes, request, inquiry, order, predict, complain, question, answer, invite (accepting/ denying)<br>• Idioms & Proverbs | 04 | 30 |
| 3. | **Receptive Skills**<br>• Introduction to Receptive Skills<br>• Techniques/strategies of Reading<br>• Techniques/strategies of Listening<br>• Types of Listening Skills | 04 | 25 |

| | | | |
|---|---|---|---|
| 4. | **Productive Skills**<br>• Speech modulation and its importance<br>• Phonetics and Transcription for effective pronunciation<br>• Speaking in various contexts<br>• Cohesion and Coherence/ Building Paragraphs<br>• Technical Writing (Application/ Letter/ Review/ Report)<br>• E-mail etiquettes | 04 | 25 |

**List of Practical:**

| Sr. No | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction to Foundational Grammar & Vocabulary – Ice Breaker | 02 |
| 2. | Foundational Grammar – practice of pronoun, adjective, adverb, preposition, and conjunction with context | 02 |
| 3. | Foundational Grammar – Narrating past, present and future events | 02 |
| 4. | Communicative English – exposure to structures & phrases to express various language functions | 02 |
| 5. | Communicative English – practice of using idioms, proverbs & phrases to communicate effectively | 02 |
| 6. | Communicative English – Role play for requesting, inquiring, ordering, predicting, complaining, questioning, answering, inviting (accepting/denying) | 02 |
| 7. | Communicative English – Role play for Requesting, inquiring, ordering, predicting, complaining, questioning, answering, inviting (accepting/denying) | 02 |
| 8. | Practice of reading through authentic resources – Summarizing and Paraphrasing. | 02 |
| 9. | Practice of reading through authentic resources – Skimming and Scanning | 02 |
| 10. | Comprehensive Listening: Note Taking and Note Making | 02 |
| 11. | Comprehensive Listening: Summarizing and Paraphrasing | 02 |
| 12. | Speech for Fluency – phonetics | 02 |
| 13. | Conversational Skills | 02 |
| 14. | Leave Application/ Request Letter/Business Letter | 02 |
| 15. | Notice/Memo/Agenda/ Minutes | 02 |

**Reference Book(s):**

| Title | Author(s) | Publication |
|---|---|---|
| Communicative English | Dr. Anuradha, Dr. Minal Batra | Nirmal Publishing, First edition (2016) |
| Communicative Grammar of English | Geoffrey Leech, Jan Sartvik | Longman, 3rd edition (6 January 2003) |
| Advanced Skills for Communication in English: Book I | V. Jaya Santhi | New century book house |
| Engineers' Guide to Technical Writing | Kenneth G. Budinski | ASM International, 2001 |

| | | |
|---|---|---|
| Communication Skills | Parul Popat & Kaushal Kotadia | Pearson, 2015 |
| Practical Techniques to Develop Communication Skills | Parul Popat & Kaushal Kotadia | Pothi Prakashan, 2015 |

**Web Material Link(s):**

- https://www.researchgate.net/publication/301351158_Advanced_Skills_for_Communication_in_English_Book_I
- https://anekawarnapendidikan.files.wordpress.com/2014/04/a-communicative-grammar-of-english-by-geoffrey-leech.pdf
- https://archive.org/details/FunctionalEnglish/page/n1
- https://www.talkenglish.com/grammar/grammar.aspx
- http://toefl.uobabylon.edu.iq/papers/itp_2015_3158553.pdf
- https://msu.edu/course/be/485/bewritingguideV2.0.pdf
- https://www.khanacademy.org
- http://www.kantakji.com/media/6494/t121.pdf

**Course Evaluation:**

**Theory:**

- Continuous Evaluation consists of two tests each of 30 marks and average of the same will be converted to 30 marks.
- There will be a submission consisting 10 marks as per the guidelines of course coordinator.
- Faculty Evaluation consists of 10 marks as per the guidelines provided by the Course Coordinator.

**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/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

- expand his/her vocabulary.
- use variety of sentence structures.
- use English effectively in academic and professional spectrum.
- enhance comprehensive listening.
- write English effectively with improved grammar and vocabulary.
- practice strategies for comprehensive reading in English.
- speak English fluently and efficiently.
- effectively use LSRW skills in English.

**P P Savani University**
**School of Engineering**

**Department of Applied Science and Humanities**

Course Code: SESH1080
Course Name: Linear Algebra & Calculus
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 3 | 0 | 2 | 5 | 40 | 60 | - | - | 50 | 0 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Vector Space**<br>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. | 9 | 20 |
| 2. | **Linear Transformation**<br>Introduction of Linear Transformation, Kernal and Range, Rank and Nullity, Inverse of Linear Transformation, Rank Nullity Theorem, Composition of Linear Maps, Matrix associated with linear map. | 7 | 15 |
| 3. | **Inner Product Space**<br>Inner Product, Angle and Orthogonality, Orthogonal projection, Gram- Schmidt process and QR Decomposition, Least square decomposition, Change of basis. | 7 | 15 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Beta and Gamma function**<br>Improper Integrals, Convergence, Properties of Beta and Gamma Function, Duplication Formula (without proof) | 6 | 14 |

| | | | |
|---|---|---|---|
| 2. | **Fourier Series**<br>Periodic Function, Euler Formula, Arbitrary Period, Even and Odd function, Half Range Expansion, Parseval's Theorem | 8 | 18 |
| 3. | **Curve tracing**<br>Tracing of Cartesian Curves, Polar Coordinates, Polar and Parametric Form of Standard Curves, Areas and Length in Polar co-ordinates | 8 | 18 |

**List of Tutorial:**

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

**Text Book(s):**

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

**Reference Book(s):**

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

**Course Evaluation:**

**Theory:**

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

**Tutorial:**

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

**Course Outcome(s):**

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

- understand the concepts of Vector Space, Linear Transformation and inner product
- space.
- evaluate functions like Gamma, Beta functions & their relation which is helpful to evaluate some definite integral arising in various branch of engineering.
- understand the concept of Fourier series.

**P P Savani University**
**School of Engineering**

**Department of Information Technology**

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

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 3 | 4 | 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 basics of object oriented programming.
- identify appropriate approach to computational problems.
- develop logic building and problem-solving skills.

**Course Content:**

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

| | | | |
|---|---|---|---|
| 4. | **Class and Inheritance**<br>Use and Benefits of Inheritance in OOP, Types of Inheritance in Java, Inheriting Data Members and Methods, Role of Constructors in inheritance, Overriding Super Class Methods, Use of "super", Polymorphism in inheritance, Type Compatibility and Conversion, Implementing interfaces. | 07 | 15 |
| 5. | **Java Packages**<br>Organizing Classes and Interfaces in Packages, Package as Access Protection, Defining Package, CLASSPATH Setting for Packages, Making JAR Files for Library Packages, Import and Static Import, Naming Convention for Packages. | 02 | 05 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Array and String Concepts**<br>Defining an Array, Initializing & Accessing Array, Multi-Dimensional Array, Operation on String, Using Collection Bases Loop for String, tokenizing a String, Creating Strings using String Buffer. | 04 | 10 |
| 2. | **Exception Handling**<br>The Idea behind Exception, Exceptions & Errors, Types of Exception, Control Flow In Exceptions, JVM reaction to Exceptions, Use of try, catch, finally, throw, throw in Exception Handling, In-built and User Defined Exceptions, Checked and Un-Checked Exceptions. | 05 | 10 |
| 3. | **Thread**<br>Understanding Threads, Needs of Multi-Threaded Programming, Thread Life-Cycle, Thread Priorities, Synchronizing Threads, InterCommunication of Threads. | 06 | 15 |
| 4. | **Applet**<br>Applet & Application, Applet Architecture, Parameters to Applet. | 03 | 05 |
| 5. | **Input-Output Operations in Java**<br>Streams and the new I/O Capabilities, Understanding Streams, The Classes for Input and Output, The Standard Streams, Working with File Object, File I/O Basics, Reading and Writing to Files, Buffer and Buffer Management, Read/Write Operations with File, Channel, Serializing Objects. | 04 | 10 |

**List of Practical:**

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

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

**Text Book(s):**

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

**Reference Book(s):**

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

**Web Material Link(s):**

- https://www.coursera.org/learn/object-oriented-java

**Course Evaluation:**

**Theory:**

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

**Practical:**

- Continuous Evaluation consists of the performance of practical, which will be evaluated out of 10 per each practical and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks.
- External viva consists of 30 marks.

**Course Outcome(s):**

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

- learn the fundamentals of object-oriented programming.
- develop efficient programs with their own logic & capabilities.
- understand the syntax and semantics of the 'Java' language.

**P P Savani University**
**School of Engineering**

## Department of Information Technology

Course Code: SEIT1010
Course Name: Introduction to Web Designing
Course Prerequisite(s): --

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 0 | 2 | 0 | 1 | 0 | 0 | 50 | 0 | 0 | 0 | 50 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

**Course Content:**

| Module No. | Content | Hours | Weightage in % |
|---|---|---|---|
| 1. | Introduction to World Wide Web, Web Server, Website, Website design Principles, Planning the Website, Navigation, Introduction to HTML, CSS, Java Script | 30 | 100% |

**List of Practical:**

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

**Reference Book:**

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

**Web Material Link(s):**

- https://www.w3schools.com/

**Course Evaluation:**

**Practical:**

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

**Course Outcome(s):**

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

- learn the fundamentals of website designing.
- apply knowledge of HTML, CSS, and JavaScript to build static and dynamic websites.

**P P Savani University**
**School of Engineering**

## Department of Information Technology

Course Code: SEME1020
Course Name: Engineering Workshop
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 0 | 2 | 0 | 1 | 0 | 0 | 50 | 0 | 0 | 0 | 50 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction:** Introduction to Various Shops / Sections and Workshop Layouts, Safety Norms to be Followed in a Workshop. | - | - |
| 2. | **Fitting Shop:** Introduction of Fitting Shop; Safety; Making a Job as per Drawing including Marking and other Performing Operations. | - | - |
| 3. | **Carpentry and Drilling Shop:** Introduction of Carpentry Shop; Preparation of Job as per Drawing including Marking and other Performing Operations. | - | - |
| 4. | **Sheet Metal Shop:** Introduction of Sheet Metal Shop; Preparation of Job as per Drawing including Marking and other Performing Operations | - | - |
| 5. | **Smithy Shop:** Introduction of Sheet Metal Shop; Preparation of Job as per Drawing including Marking and other Performing Operations | - | - |
| 6. | **Introduction to Machine Tools:** Introduction and Demonstration of various Machine Tools like Lathe, Drilling, Grinding, Hack Saw Cutting etc. | - | - |

| | | | |
|---|---|---|---|
| 7. | **Introduction to Welding & Plumbing:**<br>Introduction and Demonstration of Welding process.<br>Introduction and Demonstration of Plumbing Shop. | - | - |

**List of Practical:**

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

**Text Book(s):**

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

**Reference Book(s):**

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

**Web Material Link(s):**

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

**Course Evaluation:**

**Practical:**

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

**Course Outcome(s):**

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

- use various measuring instruments.
- know the importance of safety norms required in workshop.
- understand the application of various tools required for different operation.
- understand how to manufacture product from given raw material.
- know the use of machine tools, hand tools and power tools.

**P P Savani University**
**School of Engineering**

## Department of Mechanical Engineering

Course Code: SEME1040
Course Name: Concepts of Engineering Drawing
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 3 | 2 | 0 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- know conventions and the methods of engineering drawing.
- 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.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction:** Importance of the course; Use of Drawing Instruments and Accessories; BIS – SP – 46; Lettering, Dimensioning and Lines; Representative Fraction; Types of Scales (Plain and Diagonal Scales); Construction of Polygons | 07 | 15 |
| 2. | **Engineering Curves:** Classification and Application of Engineering Curves; Construction of Conics, Cycloidal Curves, Involutes and Spiral along with Normal and Tangent to each. | 12 | 25 |
| 3. | **Principles of Projections:** Types of Projections; Introduction of Principle Planes of Projections. Projection of Points in all four Quadrants | 04 | 10 |

| Section II | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Projection of Plane:** Projection of Planes (Circular and Polygonal) with inclination to one Referral Plane and two Referral Planes | 07 | 15 |
| 2. | **Orthographic Projection:** Types of Projections: Principle of First and Third Angle Projection -Applications & Difference; Projection from Pictorial View of Object, View from Front, Top and Sides. | 08 | 20 |
| 3. | **Isometric Projections and Isometric Drawing:** Isometric Scale, Conversion of Orthographic Views into Isometric Projection, Isometric View or Drawing. | 07 | 15 |

**List of Practical:**

| Sr. No | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction sheet (dimensioning methods, different types of line, construction of different polygon, divide the line and angle in parts, use of stencil, lettering) | 04 |
| 2. | Plane scale and Diagonal scale | 04 |
| 3. | Engineering curves | 06 |
| 4. | Projection of Points and Plane | 04 |
| 5. | Orthographic Projection | 06 |
| 6. | Isometric Projection | 06 |

**Text Book(s):**

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

**Reference Book(s):**

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

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

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

**Practical:**

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

**Course Outcome(s):**

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

- know and understand "Drawing is a language of Engineers."
- interpret general assembly technical drawing.
- create traditions and the strategies for Engineering Drawing.
- evaluate basic and intermediate geometry.
- apply the knowledge of principles of projections.
- develop their hallucination/imagination skills.
- enhance their technical communication skill in the form of talkative drawings.

**P P Savani University**
**School of Engineering**

## Department of Applied Science & Humanities

Course Code: SESH1210
Course Name: Applied Physics
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 3 | 2 | 0 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

**Course Content:**

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

| | | | |
|---|---|---|---|
| | Nanotechnology, Unusual Properties of Nanomaterials, Synthesis of Nanomaterials, Applications of Nanomaterials | | |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Non Linear Optics:**<br>Laser, Spontaneous and Stimulated Emission of Light, Applications of Laser.<br>Fundamental Ideas about Optical Fibre, Advantages of Optical Fibre of Optical Fibre, Applications of Optical Fibre. | 07 | 12 |
| 2. | **DC and AC Circuits Fundamentals**<br>Introduction of Electrical Current, Voltage, Power and Energy; Sources of Electrical Energy Inductor and Capacitor, Fundamental Laws of Electric Circuits – Ohm's Law and Kirchhoff's Laws; Analysis of Series, Parallel and Series-Parallel Circuits.<br>Alternating Voltages and Currents and their Vector and Time Domain Representations, Average and Rms Values, From Factor, Phase Difference, Power and Power Factor, Purely Resistive Inductive and Capacitive Circuits, R-L, R-C, R-L-C Series Circuits, Impedance and Admittance, Circuits in Parallel, Series and Parallel Resonance. | 08 | 25 |
| 3. | **Electronics:**<br>Semiconductors, Intrinsic and Extrinsic Semiconductor Advantages of Semiconductor Devices, Diodes, Transistors, Types of Bipolar Junction Transistor, Unijunction Junction Transistor, FET and MOSFETS. | 07 | 13 |

**List of Practical:**

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

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Concept of the Modern Physics | A. Beiser | Tata McGraw-Hill Education |
| Basic electrical engineering | Kothari and Nagrath | Tata McGraw-Hill Education |
| Quantum Mechanics | P.M. Mathew, K. Venkatesan | Tata McGraw-Hill Education |
| Waves and Acoustics | Pradipkumar Chakrabarti Satyabrata Chawdhary | New Central Book Agency |
| Lasers and Nonlinear Optics | G.D. Baruah | Pragati Prakashan |
| Solid State Physics:<br>Basic Electronics: | S.O. Pillai | New Age Internation Publishers |
| Basic Electronics for Scientists and Engineers | Dennis L. Eggleston | Cambridge University Press |

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

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

**Practical:**

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

**Course Outcome(s):**

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

- use appropriate mathematical techniques and concepts to obtain quantitative solutions to problems in physics & electrical.
- perform a literature search, to make use of appropriate computational of laboratory skill, and to make an effective written or oral presentation of the results of the project.

**P P Savani University**
**School of Engineering**

## Center for Skill Enhancement and Professional Development

Course Code: SEPD1020
Course Name: Communication Skills
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 01 | 02 | 00 | 02 | 50 | 00 | 20 | 30 | -- | -- | 100 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- hone basic communication skills by exposing them to the key communication techniques.
- improvise comprehension and expressional skills which are required for personal, social, academic and professional environment.
- sharpen communication skills with reference to organizational structure.
- show the importance of team work and give practice in group communication with reference to group dynamics.

**Course Content:**

| Module No. | Content | Hours | Weightage in % |
|---|---|---|---|
| 1. | **Introduction to Communication Skills**<br>• Concept and Process of Communication<br>• Types of Communication<br>• Principles of Effective Communication<br>• Barriers to Communication | 05 | 33 |
| 2. | **Interpersonal Organizational Communication**<br>• Styles and Flows of Communication<br>• Essentials of Organizational Communication<br>• Kinesics, Proxemics and Chronemics | 03 | 20 |
| 3. | **Team/ Group Dynamics and Leadership**<br>• Types of Groups and Essentials of Group Work and Networking<br>• Concept and Types of Leadership<br>• Traits of an Effective Leader | 03 | 20 |
| 4. | **Presentation Skills**<br>• Modes, Means and Purposes of Presentation<br>• Audience Analysis and Content Organization<br>• Visual aids and Nuances of Delivery<br>• Non Verbal Cues for Effective Presentation | 04 | 27 |

**List of Practical:**

| Sr. No | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction to Communication: An Ice Breaker | 02 |
| 2. | Verbal/ Non-Verbal Communication Pros and Cons | 02 |
| 3. | Principles of Communication | 02 |
| 4. | Barriers to Communication | 02 |
| 5. | Interpersonal Communication | 02 |
| 6. | Organizational Communication | 02 |
| 7. | Assertive Vs Aggressive Communication | 02 |
| 8. | Group Dynamics: A Decision-Making Activity | 02 |
| 9. | Group Dynamics Working together to achieve organizational vision | 02 |
| 10. | Difference between Group Discussion and Debate | 02 |
| 11. | Leadership: Holding a diverse Group Together | 02 |
| 12. | Presentation Skills; Video Session | 02 |
| 13. | Presentations by the student: Self-Peer-teacher assessment | 02 |
| 14. | Presentations by the student: Self-Peer-teacher assessment | 02 |
| 15. | Presentations by the student: Self-Peer-teacher assessment | 02 |

**Text Book(s):**

| Title | Author(s) | Publication |
|---|---|---|
| Practical Techniques to Develop Communication Skills | Parul Popat & Kaushal Kotadia | Pothi Prakashan, 2015 |

**Reference Book(s):**

| Title | Author(s) | Publication |
|---|---|---|
| Communication Skills | Parul Popat & Kaushal Kotadia | Pearson, 2015 |
| Communication Skills, Second Edition | Sanjay Kumar, Pushp Lata | Oxford University Press,2015 |
| Communication Skills for Engineers | Sunita Mishra | Pearson, 2011 |
| Effective Interpersonal and Team Communication Skills for Engineers | Clifford Whitcomb, Leslie E. Whitcomb | John Wiley & Sons, 2012 |

**Web Material Link(s):**

- http://www.mindtools.com/page8.html
- http://techpreparation.com/soft-skills.htm?gclid=CJf34fyQv5wCFdMtpAodjjX_tA
- http://lorien.ncl.ac.uk/ming/Dept/Tips/present/comms.htm

**Course Evaluation:**

**Theory:**

- Continuous Evaluation consists two tests each of 30 marks and average of the same will be converted to 30 marks.
- There will be a submission consisting 10 marks as per the guidelines of course coordinator.
- Faculty Evaluation consists of 10 marks as per the guidelines provided by the Course Coordinator.

**Practical:**

- Continuous Evaluation consists of Performance of Practical which should be evaluated out of 10 for each practical.
- Internal viva consists of 10 marks.
- Practical performance/quiz/drawing/test of 15 marks during End Semester Exam.
- Viva/Oral performance of 15 marks during End Semester Exam.

**Course Outcome(s):**

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

- follow the process of communication and its components in organizational context.
- express themselves and to participate in the classroom discussions and other such academic activities.
- comprehend whatever they receive from Informal Interactions with the family, teachers and friends; and from Formal Communications taking Place in Lectures, Laboratories and the like.
- enhance the teamwork and collaborative attitude.
- communicate effectively using suitable styles and techniques.
- able to participate in the group discussions and other such academic or academic support activities.
- use language effectively with reference to communication in groups and group behaviour.

# SECOND YEAR B. TECH.

| P P SAVANI UNIVERSITY | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCHOOL OF ENGINEERING | | | | | | | | | | | | | | | |
| TEACHING & EXAMINATION SCHEME FOR B. TECH. INFORMATION TECHNOLOGY PROGRAMME AY: 2019-20 | | | | | | | | | | | | | | | |
| 3 | SESH2040 | Discrete Mathematics | SH | 3 | 0 | 2 | 5 | 5 | 40 | 60 | 0 | 0 | 50 | 0 | 150 |
| | SECE2011 | Database Management System | CE | 3 | 4 | 0 | 7 | 5 | 40 | 60 | 40 | 60 | 0 | 0 | 200 |
| | SECE2060 | Programming with Python | CE | 3 | 4 | 0 | 7 | 5 | 40 | 60 | 40 | 60 | 0 | 0 | 200 |
| | SECE2021 | Digital Workshop | CE | 0 | 2 | 0 | 2 | 2 | 0 | 0 | 20 | 30 | 0 | 0 | 50 |
| | SECE2031 | Data Structures | CE | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SEPD2010 | Critical Thinking, Creativity & Decision Making | SEPD | 2 | 0 | 0 | 2 | 2 | 40 | 60 | 0 | 0 | 0 | 0 | 100 |
| | SEPD3040 | Integrated Personality Development Course-I | SEPD | 2 | 0 | 0 | 2 | 1 | 40 | 60 | 0 | 0 | 0 | 0 | 100 |
| | SECE2910 | Industrial Exposure | CE | 2 | | | 0 | 2 | 0 | 0 | 100 | 0 | 0 | 0 | 100 |
| | | | | | | **Total** | **30** | **26** | | | | | | | **1050** |
| 4 | SESH2051 | Mathematical Methods for Computation | SH | 3 | 0 | 2 | 5 | 5 | 40 | 60 | 0 | 0 | 50 | 0 | 150 |
| | SEIT2021 | Mobile Application Development | IT | 3 | 4 | 0 | 7 | 5 | 40 | 60 | 40 | 60 | 0 | 0 | 200 |
| | SEIT2031 | Operating System | IT | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SECE2040 | Computer Organization | CE | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SECE2051 | Computer Graphics & Multimedia | CE | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | CFLS3010 | Foreign Language - I | CFLS | 2 | | | 2 | 2 | 40 | 60 | 0 | 0 | 0 | 0 | 100 |
| | SEPD3050 | Integrated Personality Development Course-II | SEPD | 2 | 0 | 0 | 2 | 1 | 40 | 60 | 0 | 0 | 0 | 0 | 100 |
| | | | | | | **Total** | **31** | **23** | | | | | | | **1000** |

**P P Savani University**
**School of Engineering**

**Department of Science & Humanities**

Course Code: SESH2040
Course Name: Discrete Mathematics
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 00 | 02 | 05 | 40 | 60 | 00 | 00 | 50 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- 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**<br>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, Composition of function, Recursive function | 08 | 17 |
| 2. | **Lattices**<br>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**<br>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 % |
| 1. | **Mathematical Logic and Proof**<br>Propositions, logical operators, Algebra of proposition, Predicates & quantifiers, Nested Quantifiers, Rules of Inference, Proof Methods, Program Correctness techniques. | 06 | 14 |
| 2. | **Graph Theory**<br>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 |
| 3. | **Tree**<br>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 |

**List of Tutorial(s):**

| Sr. No. | Name of Tutorial | 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 |

**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.<br>New Delhi. |

**Web Material Link(s):**

- http://nptel.ac.in/courses/111107058/
- http://nptel.ac.in/courses/111106086/
- http://nptel.ac.in/courses/111104026/

**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.

**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 30 marks.
- MCQ based examination consists of 10 marks.
- Internal viva consists of 10 marks.

**Course Outcome(s):**

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

- use concepts of set theory for understanding and fetching data from database using query.
- apply knowledge of group theory for data encryption.
- design and use foundational concepts of notations and results of graph theory in information storage and retrieval.
- apply the basic concepts of spanning tree algorithm namely DFA, BFS, Prim's and Kruskal's in the design of networks.

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

Course Code: SECE2011
Course Name: Database Management System
Prerequisite Course(s): Programming for Problem Solving (SECE1050)

**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

- 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**<br>File Organization, Comparison of File with DBMS, Application of DBMS, Purpose of DBMS, Views of data - level of abstraction, data independence, database architecture, database users & administrators. | 04 | 10 |
| 2. | **Relational Model**<br>Structure of relational databases, Domains, Relations, Relational algebra- operators and syntax, Relational algebra queries. | 04 | 10 |
| 3. | **SQL Concepts**<br>Basics of SQL, DDL, DML, DCL, Structure: creation, alteration, Defining constraints: Primary key, Foreign key, Unique key, Not null, check, IN operator, Aggregate functions, Built-in functions: numeric, date, string functions, set operations, Subqueries, correlated sub-queries: Join, Exist, Any, All, view and its types. Transaction control commands- Commit, Rollback, Savepoint. | 10 | 22 |
| 4. | **Query Processing**<br>Overview, Measures of query cost, Selection operation, Sorting, Join, Evaluation of expressions. | 04 | 8 |

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

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction to DBMS, SQL, and SQL tools. | 02 |
| 2. | Implementation of a client-server architecture using TightVNC Server and Client software (remote access of a server by clients) | 02 |
| 3. | Introduction to Data Dictionary concepts. | 02 |
| 4. | Create all the master tables using Data Definition Language Commands like Create and Describe. | 02 |
| 5. | Implement the use of alter table command. | 02 |
| 6. | Introduction to Transaction Control Commands like Commit, Rollback and Save point. | 02 |
| 7. | Use insert command to add data into created tables. | 02 |
| 8. | Solve queries using update command. | 02 |
| 9. | Implement SQL queries based on update and delete command. | 02 |
| 10. | Write SQL queries to solve problems with the use of the select command. | 02 |
| 11. | Generate different reports using select command. | 02 |
| 12. | Introduction to SQL functions. | 02 |
| 13. | Write SQL scripts to implement the listed queries, which require the usage of numerous SQL functions. | 02 |
| 14. | Introduction to group functions and demonstration of their usage. | 02 |
| 15. | Implement queries based on group by and having a clause. | 02 |
| 16. | Execution of queries based on natural and inner joins. | 02 |
| 17. | Implement SQL queries based on outer join and self-join. | 02 |

| | | |
|---|---|---|
| 18. | Write SQL queries based on group function and join. | 02 |
| 19. | Introduction to sub-queries and demonstration of their usage. | 02 |
| 20. | Write SQL queries based on the concept of single row sub-queries. | 02 |
| 21. | Write SQL queries based on the concept of multiple row sub-queries. | 02 |
| 22. | Write SQL scripts to generate desired reports using group by, join and sub-queries. | 02 |
| 23. | Write SQL script to solve the questions based on all SQL concepts. | 02 |
| 24. | Write the required SQL scripts to implement all the listed queries using Data Control Commands like Grant and Revoke. | 02 |
| 25. | Introduction to different objects in SQL and create views based on given scenarios. | 02 |
| 26. | Write the required SQL script to implement the given triggers. | 02 |
| 27. | Write the required SQL script to implement the given triggers. | 02 |
| 28. | Write the required SQL script to implement the given functions and procedures using PL/SQL block scripts. | 02 |
| 29. | Write the SQL scripts to implement the given cursors. | 02 |
| 30. | Submission of DBMS Mini Project Design. | 02 |

**Text Book(s):**

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

**Reference Book(s):**

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

**Web Material Link(s):**

- https://nptel.ac.in/courses/106105175/

**Course Evaluation:**

**Theory:**

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

**Practical:**

- Continuous Evaluation consists of the performance of practical, which will be evaluated out of 10 marks per each practical and the average of the entire practical will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks.
- External viva consists of 30 marks.

**Course Outcome(s):**

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

- convert physical, data, conceptual data into relational databases.
- utilize database design for the development of software projects.
- apply various database constraints on relational databases.

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

Course Code: SECE1040
Course Name: Programming with Python
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

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

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

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction to Python**<br>History, Features of Python, Applications of Python, Working with Python, Input and Output Functions in Python, Variable Types, Basic Operators and Types of Data Int, Float, Complex, String, List, Tuple, Set, Dictionary and its Methods. | 03 | 6 |
| 2. | **Decision Structures in Python**<br>Conditional Blocks Using if, Else and Else If, Simple for Loops in Python, For Loop Using Ranges, String, List and Dictionaries Use of While Loops in Python, Loop Manipulation Using Pass, Continue, Break and Else. | 04 | 5 |
| 3. | **Array and Strings in Python**<br>Arrays, Basic Strings, Accessing Strings, Basic Operations, String Slicing, Testing, Searching and Manipulating Strings, Function and Methods. | 03 | 8 |
| 4. | **Dictionary, List, Tuples and Sets**<br>Dictionaries, Accessing Values in Dictionaries, Working with Dictionaries, Properties, Functions and Methods. Sets, Accessing Values in Set, Working with Set, Properties, Functions and Methods, Tuple, Accessing | 06 | 8 |

| | | | |
|---|---|---|---|
| | Tuples, Operations, Working, Functions and Methods. List, Accessing List, Operations, Working With Lists, Function and methods, two-dimensional lists. | | |
| 5. | **Functions, Modules and Packages in Python**<br>Introduction to Functions, Defining a Function, Calling a Function, Types of Functions, Function Arguments, Anonymous Functions, Global and Local Variables, Importing Module, Math Module, Random Module, Introduction to Packages: Numpy, Pandas, Matplotlib. | 07 | 13 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Python Object Oriented Programming**<br>OOP Concept of Class, Object and Instances, Constructor, Class, Attributes, Methods, Using Properties to Control Attribute Access, and Destructors, Inheritance, Overlapping and Overloading Operators. (29-36) 16-4-19<br>Objects in Python: Creating Python Classes, Modules and Packages, Inheritance in Python, Polymorphism in Python. | 08 | 19 |
| 2. | **Files in Python**<br>Introduction to File Input and Output, Writing Data to a File, Reading Data From a File, Additional File Methods, Using Loops to Process Files, Processing Records. | 07 | 15 |
| 3. | **Regular Expression in Python**<br>RE Module, Basic Patterns, Regular Expression Syntax, Regular Expression Object, Match Object, Search Object, Findall method, Split method, Sub Method. | 03 | 7 |
| 4. | **Exception Handling in Python**<br>Handling IO Exceptions, Working with Directories, Metadata, Errors, Run Time Errors, The Exception Model, Exception Hierarchy, Handling Multiple Exceptions, Throwing Mechanism, Caching Mechanism | 04 | 9 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction to Python (Introduction to IDLE, different data types, Input Output in Python, Operators, Operator precedence). | 10 |
| 2. | Working with Strings. | 08 |
| 3. | Implementation of Dictionaries, Sets, Tuples and Lists and its various methods in Python. | 10 |
| 4. | Working with decision structures in Python | 08 |
| 5. | Working with functions and modules in Python | 04 |
| 6. | Working with Object-oriented paradigms in Python | 06 |
| 7. | Implementation of file handling in Python. | 04 |
| 8. | Working with RE module in Python. | 06 |
| 9. | Exception handling in Python. | 04 |

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

**Text Book(s):**

| Title | Author(s) | Publication |
|---|---|---|
| Python Programming: A modular approach | Sheetal Taneja, Naveen Kumar | Pearson |
| Think Python: How to Think Like a Computer Scientist | Allen Downey | Green Tea Press |

**Reference Book(s):**

| Title | Author(s) | Publication |
|---|---|---|
| Python Cookbook | David Ascher, Alex Martelli Oreilly | O Reilly Media |

**Web Material Link(s):**

- 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 student will be able to

- develop efficient programs with their own logic & capabilities using Python language.
- understand the syntax and semantics of the 'Python' language.
- apply Python programming principles.

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

Course Code: SECE2021
Course Name: Digital Workshop
Prerequisite Course(s): Programming for problem solving (SECE1050)

**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 | 02 | 00 | 02 | 00 | 00 | 20 | 30 | 00 | 00 | 50 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand the core concepts of digital logic design like number base representation, boolean algebra etc.
- develop the ability to design combinational and sequential circuits.

**Course Content:**
**List of Practical:**

| Sr. No | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction to Binary system. | 4 |
| 2. | Introduction to Boolean Algebra and Logic Gates. | 4 |
| 3. | Study and verification of all logic gates. | 2 |
| 4. | Design and Implementation of Half Adder, Half Subtractor circuits. | 2 |
| 5. | Design and Implementation Full Adder and Full Subtractor circuits. | 2 |
| 6. | Comparator, Decoders, Multiplexers. | 4 |
| 7. | Realization of Sum of Product and Product of Sum expression using universal gates. | 2 |
| 8. | Design and Implementation of Parity Generator and Checker circuits. | 2 |
| 9. | Introduction to sequential Circuit: S-R Latch. | 4 |
| 10. | Introduction to sequential Circuit: Flip-Fop. | 4 |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Digital Electronic Principles and Integrated Circuit | Anil K. Maini | Wiley |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Digital Circuits and Logic Design | Samuel C. Lee | Prentice Hall India Learning Pvt Ltd. |
| Digital Logic and Computer Design | M. Morris Mano | Pearson |
| Fundamentals of Digital Electronics and Circuits | Anand Kumar | Prentice Hall India Learning Pvt Ltd. |

**Course Evaluation:**

**Practical:**

- Continuous Evaluation consists of the performance of practical, which will be evaluated out of 10 per each practical and average of the same will be converted to 20 marks.
- Practical performance/quiz/test consists of 15 marks.
- External viva consists of 15 marks.

**Course Outcome(s):**

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

- learn the fundamentals of digital logic design.
- design elementary combinational and sequential circuits using Boolean algebra and karnaugh map.

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

Course Code: SECE2031
Course Name: Data Structures
Prerequisite Course(s): Programming for Problem Solving (SECE1050)

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 02 | 00 | 04 | 40 | 60 | 20 | 30 | 00 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

**Objective(s) of the Course:**
To help learners to
- 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**<br>Object and Instance, Object-Oriented Concepts, Data types, Types of Data Structure, Abstract Data Types. | 04 | 10 |
| 2. | **Array**<br>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**<br>Linear Search, Binary Search, Bubble Sort, Insertion Sort, Selection Sort, Radix sort. | 04 | 10 |
| 4. | **Stack and Queue**<br>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**<br>Dynamic Memory Allocation, Structure in C, Singly Linked List, Doubly Linked List, circular linked list. | 03 | 5 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Linked List-II and Applications of Linked List**<br>Linked implementation of Stack, Linked implementation of Queue, Applications of Linked List. | 03 | 8 |
| 2. | **Trees and Graphs**<br>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 Binary Tree, Heap, Binary Search Tree. Tree for Huffman coding, 2-3 Tree, AVL tree, Breadth First Search, Depth First Search, Spanning Tree, Kruskal's and Prim's Minimum Cost Spanning Tree Algorithms, Dijkstra's Shortest Path Algorithm. | 12 | 25 |
| 3. | **Hashing**<br>The Symbol Table Abstract Data Types, Hash Tables, Hashing Functions, Hash collision Resolution Technique, Linear Probing. | 04 | 10 |
| 4. | **File Structures**<br>Concepts of fields, records and files, Sequential, Indexed, and Relative/Random File Organization. | 04 | 07 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction to Dynamic Memory Allocation | 02 |
| 2. | Implementation of Structure in C. | 02 |
| 3. | Write a program to perform Insertion sort. | 02 |
| 4. | Write a program to perform Selection sort. | 02 |
| 5. | Write a program to perform Bubble sort. | 02 |
| 6. | Write a program to perform Linear Search. | 02 |
| 7. | Write a program to perform Binary Search. | 02 |
| 8. | Write a program to implement a stack and perform push, pop operation. | 02 |
| 9. | Write a program to perform the following operations in a linear queue – Addition, Deletion, and Traversing. | 02 |
| 10. | Write a program to perform the following operations in the circular queue – Addition, Deletion, and Traversing. | 02 |
| 11. | Write a program to perform the following operations in singly linked list – Creation, Insertion, and Deletion. | 02 |
| 12. | Write a program to perform the following operations in doubly linked list – Creation, Insertion, and Deletion | 02 |
| 13. | Write a program to create a binary tree and perform – Insertion, Deletion, and Traversal. | 02 |

| | | |
|---|---|---|
| 14. | Write a program to create a binary search tree and perform – Insertion, Deletion, and Traversal. | 02 |
| 15. | Write a program for traversal of graph (B.F.S., D.F.S.). | 02 |

**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, which will be converted out of 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

**Practical:**

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

**Course Outcome(s):**

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

- differentiate primitive and non-primitive structures.
- design and apply appropriate data structures for solving computing problems.
- implement different data structures.
- apply sorting and searching algorithms to the small and large datasets.
- analyze algorithms for specific problems.

**P P Savani University**
**School of Engineering**

**Centre for Skill Enhancement & Professional Development**

Course Code: SEPD2010
Course Name: Critical Thinking, Creativity and Decision Making
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

**Course Content:**

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

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

**Text Book (s)**

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

**Reference Book (s):**

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

**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.

**Course Outcome(s):**

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

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

## P P Savani University

## Integrated Personality Development Course

Course Code: SEPD3040
Course Name: IPDC-1

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 02 | 00 | 00 | 01 | 40 | 60 | 00 | 00 | -- | -- | 100 |

CE: Continuous Evaluation, ESE: End Semester Exam

**Objective(s) of the Course:**

To help learners to

- provide students with a holistic education – focused on increasing their intelligence quotient, physical quotient, emotional quotient and spiritual quotient
- provide students with hard and soft skills, making them more marketable when entering the workforce
- educate students on their social responsibilities as citizens of India
- provide students with a value-based education which will enable them to be successful in their family, professional, and social relationships.
- teach self-analysis and self-improvement exercises to enhance the potential of the participants.

**Course Content:**

| Lecture No. | Content | Hours | Weightage in % |
|---|---|---|---|
| 1. | • Remaking Yourself<br>- Restructuring Yourself. | 02 | 50 |
| 2. | • Remaking Yourself<br>- Power of Habit. | 02 | |
| 3. | • Remaking Yourself<br>-Developing Effective Habits. | 02 | |
| 4. | • Learning from Legends<br>- Tendulkar and Ratan Tata | 02 | |
| 5. | • From House To Home<br>Affectionate Relationship | 02 | |
| 6. | • Facing Failures<br>- Factors Affecting Failures. | 02 | 50 |
| 7. | • Facing Failures<br>- Failures are not Always Bad. | 02 | |
| 8. | • Facing Failures<br>- Insignificance of Failures. | 02 | |
| 9. | • Facing Failures<br>- Failures can be Overcome. | 02 | |

| | | | |
|---|---|---|---|
| 10. | • Learning from Legends<br>- Yogiji Maharaj and Nelson Mandela. | 02 | |

**Course Evaluation:**

**Theory:**

- Continuous Evaluation consists of 40 marks. There will be a mid-term exam which will assess the current progress of students, it assessed out of 20 marks and will be equivalent to 20 marks of the Continuous Course Evaluation (CCE). There will be a submission consisting 10 marks as per the guidelines of course coordinator and average of the attendance consisting 10 marks (minimum 60 percentage attendance is required).
- End semester exam (ESE) part A 30 marks and part B 30 marks.

**Course Outcome(s)**

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

- have gained a greater sense of social responsibility
- have gained marketable hard and soft skills that would directly apply to their future careers
- have gained greater insight and ability to navigate their family, social, and professional relationships along with difficult situations which may arise in their life
- have a broader sense of self-confidence and a defined identity
- have greater value for living a moral and ethical life based on principles taught in the course

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

Course Code: SEIT2910
Course Name: Industrial Exposure
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

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

CE: Continuous Evaluation, ESE: End Semester Exam

**Objective(s) of the Course:**
To help learners to
- get exposed to the industrial spectrum.
- learn the mechanisms of industry/ workplace.
- be aware about work culture and policies of industries.

**Outline of the Course:**

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

**Course Evaluation:**

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

**Course Outcome(s):**
After completion of the course, the student will be able to
- get acquainted with the industrial scenario.
- be aware about his future prospects in the respective field.
- gain knowledge of work culture and industrial expectations.

**Report Writing Guidelines**

**A. Report Format:**

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

The title page of the project shall give the following information in the order listed:

- Full title of the project as approved by the Mentor;
- The full name of the student/Group of students with enrollment number;
- The qualification for which the project is submitted;
- The name of the institution to which the project is submitted;
- The month and year of submission.

2. Project Certification Form
   [The form should be duly filled signed by the supervisors.]
3. Acknowledgements
   [All persons (e.g. supervisor, technician, friends, and relatives) and organization/authorities who/which have helped in the preparation of the report shall be acknowledged.]
4. Table of Contents/Index with page numbering
5. List of Tables, Figures, Schemes
6. Summary/abstract of the report.
7. Introduction/Objectives of the identified problem
8. Data Analysis and Finding of Solution
9. Application of the identified solution
10. Future Scope of enhancement of the Project and Conclusion
11. "Learning during Project Work", i.e. "Experience of Journey during Project Duration"
12. References(must)
13. Bibliography
14. Annexures (if any)

**B. Guideline for Report Formatting:**

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

**P P Savani University**
**School of Engineering**

## Department of Science & Humanities

Course Code: SESH2051
Course Name: Mathematical Methods for Computation
Prerequisite Course(s): Elementary Mathematics for Engineers (SESH1010)

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 00 | 02 | 05 | 40 | 60 | 00 | 00 | 50 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- recall existing knowledge of calculus and apply it for solving engineering problems involving differential equations.
- introduce partial differential equations with different methods of solution.
- use Laplace transform methods to solve differential equations.
- 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**<br>First order ODEs, Formation of differential equations, Solution of differential equation, Solution of equations in separable form, Exact first order ODEs, Linear first order ODEs, Bernoulli Equation, ODEs of Second and Higher order, Homogeneous linear ODEs, Linear Dependence and Independence of Solutions, Homogeneous linear ODEs with constant coefficients, Differential Operators Nonhomogeneous ODEs, Undetermined Coefficients, Variation of Parameters. | 10 | 20 |
| 2. | **Partial Differential Equation**<br>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. | 7 | 18 |

| | | | |
|---|---|---|---|
| 3. | **Laplace Transform**<br>Laplace Transform, Linearity, First Shifting Theorem, Existence Theorem, Transforms of Derivatives and Integrals, Unit Step Function, Second Shifting Theorem, Dirac's Delta function, Laplace Transformation of Periodic function, Inverse Laplace transform, Convolution. | 6 | 12 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Fourier Series & Fourier Integral**<br>Periodic function, Euler Formula, Arbitrary Period, Even and Odd function, Half-Range Expansions, Applications to ODEs, Representation by Fourier Integral, Fourier Cosine Integral, Fourier Sine Integral | 7 | 15 |
| 2. | **Basics of Statistics**<br>Elements, Variables, Observations, Quantitative and Qualitative data, Corss-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, Regression Analysis, Regression line and regression coefficient, Karl Pearson's method | 7 | 15 |
| 3. | **Probability Distribution**<br>Introduction, Conditional probability, Independent events, independent experiments, Theorem of total probability and Bayes' theorem, Probability distribution, Binomial distribution, Poisson distribution, Uniform distribution, Normal distribution. | 8 | 20 |

**List of Tutorials:**

| Sr No | Name of Tutorial | Hours |
|---|---|---|
| 1. | Ordinary Differential Equation-1 | 2 |
| 2. | Ordinary Differential Equation-2 | 2 |
| 3. | Ordinary Differential Equation-3 | 4 |
| 4. | Partial Differential Equation-1 | 2 |
| 5. | Partial Differential Equation-2 | 4 |
| 6. | Laplace Transform | 2 |
| 7. | Fourier Series-1 | 2 |
| 8. | Fourier Series-2 | 2 |
| 9. | Basics of Statistics-1 | 2 |
| 10. | Basics of Statistics-2 | 4 |
| 11. | Probability-1 | 2 |
| 12. | Probability-2 | 2 |

**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, 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.

**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 15 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/drawing/test of 15 marks during End Semester Exam.
- Viva/Oral performance of 10 marks during End Semester Exam.

**Course Outcome(s):**

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

- apply the respective 1st and 2nd order ODE and PDE.
- analyze engineering problems (growth, decay, flow, spring and series/parallel electronic circuits) using 1st and 2nd order ODE.
- classify differential equations and solve linear and non-linear partial differential equations.
- apply understanding of concepts, formulas, and problem-solving procedures to thoroughly investigate relevant real-world problems.
- select appropriate method to collect data and construct, compare, interpret and evaluate data by different statistical methods.
- apply concept of probability in decision making, artificial intelligence, machine learning etc.

**P P Savani University**
**School of Engineering**

**Department of Information Technology**

Course Code: SEIT2021
Course Name: Mobile Application Development
Prerequisite Course(s): Object Oriented Programming with Java (SEIT1030)

**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

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

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction of Android**<br>Android Operating System, History of Mobile Software Development, Open Handset Alliance (OHA), The Android Platform, Downloading and Installing Android Studio, Exploring Android SDK, Using the Command-Line Tools and the Android Emulator, Build the First Android application, Android Terminologies, Application Context, Application Tasks with Activities, Intents, and Closer Look at Android Activities. | 04 | 05 |
| 2. | **Android Application Design and Resource**<br>Anatomy of an Android Application, Android Manifest file, Editing the Android Manifest File, Managing Application's Identity, Enforcing Application System Requirements, Registering Activities and other Application Components, Working with Permissions. | 03 | 05 |
| 3. | **Exploring User Interface Screen Elements**<br>Introducing Android Views and Layouts, Displaying Text with TextView, Retrieving Data From Users, Using Buttons, Check Boxes and Radio Groups, Getting Dates and Times from Users, Using Indicators to Display and Data to Users, Adjusting Progress with SeekBar, Providing Users with Options and | 08 | 15 |

| | | | |
|---|---|---|---|
| | Context Menus, Handling User Events, Working with Dialogs, Working with Styles, Working with Themes. | | |
| 5. | **Designing User Interfaces with Layouts**<br>Creating User Interfaces in Android, View versus View Group, Using Built-In Layout Classes such as Fame Layout, Linear Layout, Relative Layout, Table Layout, Multiple Layouts on a Screen, Data-Driven Containers, Organizing Screens with Tabs, Adding Scrolling Support. | 05 | 15 |
| 6. | **Drawing and Working with Animation**<br>Working with Canvases and Paints, Working with Text, Working with Bitmaps, Working with Shapes, Working with Animation. | 03 | 10 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Android Storage APIs**<br>Working with Application Preferences such as Creating Private and Shared Preferences, Adding, Updating, and Deleting Preferences. Working with Files and Directories, Storing SQLite Database such as Creating an SQLite Database, Creating, Updating, and Deleting Database Records, Closing and Deleting a SQLite Database. | 07 | 15 |
| 2. | **Content Providers**<br>Exploring Android's Content Providers, Modifying Content Providers Data, Enhancing Applications using Content Providers, Acting as a Content Provider, Working with Live Folders. | 04 | 10 |
| 3. | **Networking APIs**<br>Understanding Mobile Networking Fundamentals, Accessing the Internet (HTTP).<br>**Android Web APIs**<br>Browsing the Web with WebView, Building Web Extensions using WebKit, Working with Flash.<br>**Multimedia APIs**<br>Working with Multimedia, Working with Still Images, Working with Video, Working with Audio. | 07 | 15 |
| 4. | **Telephony APIs:** Working with Telephony Utilities, Using SMS, Making and Receiving Phone Calls.<br>**Working with Notifications**: Notifying a User, Notifying with Status Bar, Vibrating the Phone, Blinking the Lights, Making Noise, Customizing the Notification, Designing Useful Notification. | 04 | 10 |

**List of Practical:**

| Sr No | Name of Practical | Hours |
|---|---|---|
| 1. | Create Hello World Application. | 2 |
| 2. | Create login application where you will have to validate Email ID and Password. | 2 |
| 3. | Create an application that will display toast (Message) on specific interval of Time. | 2 |
| 4. | 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. | 4 |
| 5. | Create an application that will change color of the screen, based on selected options from the menu. | 4 |
| 6. | Create an application UI component:<br>ImageButton, Togglebutton, ProgressBar, | 4 |
| 7. | Create an application UI component:<br>Spinner, DatePicker, TimePicker, SeekBar | 4 |
| 8. | Create an application UI component:<br>Switch, RatingBar | 4 |
| 9. | Using content providers and permissions, Read phonebook contacts using content providers and display in list. | 4 |
| 10. | Create an app to send SMS and email | 4 |
| 11. | Database Connectivity | 4 |
| 12. | Create an application to make Insert, Update, Delete and Retrieve operation on the database. | 6 |
| 13. | Create an application that will play a media file from the memory card. | 4 |
| 14. | Create application using Google speech API | 6 |
| 15. | Create application using Google maps API | 6 |

**Text Book(s):**

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

**Reference Book(s):**

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

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

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

**Practical:**

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

**Course Outcome(s):**

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

- understand the differences between Android and other mobile development environments.
- learn how Android applications work, their life cycle, manifest, intents, and using external resources.
- design and develop useful Android applications with compelling user interfaces by using, extending, and creating your own layouts and views and using menus, data storage and other APIs.

**P P Savani University**
**School of Engineering**

**Department of Information Technology**

Course Code: SEIT2031
Course Name: Operating System
Prerequisite Course(s): Programming for Problem Solving (SECE1050)

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 02 | 00 | 04 | 40 | 60 | 20 | 30 | 00 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction**<br>What is OS? History of OS, Types of OS, Concepts of OS. | 02 | 06 |
| 2. | **Processes and Threads Management**<br>Process Concept, process state, process control block, CPU Scheduling: CPU-I/O burst cycle, types of schedulers, context switch, Preemptive Scheduling, Dispatcher, Scheduling criteria; Scheduling algorithms: FCFS, SJF, Priority scheduling, Round-Robin scheduling, Multilevel queue scheduling; Threads, Types of Threads, Multithreading | 10 | 20 |
| 3. | **Inter Process Communication**<br>Race Conditions, Critical Regions, Mutual exclusion with busy waiting, sleep and wakeup, semaphores, mutexes, monitors, message passing, barriers; Classical IPC Problems: The dining philosopher problem, The readers and writers problem. | 06 | 14 |
| 4. | **Deadlocks:**<br>Resources, Conditions for Deadlocks, Deadlock modelling, The ostrich algorithm, Deadlock detection and recovery, Deadlock avoidance, Deadlock prevention, Other issues: Two-phase locking, Communication deadlocks, live locks, starvation. | 04 | 10 |

| Section II | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Memory Management**<br>Main memory: Background, Swapping, Contiguous memory allocation, Segmentation, Paging, Structure of page table, Virtual memory: Background, Demand paging, copy-on write, Page Replacement Algorithms: Optimal page replacement, not recently used, FIFO, second chance page replacement, LRU; Allocation of frames, Thrashing. | 12 | 25 |
| 2. | **File Management**<br>Introduction; Files: naming, structure, types, access, attributes, operations; Directories: single level, hierarchical, path names, directory operations; File Allocation Methods: Contiguous Allocation, Linked Allocation, Indexed Allocation | 06 | 13 |
| 3. | **Disk Management**<br>Disk structure, Disk arm Scheduling Algorithms: FCFS, SSTF, SCAN, C-SCAN, LOOK, C-LOOK,; Disk Free Space Management, RAID | 05 | 12 |

**List of Practical:**

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

**Text Book(s):**

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

**Reference Book(s):**

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

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

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

**Practical:**

- Continuous Evaluation consists of performance of practical, which will be evaluated out of 10 per each practical. At the end of the semester, average of the entire practical will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 15 marks during End Semester Exam.
- Viva/Oral performance consists of 15 Marks during End Semester Exam.

**Course Outcome(s):**

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

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

**P P Savani University**
**School of Engineering**

## Department of Computer Engineering

Course Code: SECE2040
Course Name: Computer Organization
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 02 | 00 | 04 | 40 | 60 | 20 | 30 | 00 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- 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**<br>Instruction codes, Computer registers, computer instructions Timing and Control, Instruction cycle Memory-Reference Instructions, Input-output and interrupt, Complete computer description, Design of Basic computer, Design of Accumulator Unit. | 06 | 15 |
| 2. | **Programming the Basic Computer**<br>Introduction Machine Language, Assembly Language<br>The Assembler, Program loops, Programming Arithmetic and logic operations, subroutines, I-O Programming. | 05 | 08 |
| 3. | **Computer Arithmetic**<br>Introduction, Addition and subtraction, Multiplication and Division Algorithms, Floating Point Arithmetic. | 06 | 12 |
| 4. | **Central Processing Unit**<br>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 % |
| 1. | **Pipeline and Vector Processing**<br>Flynn's taxonomy, Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction, Pipeline, RISC Pipeline, Vector Processing, Array Processors. | 08 | 20 |
| 2. | **Input-Output Organization**<br>Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA, Input-Output Processor (IOP), CPUIOP Communication, Serial communication. | 06 | 15 |
| 3. | **Memory Organization**<br>Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory. | 08 | 15 |

**List of Practical:**

| Sr No | Name of Practical | Hours |
|---|---|---|
| 1. | Study basics of Computer Organization | 04 |
| 2. | Study and implement programs on number system | 08 |
| 3. | Study and implement programs on conversion and | 04 |
| 4. | Study and build different circuits using Logisim. | 14 |

**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, 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 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 10 marks.
- Practical performance/quiz/test consists of 15 marks during End Semester Exam.
- Viva/Oral performance consists of 15 marks during End Semester Exam.

**Course Outcome(s):**

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

- identify and provide solutions for real-world control problems.
- learn to assemble various computer hardware and middleware.

**P P Savani University**
**School of Engineering**

## Department of Computer Engineering

Course Code: SECE2051
Course Name: Computer Graphics & Multimedia
Prerequisite Course(s): Programming for Problem Solving (SECE1050)

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 02 | 00 | 04 | 40 | 60 | 20 | 30 | 00 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

**Objective(s) of the Course:**
To help the learners to
- understand concepts of computer graphics & multimedia.
- learn basics of graphics and rendering algorithms in 2D and 3D.
- analyze and understand various aspects of computer vision technologies.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction to Graphics**<br>Basic of Computer Graphics, Applications of computer graphics, Display devices, Random and Raster scan systems, Graphics input devices, Graphics software and standards | 07 | 10 |
| 2. | **Graphics Primitives**<br>Points, lines, circles and ellipses as primitives, scan conversion algorithms for primitives, Fill area primitives including scan-line polygon filling, inside-outside test, boundary and flood-fill, character generation, line attributes, area-fill attributes, character attributers. | 08 | 20 |
| 3. | **2D Transformation and Viewing**<br>Transformations (translation, rotation, scaling), matrix representation, homogeneous coordinates, composite transformations, reflection and shearing, viewing pipeline and coordinates system, window-to-viewport transformation, clipping including point clipping, line clipping (cohen-sutherland, liang- bersky , NLN), polygon clipping | 08 | 20 |

| Section II | | | |
|---|---|---|---|
| Module | Content | Hours | Weightage in % |
| 1. | **3D Concepts and Object Representation**<br>3D display methods, polygon surfaces, tables, equations, meshes, curved lies and surfaces, quadric surfaces, spline representation, cubic spline interpolation methods, Bazier curves and surfaces, B-spline curves and surfaces | 08 | 20 |
| 2. | **3D transformation and Viewing**<br>3D scaling, rotation and translation, composite transformation, viewing pipeline and coordinates, parallel and perspective transformation, view volume and general (parallel and perspective) projection transformations | 06 | 10 |
| 3. | **Surface Detection**<br>Visible surface detection concepts, back-face detection, depth buffer method, illumination, light sources, illumination methods (ambient, diffuse reflection, specular reflection), Color models: properties of light, XYZ, RGB, YIQ and CMY color model | 06 | 15 |
| 4. | **Multimedia**<br>Characteristics of a multimedia presentation, Uses of Multimedia, Text –Types, Unicode Standard, text Compression, Text file formats, Audio Components of an audio system, Digital Audio, Digital Audio processing, Sound cards, Audio file formats, Audio Processing software, Video-Video color spaces, Digital Video, Digital Video processing, Video file formats. | 02 | 05 |

**List of Practical:**

| Sr No. | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction to computer graphics and multimedia tools. | 02 |
| 2. | To study the various graphics functions in C language. | 02 |
| 3. | Develop the DDA Line drawing algorithm using C language. | 02 |
| 4. | Develop the Bresenham's Line drawing algorithm using C language. | 04 |
| 5. | Develop the Bresenham's Circle drawing algorithm using C language. | 04 |
| 6. | Develop the C program for to display different types of lines. | 04 |
| 7. | Perform the following 2D transformation operation Translation, Rotation and Scaling. | 02 |
| 8. | Perform the Line Clipping Algorithm. | 02 |
| 9. | Perform the Polygon clipping algorithm. | 02 |
| 10. | Perform the basic transformations such as Translation, Scaling, Rotation for a given 3D object. | 02 |
| 11. | Design and development of a mini project in the area of computer graphics and multimedia. (It will include animation in 2D, 3D and various shapes.) | 04 |

**Text Book(s):**

| Title | Author(s) | Publication |
|---|---|---|
| Computer Graphics – C Version | D. Hearn, P. Baker | Pearson Education |

**Reference Book(s):**

| Title | Author(s) | Publication |
|---|---|---|
| Computer Graphics | Foley, van Dam | Pearson Education |
| Computer Graphics | Sinha, Udai | TMH |
| Computer Graphics with OpenGL | Hearn, Baker | Pearson |

**Web Material Link(s):**

- https://nptel.ac.in/courses/106106090/

**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 should be evaluated out of 10 marks per each practical. At the end of the semester, average of the entire practical will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 10 marks during End Semester Exam.
- Viva/oral performance consists of 20 marks during End Semester Exam.

**Course Outcome(s):**

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

- learn basics of graphics and rendering algorithms in 2D and 3D.
- analyze and implement various computer vision technology-based applications.
- design and develop various computer graphics & multimedia-based applications.

**P P Savani University**
**School of Engineering**

**Center for Language studies**

Course Code: CFLS3010
Course Name: Foreign Language - 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 | |
| 02 | 00 | 00 | 00 | 40 | 60 | 00 | 00 | 00 | 00 | 100 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- develop and integrate the use of the four Language skills i.e. listening, speaking, reading and Writing.
- use the language effectively and appropriately on topics of everyday life situations.
- develop an interest in the appreciation of French.
- develop an intercultural awareness.
- enhance the ability of the candidates to express their ideas and feelings in their own words and for
- to understand the use of correct language.
- appreciate the language as an effective means of communication.
- understand language when spoken at normal conversational speed in everyday life situations.
- understand the basic structural patterns of the language, vocabulary and constructions.

**Course Content:**

| **Section I- Theory** | | | |
|---|---|---|---|
| Module | Content | Hours | Weightage |
| 1. | Introduction to French<br>• Alphabets<br>• French accents<br>• Greetings<br>• What are the similarities and differences between English and French?<br>Numbers in French<br>• Cardinal numbers<br>Ordinal numbers<br>Vocabulary part-1<br>• The days of the week<br>• The months of the year<br>• Seasons | 3 | 10% |

| | | | |
|---|---|---|---|
| | • Directions | | |
| 2. | Vocabulary part-2<br>• Family<br>• Colours<br>• Day/time indicators<br>• Body parts<br>• Clothing<br>• School subjects<br>• Places<br>• Common expressions | 3 | 10% |
| 3. | French grammar<br>And verbs:<br>• Verb etre(to be)<br>Verb avoir(to have) | 3 | 30% |
| 4. | Regular verbs<br>First group verbs('ER' group)<br>Regular verbs<br>Second group verbs('IR' group)<br>Irregular verbs<br>• Third group verbs<br>• du ,de l',de la./au,aux(article contactive and paritive.)<br>possessive prorouns(mon,ma,mes..etc) | 12 | 50% |
| 5. | • Telling time in French<br>• Basic introduction | 3 | |
| **Section I- Practical** | | | |
| Module | Content(delf book) | hours | Weightage |
| 1. | • Reading | 1 | 10% |
| 2. | • Writing | 1 | 10% |
| 3. | • Speaking | 2 | 10% |
| 4. | • Listening | 1 | 10% |
| 5. | Role palys | 1 | 15% |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Namaste German | Yoshita Dalal | Yoshita Dalal |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Fit In Deutsch | Hueber | Goyal Publication |

**Web Material Link(s):**

- https://www.youtube.com/watch?v=iGovllrEsF8&list=PLRps6yTcWQbpoqIOCmqMeI1HLnLIRmO_t
- https://www.youtube.com/watch?v=GwBfUzPCiaw&list=PL5QyCnFPRx0GxaFjdAVkx7K9TfEklY4sg

**Course Evaluation:**

**Theory:**

- Continuous Evaluation consists of a test of 30 marks and 1 hour of duration.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination consists of 60 marks exam.

**Course Outcome(s):**

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

- demonstrate the level of proficiency necessary to enable them to function in an environment where French is used exclusively.
- demonstrate speaking, listening, reading, and writing in French.
- Delf exam certification will be valid throughout the world.

## Integrated Personality Development Course

Course Code: SEPD3050
Course Name: IPDC-2

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 02 | 00 | 00 | 01 | 40 | 60 | 00 | 00 | -- | -- | 100 |

CE: Continuous Evaluation, ESE: End Semester Exam

**Objective(s) of the Course:**

To help learners to

- provide students with a holistic education – focused on increasing their intelligence quotient, physical quotient, emotional quotient and spiritual quotient.
- provide students with hard and soft skills, making them more marketable when entering the workforce.
- educate students on their social responsibilities as citizens of India
- provide students with a value-based education which will enable them to be successful in their family, professional, and social relationships.
- teach self-analysis and self-improvement exercises to enhance the potential of the participants.

**Course Content:**

| Lecture No. | Content | Hours |
|---|---|---|
| 1. | Remaking Yourself<br>Restructuring Yourself. | 02 |
| 2. | Essentials of Profession<br>Writing a Resume | 02 |
| 3. | Financial Wisdom<br>Basics of Financial Planning. | 02 |
| 4. | Financial Wisdom<br>Financial Planning Process. | 02 |
| 5. | From House to Home<br>Listening & Understanding. | 02 |
| 6. | From House to Home<br>Forgive & Forget. | 02 |
| 7. | From House to Home<br>Bonding the Family. | 02 |
| 8. | Soft Skills<br>Networking, Decision making & Leadership | 02 |

| | | |
|---|---|---|
| 9. | Soft Skills<br>Teamwork, Harmony & Adaptability. | 02 |
| 10. | Mass Management<br>Project Management. | 02 |
| 11. | My India My Pride<br>Glorious Past (Part -1) | 02 |
| 12. | My India My Pride<br>Glorious Past (Part -2) | 02 |
| 13. | My India My Pride<br>Present Scenario. | 02 |
| 14. | My India My Pride<br>An Ideal Citizen-1 | 02 |
| 15. | My India My Pride<br>An Ideal Citizen-2 | 02 |

**Course Evaluation:**
**Theory:**

- Continuous Evaluation consists of 40 marks. There will be a mid-term exam which will assess the current progress of students, it assessed out of 20 marks and will be equivalent to 20 marks of the Continuous Course Evaluation (CE). There will be a submission consisting 10 marks as per the guidelines of course coordinator and average of the attendance consisting 10 marks (minimum 60 percentage attendance is required).
- End semester exam (ESE) section I (30 marks) and section II (30 marks).

**Course Outcome(s):**

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

- have gained a greater sense of social responsibility.
- have gained marketable hard and soft skills that would directly apply to their future careers.
- have gained greater insight and ability to navigate their family, social, and professional relationships along with difficult situations which may arise in their life.
- have a broader sense of self-confidence and a defined identity.
- have greater value for living a moral and ethical life based on principles taught in the course.

# THIRD YEAR B. TECH.

| P P SAVANI UNIVERSITY | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SCHOOL OF ENGINEERING** | | | | | | | | | | | | | | | |
| **TEACHING & EXAMINATION SCHEME FOR B. TECH. INFORMATION TECHNOLOGY PROGRAMME AY: 2019-20** | | | | | | | | | | | | | | | |
| **Sem** | **Course Code** | **Course Title** | **Offered By** | **Teaching Scheme** | | | | | **Examination Scheme** | | | | | | |
| | | | | **Contact Hours** | | | | **Credit** | **Theory** | | **Practical** | | **Tutorial** | | **Total** |
| | | | | **Theory** | **Practical** | **Tutorial** | **Total** | | **CE** | **ESE** | **CE** | **ESE** | **CE** | **ESE** | |
| 5 | SEIT3010 | Software Engineering | IT | 3 | 0 | 1 | 4 | 4 | 40 | 60 | 0 | 0 | 50 | 0 | 150 |
| | SEIT3022 | Embedded Systems | IT | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SEIT3032 | Design & Analysis of Algorithms | IT | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SECE3011 | Computer Networks | CE | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SEPD3010 | Professional Communication & Soft Skills | SEPD | 1 | 2 | 0 | 3 | 2 | 0 | 0 | 50 | 50 | 0 | 0 | 100 |
| | CFLS3021 | Foreign Language- II | CFLS | 2 | | | 2 | 0 | 40 | 60 | 0 | 0 | 0 | 0 | 100 |
| | SEIT3920 | Summer Training | IT | 2 | | | 0 | 2 | 0 | 0 | 100 | 0 | 0 | 0 | 100 |
| | | **Elective-I** | | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | | | | | | **Total** | **28** | **23** | | | | | | | **1050** |
| 6 | SEIT3041 | Web Technology | IT | 2 | 4 | 0 | 6 | 4 | 40 | 60 | 40 | 60 | 0 | 0 | 200 |
| | SEIT3062 | Cryptography & Network Security | IT | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SEIT3071 | Advance Java Technology | IT | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SECE3031 | Data Warehouse & Data Mining | CE | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SEPD3020 | Corporate Grooming & Etiquette | SEPD | 1 | 2 | 0 | 3 | 2 | 0 | 0 | 50 | 50 | 0 | 0 | 100 |
| | SEIT3910 | Minor Project | IT | 4 | | | 4 | 4 | 0 | 0 | 100 | 100 | 0 | 0 | 200 |
| | CFLS3032 | Foreign Language- III | CFLS | 2 | | | 2 | 0 | 40 | 60 | 0 | 0 | 0 | 0 | 100 |
| | | **Elective-II** | | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | **Total** | **34** | **27** | | **1200** |

**Teaching Scheme**
**Elective Subjects**

| Offered in Sem. | Course Code | Course Name | Offered By | Teaching Scheme | | | | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Contact Hours | | | | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | Theory | Practical | Tutorial | Total | | CE | ESE | CE | ESE | CE | ESE | |
| 5 | SECE3511 | Programming with .Net | CE | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SEIT3510 | System Analysis and Design | IT | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 50 | 00 | 0 | 0 | 150 |
| | SECE3520 | Service Oriented Architecture | CE | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| 6 | SECE3531 | Wireless Network & Mobile Computing | CE | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SECE3541 | Software Testing & Quality Assurance | CE | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SEIT3531 | Image Processing | IT | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |

**P P Savani University**
**School of Engineering**

**Department of Information Technology**

Course Code: SEIT3010
Course Name: Software Engineering
Prerequisite Course(s): Basics of Object-Oriented Programming and UML

**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 | 0 | 0 | 20 | 30 | 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**<br>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**<br>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**<br>Design Concepts, Design Model, Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design, Alternative architectural designs, Modeling Component level design and its modeling, Procedural Design, Object Oriented Design. | 05 | 05 |
| 4. | **User Interface Design**<br>Concepts of UI, Interface Design Model, Internal and External Design, Evaluation, Interaction, and Information Display Software. | 02 | 05 |
| 5. | **Planning a Software Project**<br>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**<br>Quality Control, Assurance, Cost, Reviews, Software Quality Assurance, Approaches to SQA, Reliability, Quality Standards-ISO9000 and 9001. | 04 | 10 |
| 2. | **Coding and Unit Testing**<br>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**<br>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**<br>Management Spectrum, People –Product – Process- Project, W5HH Principle, Importance of Team Management. | 02 | 05 |
| 5. | **Case Tools and Study**<br>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/

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**Course Evaluation:**

**Theory:**

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

**Practical:**

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

**Course Outcome(s):**

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

- 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.

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

Course Code: SEIT3022
Course Name: Embedded Systems
Prerequisite Course(s): Digital Workshop (SECE2021) and Computer Organization (SECE2040)

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 02 | 00 | 04 | 40 | 60 | 20 | 30 | 00 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Computer architecture and the 8051 Microcontroller.**<br>• Computer organization and architecture<br>• The difference between microprocessor and microcontroller<br>• The MCS51 Microcontroller family<br>• The 8051 microcontroller Hardware Structure<br>• Edsim51 software installation and familiarizing | 05 | 10 |
| 2. | **Type of Memory of the 8051 Microcontroller.**<br>• Code Memory, Internal and external RAM and ROM<br>• Special Function Registers (SFRs) & Bit Memory<br>• Basic Registers (ACC, Rn, PC, SP and DPTR) | 05 | 10 |
| 3. | **Timers and I/O Programming:**<br>• Working of 8051<br>• TMOD SFRs and TCONSFRs<br>• Initializing and Reading of Timer | 04 | 08 |
| 4. | **Arithmetic and Logic Instruction**<br>• Arithmetic Instruction (ADD, ADDC, DA, SUBB, MUL, DIV)<br>• Logic and Compare Instruction<br>• Rotate Instruction and Data serialization<br>• BCD | 04 | 10 |

| | | | |
|---|---|---|---|
| 5. | **Interfacing of 8051 microcontroller:**<br>• Interfacing into7-Segments;<br>• Interfacing into 4x3 Keypad;<br>• Interfacing into LCD<br>• Interfacing into sensors, ADC and DAC<br>• Interfacing into external memory RAM and ROM | 04 | 12 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Arduino Microcontroller Board**<br>• Introducing the Arduino Board<br>• Installing and familiarizing the Arduino IDE<br>• Project Development with Arduino Uno | 08 | 15 |
| 2. | **Interfacing the Arduino Uno into Keypad and 7-Segment**<br>• Connection Diagram<br>• Arduino Program Code | 05 | 11 |
| 3. | **Interfacing the Arduino Uno into Keypad and LCD:**<br>• Connection Diagram<br>• Arduino Program Code | 05 | 12 |
| 4. | **Interfacing the Arduino Uno into Sensor, and DC-Motor**<br>• Connection Diagram<br>• Arduino Program Code | 05 | 12 |

**List of Practical:**

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

**Text Book(s):**

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

**Reference Book(s):**

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

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

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

**Practical:**

- Continuous Evaluation consists of the performance of practical, which will be evaluated out of 10 marks per each practical and the average of the entire practical will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 15 marks.
- External viva consists of 15 marks.

**Course Outcome(s):**

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

- analyse the digital logic circuit containing combinatorial and sequential logic system.
- distinguish between microprocessor and microcontroller.
- design an embedded system using a microcontroller.

**P P Savani University**
**School of Engineering**

**Department of Information Technology**

Course Code: SEIT3032
Course Name: Design and Analysis of Algorithms
Prerequisite Course(s): Programming for Problem Solving (SECE1050), and Data Structures (SECE2031)

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 02 | 00 | 04 | 40 | 60 | 20 | 30 | 00 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

**Objective(s) of the Course:**
To help learners to
- develop logic building and problem-solving skills.
- understand how to calculate time complexity and space complexity of any algorithm.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in% |
| 1. | **Fundamental concept of Algorithm Design & Analysis**<br>Algorithm: characteristics, specifications, Writing Pseudo-Code, Frequency count and its importance in analysis of an algorithm, Asymptotic Notations: Time complexity & Space complexity of an algorithm, Big 'O'& 'Ω' notations, Best, Worst and Average case analysis of an algorithm, Analysis of searching algorithms: sequential, binary search,<br>Analysis of sorting methods: bubble, insertion, selection, heap sort, Analysis of each sorting technique for best, worst and average case, Concept of Internal & External sorting. | 06 | 15 |
| 2. | **Divide and Conquer Algorithmic Design Method**<br>Divide and conquer: basic algorithm and characteristics, Binary Search: method and analysis of binary search for best, worst and average case for searches, Quick Sort, Merge Sort: method and analysis of algorithms, Finding the largest and smallest number in a list, Matrix Multiplication. | 06 | 15 |
| 3. | **Greedy Method**<br>The Greedy Method: basic algorithm and characteristics, Fractional Knapsack Problem solving using greedy method, Optimal merge patterns and optimal storage on tapes, Job | 06 | 10 |

| | | | |
|---|---|---|---|
| | sequencing with deadlines, Huffman Coding: greedy method, Minimum cost spanning trees: Prim's and Kruskal's Algorithm, Single source shortest path. | | |
| 4. | **Dynamic Programming Method**<br>Dynamic Programming Method: basic algorithm and characteristics, 0/1 Knapsack Problem solving using DP method, Multistage graphs, Optimal binary search trees, Travelling salesperson problem. | 05 | 10 |
| | **Section II** | | |
| Module No. | Content | Hours | Weightage in% |
| 1. | **Backtracking Method**<br>Backtracking Method: basic algorithm and characteristics, Solving n-queens problem, Sum of subsets problem, Graph coloring, Hamiltonian cycle (TSP). | 06 | 15 |
| 2. | **Branch and Bound technique**<br>Branch and bound: basic algorithm and characteristics, solving n-queens using branch & bound, FIFO Branch and Bound & Least Cost Branch & Bound, Least Cost Search, 15-puzzle, Solving Travelling salesperson problem using branch & bound. | 08 | 15 |
| 3. | **String Matching**<br>Introduction, The naive string-matching algorithm, The Rabin-Karp algorithm, String Matching with finite automata, The Knuth-Morris-Pratt algorithm. | 04 | 12 |
| 4. | **Introduction to NP-Completeness**<br>The class P and NP, Polynomial reduction, NP- Completeness Problem, NP-Hard Problems. Travelling Salesman problem, Hamiltonian problem, Approximation algorithms. | 04 | 08 |

**List of Practical:**

| Sr No | Name of Practical: | Hours |
|---|---|---|
| 1. | Implementation and Time analysis of Bubble sort. | 02 |
| 2. | Implementation and Time analysis of Selection sort. | 02 |
| 3. | Implementation and Time analysis of Insertion sort. | 02 |
| 4. | Implementation and Time analysis of Merge sort. | 02 |
| 5. | Implementation and Time analysis of Quick sort. | 02 |
| 6. | Implementation and Time analysis of searching algorithm. | 04 |
| 7. | Implementation of a dynamic programming. | 04 |
| 8. | Implementation of shortest path algorithm. | 02 |
| 9. | Implementation of graph traversal technique. | 02 |
| 10. | Implementation of Minimum Cost Spanning Tree. | 02 |
| 11. | Implementation of backtracking. | 02 |
| 12. | Implementation of Rabin-Karp algorithm. | 02 |
| 13. | Implementation of greedy algorithm. | 02 |

**Text Book:**

| Title | Author/s | Publication |
|---|---|---|
| Fundamentals of Computer Algorithms | Ellis Horowitz, Sarataj Sahni, S.Rajasekaran | Universities Press |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Introduction to Algorithms | Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein | PHI Learning |
| Algorithm Design | Michael Goodrich, Roberto Tamassia. | Wiley Student Edition |

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

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

**Practical:**

- Continuous Evaluation consists of performance of practical, which will be evaluated out of 10 marks per each practical and average of the entire practical will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance consists of 15 marks during End Semester Exam.
- External viva consists of 15 marks in End Semester Exam.

**Course Outcome(s):**

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

- analyze and design algorithms and to appreciate the impact of algorithm design in practice.
- understand how the worst-case time complexity of an algorithm is computed.
- understand how asymptotic notation is used to provide a rough classification of algorithms.
- design time and space efficient algorithms using different techniques.

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

Course Code: SECE3011
Course Name: Computer Networks
Prerequisite Course(s): Operating System (SEIT2031)

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 02 | 00 | 04 | 40 | 60 | 20 | 30 | 00 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand the concept of data communication.
- understand the concepts and layers of OSI and TCP-IP reference models.
- get familiar with different protocols and network components.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction**<br>Overview of network and data communication, Data Communications, Computer Networking, Protocols and Standards, types of Network, Network Topology, Protocol hierarchies, and design issues of layers, Interfaces, and services. Reference Model: The OSI reference model, TCP/IP reference model, network standards. | 04 | 10 |
| 2. | **Physical Layer**<br>Data and transmission techniques, Multiplexing, Transmission media, Asynchronous Communication, Wireless transmission, ISDN, ATM, Cellular Radio, Switching techniques issues. | 07 | 15 |
| 3. | **Data Link Layer**<br>Layer design issues, services provided to network layers, Framing, Error control, and Flow control, Data link control and protocols – Simplex protocol, Sliding window protocol | 07 | 15 |
| 4. | **Medium Access Sub Layer**<br>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 % |
| 1. | **Network Layer**<br>A network Layer design issue, Routing algorithms, and protocols, Congestion Control Algorithms, Internetworking, Addressing, N/W Layer Protocols and recent developments. | 08 | 20 |
| 2. | **Transport Layer**<br>Transport services, Design issues, transport layer protocols, Congestion Control, QOS and its improvement. | 06 | 15 |
| 3. | **Application Layer**<br>Client-Server Model, DNS, SMTP, FTP, HTTP, WWW, and recent development | 08 | 15 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | Implement Packet Generation having information of packet number (2-dig), Total no of packets (2 dig), & data itself in the packet. | 08 |
| 2. | Implementation flow control algorithms, CRC, VRC, LRC | 06 |
| 3. | Implement CSMA/CD between two machines | 06 |
| 4. | Implement Token ring between 3 machines. | 06 |
| 5. | Study of switches, Hubs, Routers, and gateway. | 04 |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Data Communication and Networking | Behrouz A. Forouzan | Tata McGraw Hill |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Computer Networks | Andrew S Tanenbaum | PHI Learning |
| Data and Computer Communications | William Stallings | Prentice Hall |
| TCP/IP Illustrated Volume-I | Kevin R. Fall, W. Richard Stevens | Addition Wesley |
| Internetworking with TCP/IP Volume-I | Douglas E. Comer | PHI |

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

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

**Practical:**

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

**Course Outcome(s):**

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

- be familiar with the basics of data communication.
- be familiar with various types of computer networks.
- understand the concepts of protocols, network interfaces, and performance issues in networks.
- have experience in network tools and network programming.

**P P Savani University**
**School of Engineering**

**Centre for Skill Enhancement & Professional Development**

Course Code: SEPD3010
Course Name: Professional Communication & Soft Skills
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 1 | 2 | 0 | 2 | 0 | 0 | 50 | 50 | 0 | 0 | 100 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand the multifaceted professional speaking process.
- learn the writing etiquettes for professional purposes
- gain basic knowledge, skills and the right attitude to succeed in the future professional working environment.
- develop confidence, enhance their professional communication ability in civilized, harmonized manner.
- sharpen communication skills with reference to organizational structure
- expose themselves to the modern modes of communication

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Self-Management & Career Building**<br>• Self-Evaluation, discipline, and criticism<br>• SWOT analysis to identify personal strength/ weakness<br>• Planning & Goal Setting<br>• MBTI test for self-analysis<br>• Profiling on Online Platforms | 01 | 07 |
| 2. | **Interpersonal Organizational Communication**<br>• Interpersonal Behavioral Skills<br>• Understanding empathy and comprehend other's opinions/ points of views, Managing Positive and negative emotions<br>• Healthy and Unhealthy expression of emotions.<br>• Mutuality, Trust, Emotional Bonding and handling situation in interpersonal relationship | 04 | 25 |

| | | | |
|---|---|---|---|
| 3. | **Professional Communication (Speaking) - I**<br>• Professional Communication and Rhetorics<br>• Art of Telephonic Conversation<br>• Public Speaking | 03 | 18 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Professional Communication (Speaking) – II**<br>• Group Discussion (Concept, importance, Methods, Dos and Don'ts, Paralinguistic and Nonverbal Etiquettes)<br>• Personal Interview (Concept, Importance, Methods, Dos and Don'ts, Type, Paralinguistic and Nonverbal Etiquettes) | 03 | 20 |
| 2. | **Professional Communication (Writing)**<br>• Cover Letter and Resume Building<br>• Email writing<br>• Report Building<br>• Technical/ Academic Writing (Reference/ citation/ plagiarism) | 04 | 30 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | SWOT Analysis & Profiling | 04 |
| 2. | MBTI Test | 02 |
| 3. | Interpersonal Organizational Communication | 02 |
| 4. | Group Discussion | 04 |
| 5. | Personal Interview | 04 |
| 6. | Cover Letter and Resume | 06 |
| 7. | Email and Report Writing | 04 |
| 8. | Technical Academic Writing | 04 |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Professional Communication | Sheekha Shukla | 2010, WordPress |
| Professional Communication Skills | Rajesh Kariya | Paradise Publication, Jaipur |
| Soft Skills and Professional Communication | Petes S. J., Francis. | Tata McGraw-Hill Education, 2011 |
| Effective Communication and Soft Skills | Nitin Bhatnagar | Pearson Education India |
| Behavioural Science: Achieving Behavioural Excellence for Success | Dr. Abha Singh | John Wiley & Sons, 2012 |
| The Hard Truth about Soft Skills | Klaus, Peggy, Jane Rohman & Molly Hamaker | London: Harper Collins |

**Course Evaluation:**

**Practical:**

- Continuous Evaluation consists of 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 student will be able to

- understand the importance of self-analysis for career building.
- learn tactics of communication in professional/ organizational ambiance.
- master the art of conversation and public speaking
- expose themselves for placement processes
- develop writing etiquettes pertaining to placement and organizational context

**P P Savani University**
**School of Engineering**

## Center for Language Studies

Course Code: CFLS3021
Course Name: Foreign Language - II
Prerequisite Course(s): Foreign Language – I (CFLS3010)

**Teaching & Examination Scheme:**

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- develop and integrate the use of the four Language skills i.e. listening, speaking, reading and Writing.
- use the language effectively and appropriately on topics of everyday life situations.
- develop an interest in the appreciation of French.
- develop an intercultural awareness.
- enhance the ability of the candidates to express their ideas and feelings in their own words and for
- to understand the use of correct language.
- appreciate the language as an effective means of communication.
- understand language when spoken at normal conversational speed in everyday life situations.
- understand the basic structural patterns of the language, vocabulary and constructions.

**Course Content:**

| **Section I – Theory** | | | |
|---|---|---|---|
| **Unit** | Content | Hours | Weightage |
| 1. | French grammar INTRODUCTION TO TENSES<br>FUTUR PASSE COMPOSE<br>Verb etre(to be)<br>Verb avoir(to have) | 10 | 20% |
| 2. | Regular verbs IN FUTUR AND PASSE COMPOSE<br>First group verbs('ER' group) | 5 | 25% |
| 3. | Regular verbs IN FUTUR AND PASSE COMPOSE<br>Second group verbs('IR' group) | 5 | 25% |
| 4. | Irregular verbs IN FUTUR AND PASSE COMPOSE<br>Third group verbs<br>du ,de l',de la./au,aux(article contactive and paritive.)<br>possessive prorouns(mon,ma,mes..etc) | 10 | 30% |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Namaste German | Yoshita Dalal | Yoshita Dalal |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Fit In Deutsch | Hueber | Goyal Publication |

**Web Material Link(s):**

- https://www.youtube.com/watch?v=iGovllrEsF8&list=PLRps6yTcWQbpoqIOCmqMeI1HLnLIRmO_t
- https://www.youtube.com/watch?v=GwBfUzPCiaw&list=PL5QyCnFPRx0GxaFjdAVkx7K9TfEklY4sg

**Course Evaluation:**

**Theory:**

- Continuous Evaluation consists of a test of 30 marks and 1 hour of duration.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination consists of 60 marks exam.

**Course Outcome(s):**

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

- demonstrate the level of proficiency necessary to enable them to function in an environment where French is used exclusively.
- demonstrate speaking, listening, reading, and writing in French.
- Delf exam certification will be valid throughout the world.

**P P Savani University**
**School of Engineering**

**Department of Information Technology**

Course Code: SEIT3910
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 | |
| 00 | 00 | 00 | 02 | 00 | 00 | 100 | 00 | 00 | 00 | 100 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

**Outline of the Course:**

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

**Course Evaluation:**

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

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

- apply their theoretical knowledge into reality.
- learn to adapt the workplace situations when they will be recruited.
- be prepared for the real world situations in their future.

**Report Writing Guidelines**

**A. Report Format:**

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

The title page of the project shall give the following information in the order listed:

- Full title of the project as approved by the Mentor;
- The full name of the student/Group of students with enrollment number;
- The qualification for which the project is submitted;
- The name of the institution to which the project is submitted;
- The month and year of submission.

2. Project Certification Form
   [The form should be duly filled signed by the supervisors.]
3. Acknowledgements
   [All persons (e.g. supervisor, technician, friends, and relatives) and organization/authorities who/which have helped in the preparation of the report shall be acknowledged.]
4. Table of Contents/Index with page numbering
5. List of Tables, Figures, Schemes
6. Summary/abstract of the report.
7. Introduction/Objectives of the identified problem
8. Data Analysis and Finding of Solution
9. Application of the identified solution
10. Future Scope of enhancement of the Project and Conclusion
11. "Learning during Project Work", i.e. "Experience of Journey during Project Duration"
12. References(must)
13. Bibliography
14. Annexures (if any)

**B. Guideline for Report Formatting:**

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

**P P Savani University**
**School of Engineering**

**Department of Information Technology**

Course Code: SEIT3041
Course Name: Web Technology
Prerequisite Course(s): Introduction to Web Designing (SEIT1010)

**Teaching & Examination Scheme:**

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand the basic of PHP.
- understand working knowledge of dynamic web site design.
- Learn the use cookies and sessions.
- understand how to work with form data.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction to PHP**<br>Client-Server Model, Scripting Languages vs. Programming Language, PHP, MySQL, WAMP/XAMPP installation, Usage of PHP in IT industry.<br>Evaluation of PHP, Basic Syntax, Defining variable and constant, Data type, Operator and Expression. | 04 | 08 |
| 2. | **Decisions and loop**<br>Making Decisions, Doing Repetitive task with looping, Mixing, Decisions, and looping. | 03 | 12 |
| 3. | **Function**<br>What is a function, define a function, Call by value and Call by reference, Recursive function, PHP include () and require (), String, Creating and accessing, String Searching & Replacing String, Formatting String, String, Related Library function? | 04 | 15 |
| 4. | **Array**<br>Anatomy of an Array, creating an index based and Associative array Accessing array, Element Looping with Index based array, looping with associative array using each () and foreach (), Some useful Library function. | 04 | 15 |

| Section II | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Handling Html form with PHP**<br>Capturing Form, Data Dealing with Multi-value filed, and Generating File uploaded form, redirecting a form after submission.<br>Working with file and Directories:<br>Understanding file& directory, Opening, and closing, a file, Coping, renaming and deleting a file, working with directories, Creating and deleting the folder, File Uploading & Downloading. | 06 | 20 |
| 2. | **Session and Cookie**<br>Introduction to Session Control, Session Functionality, Cookies, Setting Cookies with PHP. Using Cookies with Sessions, Deleting Cookies, Registering Session variables, Destroying the variables and Session. | 04 | 10 |
| 3. | **Database Connectivity with MySql**<br>Introduction to RDBMS, Connection with MySql Database, performing basic database operation (DML- Insert, Delete, Update, Select), Setting query parameter, Executing query-Join (Cross joins, Inner joins, Outer Joins, Self-joins.) | 05 | 20 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction to PHP. | 02 |
| 2. | Basics of PHP<br>• Data Types<br>• Operators<br>• Conditional Statements<br>• Loops | 08 |
| 3. | Implementation of functions<br>• Types of functions | 08 |
| 4. | Implementation of Arrays | 06 |
| 5. | Implementation of forms.<br>• Validation | 04 |
| 6. | Implementation of file operations<br>• Creation of file, open, read, write | 06 |
| 7. | Implement of string functions. | 02 |
| 8. | Implementation of cookies.<br>• Create, modify, delete | 08 |
| 9. | Implementation of session<br>• Start, get values, modify values, destroy | 06 |
| 10. | Implementation of database connectivity. | 06 |
| 11. | Create an application. | 04 |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Learning PHP, MySQL & JavaScript | Michele Davis, Jon Phillips | O' Reilly Media |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| PHP for the Web: Visual QuickStart Guide | Larry Ullman | Peachpit Press. |
| PHP, MySQL, and Apache All in One | Juliea C. Meloni | SAMS series, Pearson Education |

**Web Material Link(s):**

- https://www.lynda.com/PHP-training-tutorials/282-0.html
- https://www.w3schools.com/php/php_ref_overview.asp

**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.
- External viva consists of 30 marks in End Semester Exam.

**Course Outcome(s):**

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

- understand the structure of open source technologies.
- gain the PHP programming skills needed to successfully build interactive, data-driven sites.
- work with form data.

**P P Savani University**
**School of Engineering**

**Department of Information Technology**

Course Code: SEIT3062
Course Name: Cryptography & Network Security
Prerequisite Course(s): Computer Network (SECE3011) and Mathematical Methods for Computation (SESH2051).

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 02 | 00 | 04 | 40 | 60 | 20 | 30 | 00 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- 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**<br>Symmetric Cipher Model, Cryptography and Cryptanalysis, Types of Security, Security Services, Security Attacks and Security Mechanisms, Substitution and Transposition techniques. | 02 | 05 |
| 2. | **Classical Encryption Techniques**<br>Substitution Ciphers, Permutation/Transposition Ciphers, PlayFair and Hill Ciphers, Polyalphabetic Ciphers, OTP and Machine Ciphers. | 03 | 05 |
| 3. | **Mathematics of Cryptography 1**<br>Integer arithmetic, modular arithmetic. | 02 | 05 |
| 4. | **Stream Ciphers and Block Ciphers**<br>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. | 05 | 10 |
| 5. | **Multiple Encryption and Triple DES**<br>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**<br>Algebraic Structures, GF ($2^n$) fields. | 02 | 05 |
| 7. | **Public Key Cryptosystems**<br>Public Key Cryptosystems with Applications, Requirements and Cryptanalysis, RSA algorithm, its computational aspects and security, Diffie-Hillman Key Exchange algorithm, Man-in-Middle attack. | 04 | 10 |
| 8. | **Key Management and Distribution**<br>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**<br>Cryptographic Hash Functions, their applications, Simple hash functions, its requirements and security, Hash functions based on Cipher Block Chaining, Secure Hash Algorithm (SHA). | 05 | 05 |
| 2. | **Message Authentication Codes**<br>Message Authentication Codes, its requirements and security, MACs based on Hash Functions, Macs based on Block Ciphers. | 02 | 05 |
| 3. | **Digital Signature, its properties**<br>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**<br>Remote user authentication with symmetric and asymmetric encryption, Kerberos. | 02 | 05 |
| 5. | **Network Security**<br>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**<br>Packet filters, Application level gateways, Encrypted tunnels, Cookies, Web security problems. | 02 | 05 |
| 7. | **Application Layer Security**<br>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). | 02 | 05 |
| 8. | **Security at Network Layer**<br>SSL and TLS. IPSec, AH, ESP, IKE. | 04 | 10 |
| 10. | **Advanced Topics**<br>Intruders, Virus, Trojans, Malware, Ransomware. | 02 | 05 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 6. | Write a program to implement Ceaser cipher. | 02 |
| 7. | Write a program to implement the Playfair cipher. | 02 |
| 8. | Write a program to implement the columnar transposition cipher. | 02 |
| 9. | Write a program to implement rail fence transposition cipher. | 02 |
| 10. | Write a program to implement Vernam cipher. | 02 |
| 11. | Write a program to implement n-gram Hill Cipher. | 02 |
| 12. | Write a program to implement the Vigenere Cipher. | 02 |
| 13. | Write a program that implements the Extended Euclidean Algorithm to find inverse of a given number in the Galois field. | 02 |
| 14. | Write a program to implement DES Cipher. | 04 |
| 15. | Write a program to implement AES Cipher. | 04 |
| 16. | Write a program to implement RSA Cryptosystem. | 04 |
| 17. | 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, 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, 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/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 Engineering**

## Department of Information Technology

Course Code: SEIT3071
Course Name: Advance Java Technology
Prerequisite Course: Object Oriented Programming with Java (SEIT1030)

**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 | 20 | 30 | 0 | 0 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand J2EE architecture.
- construct web application using servlets, Java Server pages.
- learn advanced java programming concepts like hibernate, Enterprise java beans, etc.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No | Content | Hours | Weightage in % |
| 1. | **Client Server Technology**<br>Introduction to Single Tier Architecture, Two Tier Architecture, Multitier Architecture, HTTP protocol: Request and Response, Web Container, Web Server, Overview of J2EE, J2EE Architecture, J2EE Technology. | 05 | 10 |
| 2. | **Servlets Programming**<br>Introduction, Servlet Implementation, Servlet configuration, Servlet life cycle, servlet session, Context and Collaboration, Web Archive files, Deployment Descriptor, Deployment Configuration. | 09 | 20 |
| 3. | **Java Server Page**<br>**JSP:** Overview, lifecycle, Architecture,<br>**JSP Elements:** Directives, Scripting, Action tags, Implicit Objects, Comments, Custom Tags, page,<br>**Scope:** page, request, session, JSP Exception Handling. | 09 | 20 |
| **Section II** | | | |
| Module No | Content | Hours | Weightage in % |
| 1. | **JDBC**<br>Introduction to java database programming, JDBC driver types, Steps to connect JDBC, JDBC statement interface, JDBC prepared statement interface, JDBC callable statement interface, Transaction management, Java beans. | 06 | 15 |

| | | | |
|---|---|---|---|
| 2. | **Web Services**<br>Introduction, Web Service Technology, J2EE for web service, developing web services. | 06 | 10 |
| 3. | **Hibernate**<br>Introduction, Hibernate Architecture, component of Hibernate, Hibernate query Language, Hibernate O/R mapping. | 06 | 15 |
| 4. | **EJB**<br>Enterprise bean architecture, Benefits of enterprise bean, types of beans, Accessing beans, packaging beans. | 04 | 10 |

**List of Practical:**

| Sr. No | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction to client-server architecture | 02 |
| 2. | Study and implementation of servlet programming | 06 |
| 3. | Study and implementation of java server page | 06 |
| 4. | Study and implementation of java database connectivity | 06 |
| 5. | Study and implementation of web service | 04 |
| 6. | Study and implementation of hibernate | 04 |
| 7. | Study and implementation of EJB | 02 |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Complete Reference J2EE | James Keogh | Mc Graw Hill |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Spring in Action 3rd edition | Craig walls | Manning |
| JDBC™ API Tutorial and Reference | Maydene Fisher, Jon Ellis, Jonathan Bruce | Addison Wesley |

**Web Material Link(s):**

- https://www.javatpoint.com/servlet-tutorial/
- https://www.javatpoint.com/jsp-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 the performance of practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 15 marks during End Semester Exam.
- Viva/oral performance consists of 15 marks during End Semester Exam.

**Course Outcome(s):**

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

- understand Client-Server Architecture.
- design web applications using a servlet, Java Server Pages.
- understand fundamentals of all advance Java concepts.

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

Course Code: SECE3031
Course Name: Data Warehousing & Data Mining
Prerequisite Course(s): Database Management System (SECE2011)

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 02 | 00 | 04 | 40 | 60 | 20 | 30 | 00 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- identify the key processes of data mining as part of the knowledge discovery process.
- discover the knowledge imbibed in the high dimensional system.
- apply data mining techniques to solve real-time problems.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction**<br>Motivation and Importance, Different kinds of Data, Data Mining Functionalities, Classification of data mining systems, Major issues in Data Mining. | 03 | 10 |
| 2. | **Data Pre-processing**<br>Overview, need for pre-processing, Issues related to efficient data handling (Extraction, Transformation, And updating of large databases), Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy. | 08 | 15 |
| 3. | **Data Warehouse and OLAP Technology**<br>Multidimensional data model, Data warehouse Architecture, Data warehouse implementation, Efficient methods for data cube computation, Attributes Oriented Induction. | 06 | 15 |
| 4. | **Mining Frequent Patterns, Associations and Correlations**<br>Basic concept, Efficient and scalable frequent itemset mining methods, Mining Association Rules, Association Mining to Correlation Analysis, Constraint-Based Association mining. | 05 | 10 |

| Section II | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Classification**<br>Introduction, Issues regarding classification, Classification by decision tree induction, Bayesian classification, rule-based classification, classification by back propagation, support vector machines, associative classification, lazy learners. | 06 | 16 |
| 2. | **Prediction**<br>Classification vs. prediction, issues of prediction, linear regression, nonlinear regression, accuracy and error measures, evaluation of the accuracy of a classifier or predictor, ensemble methods. | 06 | 14 |
| 3. | **Cluster Analysis**<br>Types of data in cluster analysis, a categorization of major clustering methods, partitioning methods, hierarchical methods, density-based methods, grid-based methods, model-based clustering methods, clustering high dimensional data, outlier analysis. | 11 | 20 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction to data mining tool: Weka | 04 |
| 2. | Solve classification problems using WEKA | 04 |
| 3. | Solve clustering problems using WEKA | 04 |
| 4. | Introduction to data mining tool: XL Miner | 02 |
| 5. | Introduction to data mining tool: Rapid Miner | 02 |
| 6. | Introduction to data mining tool: Orange | 02 |
| 7. | Introduction to data mining tool: R | 02 |
| 8. | Introduction to data mining tool: Knime | 02 |
| 9. | Introduction to data mining tool: Tanagra | 02 |
| 10. | Tools to create different data warehouse schemas | 06 |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Data Mining Concepts and Techniques | Jiawei Han, Micheline Kamber Jian Pei | Elsevier |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Data Mining | Arun K. Pujari | University Press |
| Data Warehousing Fundamentals | Paulraj Ponnian | John Willey & Sons |
| Introduction to Data Mining | Tan, Steinbach, Karpatne, Kumar | Addison-Wesley |

**Web Material Link(s):**

- https://www.cs.waikato.ac.nz/ml/weka
- https://ocw.mit.edu/courses/sloan-school-of-management/15-062-data-mining-spring-2003/
- https://www.tutorialspoint.com/dwh/dwh_data_warehousing.htm

**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 per each practical and the average of the entire practical will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 15 marks.
- External viva consists of 15 marks during End Semester Exam.

**Course Outcome(s):**

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

- learn to discover interesting patterns from large amounts of data to analyze predictions and classification.
- understand warehousing architectures and tools for systematically organizing data and use the data to make strategic decisions.
- develop a data mining application for data analysis using various tools.

**P P Savani University**
**School of Engineering**

**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 of the professional etiquettes and tactics to follow them.

**Course Content:**

| **Section – I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Corporate Grooming**<br>• Introduction to corporate culture<br>• Corporate Expectations<br>• Need of Self-Grooming to the Corporate Expectations<br>• Understanding and importance of Professionalism | 03 | 25 |
| 2. | **Personal Skills**<br>• Behavioral skills<br>• Language Skills<br>• Knowledge Skills<br>• Problem Solving Skills<br>• Developing professional attitude | 04 | 25 |
| **Section – II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Management Skills**<br>• Self-management<br>• Time management<br>• Work-life balance | 04 | 25 |

| | | | |
|---|---|---|---|
| 2. | **Organizational Etiquettes**<br>• General Workplace Etiquettes<br>• Presentation Etiquettes<br>• 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, Bulelwa Monica Maphela | Lambert Academic Publishing |
| Effective Communication Skills for Public Relations | Andy Green | Kogan Page Ltd. |
| 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 | Jossey-Bass,3rd Edition 2011. |
| Cross Cultural Management: Concepts and Cases | Shobhana 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 | Wiley & Sons, 2012 |

**Course Evaluation:**

**Practical**

- Continuous Evaluation consists of the performance of practical to be evaluated out of 10 marks 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 consists of 25 marks during End Semester Exam.
- Viva/oral performance consists of 25 marks during End Semester Exam.

**Course Outcome(s):**

After completion of the course, the students 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.

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

Course Code: SECE3910
Course Name: Minor 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 | |
| 00 | 04 | 00 | 04 | 00 | 00 | 100 | 100 | 00 | 00 | 200 |

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 Seminar:**

| Sr. No | Seminar 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 | Hours | Weightage in % |
|---|---|---|---|
| 1. | **Selection of Title**<br>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. | 06 | 10 |
| 2. | **Literature Review**<br>Study of various technology or area to select a topic of the seminar. | 12 | 10 |
| 3. | **Gap identification and Proposal**<br>Students must identify the gaps in the existing research and design a proposal which will help in overcome the same. | 10 | 20 |

| | | | |
|---|---|---|---|
| 4. | **Implementation**<br>Students must implement their proposal in any of the programming languages. | 20 | 35 |
| 5. | **Report Writing**<br>The report must be prepared as per suggested guidelines consisting of Preamble, Objectives, Scope, Introduction, Conclusions, Recommendations and Annexure. | 07 | 15 |
| 6. | **Presentation & Question-Answer**<br>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 related field (Within first 30 Days of commencement of semester) | 40 |
| 2. | Initial Presentation of the topic (Within 31 to 40 Days of commencement of semester) | 40 |
| 3. | An actual work carried out (Within 41 to 60 Days of commencement of semester) | 40 |
| 4. | Report writing as per guidelines | 40 |
| 5. | Final Presentation & Question-Answer session | 40 |
| | **Grand Total:** | **200** |

**The entire evaluation will be converted equivalent to 200 Marks.**

**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.
- apply knowledge in the field.

**P P Savani University**
**School of Engineering**

**Center for Language Studies**

Course Code: CFLS3032
Course Name: Foreign Language - III
Prerequisite Course(s): Foreign Language – I (CFLS3010), Foreign Language – I (CFLS3021)

**Teaching & Examination Scheme:**

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- develop and integrate the use of the four Language skills i.e. listening, speaking, reading and Writing.
- use the language effectively and appropriately on topics of everyday life situations.
- develop an interest in the appreciation of French.
- develop an intercultural awareness.
- enhance the ability of the candidates to express their ideas and feelings in their own words and for
- to understand the use of correct language.
- appreciate the language as an effective means of communication.
- understand language when spoken at normal conversational speed in everyday life situations.
- understand the basic structural patterns of the language, vocabulary and constructions.

**Course Content:**

| **Section I – Theory** | | | |
|---|---|---|---|
| **Unit** | Content | Hours | Weightage |
| 1. | Introduction to DELF(four communication skills Reading , writing ,speaking ,listening)<br>Reading<br>Comprehensions<br>Mcq questions | 5 | 25% |
| 2. | Speaking part-1<br>Introduction **Entretien Dirigé**<br>-Name,Nationality,Age,Situation of family,Free time activities,Hobbies,Favoraites etc.<br>Part-2<br>**Échange D'information**<br>From the cards with words, you have to prepare questions. | 5 | 25% |

| | | | |
|---|---|---|---|
| 3. | Speaking part-3<br>**Dialogue simulé ou jeu de role**<br>Speaking on:<br>At the market<br>At the café<br>Grocery store<br>Club booking<br>At the bakery | 5 | 25% |
| 4. | Form filling<br>Letter writing | 5 | 25% |
| **Section II – Practical** | | | |
| **Unit** | **Content** | **Hours** | **Weightage** |
| 1. | Role plays | 5 | 50% |
| 2. | French movies | 5 | 50% |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Namaste German | Yoshita Dalal | Yoshita Dalal |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Fit In Deutsch | Hueber | Goyal Publication |

**Web Material Link(s):**

- https://www.youtube.com/watch?v=iGovllrEsF8&list=PLRps6yTcWQbpoqIOCmqMeI1HLnLIRmO_t
- https://www.youtube.com/watch?v=GwBfUzPCiaw&list=PL5QyCnFPRx0GxaFjdAVkx7K9TfEklY4sg

**Course Evaluation:**

**Theory:**

- Continuous Evaluation consists of a test of 30 marks and 1 hour of duration.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination consists of 60 marks exam.

**Course Outcome(s):**

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

- demonstrate the level of proficiency necessary to enable them to function in an environment where French is used exclusively.
- demonstrate speaking, listening, reading, and writing in French.
- Delf exam certification will be valid throughout the world.

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

Course Code: SECE3511
Course Name: Programming with .NET
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 | |
| 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.
- understand the basics of C#.
- understand ASP.NET web services and web service security.

**Course Content:**

| **Section – I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction to .NET Framework**<br>.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#**<br>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**<br>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**<br>The Windows Forms Model, Creating Windows Forms Windows Forms Properties and Events, Windows Form Controls, Menus, Dialogs, Tool Tips, Printing - Handling Multiple Events, GDI+, Creating Windows Forms Controls. | 04 | 14 |
| 2. | **ASP.NET**<br>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**<br>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, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

**Practical:**

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

**Course Outcome(s):**

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

- 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 Engineering**

**Department of Information Technology**

Course Code: SEIT3510
Course Name: System Analysis and Design
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 | 50 | 00 | 00 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- gather data to analyze and specify the requirements of a system.
- build general and detailed models that assist programmers in implementing a system.

**Course Content:**

| **Section – I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Data and Information**<br>Types of information – operational, tactical, strategic and statutory, why do we need information systems? management structure, requirements of information at different levels of management. | 05 | 16 |
| 2. | **Systems Analysis and Design Life Cycle**<br>Requirements determination, requirements specifications, feasibility analysis, final specifications, hardware and software study, system design, system implementation, system evaluation, system modification. Role of systems analyst, attributes of a systems analyst, tools used in system analysis. | 05 | 16 |
| 3. | **Information gathering**<br>Strategies, methods, case study, documenting study, system requirements specification – from narratives of requirements to classification of requirements as strategic, tactical, operational and statutory. | 05 | 18 |

| Section II | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Feasibility analysis**<br>Deciding project goals, examining alternative solutions, cost, benefit analysis, quantifications of costs and benefits, payback period, system proposal preparation for managements, parts and documentation of a proposal, tools for prototype creation. | 04 | 14 |
| 2. | **Tools for systems analysts**<br>Data flow diagrams, case study for use of DFD, good conventions, leveling of DFDs, leveling rules, logical and physical DFDs, software tools to create DFDs. | 04 | 12 |
| 3. | **Data oriented systems design**<br>Entity relationship model, E-R diagrams, relationships cardinality and participation, normalizing relations, various normal forms and their need, some examples of relational data base design. | 04 | 14 |
| 4. | **Structured systems analysis and design**<br>Procedure specifications in structured English, examples and cases, decision tables for complex logical specifications, specification-oriented design vs procedure-oriented design. | 03 | 10 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | Prepare a Context level DFD diagram and as many sublevel DFDs by identifying the processes, the entities and arrows to show how the information is passed from one process to another. | 06 |
| 2. | Prepare a Data Flow Diagram that is drawn for a Food Ordering System. It should contain a process that represents the system. It should also show the participants who will interact with the system | 06 |
| 3. | Prepare an E-R Diagram showing the relationships one-to-one, one-to-many and many-to-many listing assumptions to justify your answer. | 06 |
| 4. | The owner is thinking to add a 24-automated rental machine to facilitate his customers to rent any movie at any time of the day, 365 days of the year but before taking his decision he would like to see the response of his customers of how much they would welcome such a facility. As a systems analyst you currently do not have any customer response and you are required to prepare a questionnaire of your own choice i.e. open, closed, bipolar, etc. to gather a fair customer response regarding a24-automated rental machine. | 06 |
| 5. | Case Study on feasibility analysis. | 06 |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| System Analysis and Design | Allen Dennis, Barbara Haley Wixom, Roberta M. Roth | Wiley |
| Modern System Analysis and Design | Jeffery A. Hoffer, Joey F. George, Joseph H. Valacich, Prabin K. Panigrahi | Pearson |
| Analysis and Design of Information systems | V. Rajaraman | PHI publication |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| System Analysis and Design Methods | Jeffery L. Whitten, Lonnie D. Bentley. | McGraw Hill Education |

**Web Material Link(s):**

- https://nptel.ac.in/courses/106108102/
- https://www.oreilly.com/library/view/systems-analysis
- https://www.w3computing.com/systemsanalysis/

**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 per each practical. At the end of the semester, the average of the entire practical will be converted to 30 marks.
- Internal submission consists of viva and presentation of the case study document/report prepared as per guidelines of the course coordinator to be evaluated out of 20 marks.

**Course Outcome(s):**

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

- analyze business problems and develop a requirements document, written in clear and concise business language.
- present this document to a business audience.

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

Course Code: SECE3520
Course Name: Service Oriented Architecture
Prerequisite Course(s): --

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 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 underlying principles of Service Oriented Architecture.
- describe and understand different terminologies used in Service Oriented Architecture.
- apply the different concepts of SOA to build different applications.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction**<br>Fundamental SOA, Characteristics of contemporary SOA, Misperception timeline, Continuing evolution of SOA, Roots of SOA Service-orientation and object-orientation, Web Services, Key Principles of SOA. | 03 | 10 |
| 2. | **Enterprise architectures**<br>Integration versus interoperation, J2EE, .NET, Model Driven Architecture, Concepts of Distributed Computing, XML. | 04 | 20 |
| 3. | **Basic Concepts**<br>Web services framework, Services (Web services: Definition, Architecture, and standards), Service descriptions with WSDL, Messaging with SOAP, UDDI. | 08 | 20 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Principles of Service-Oriented Architecture**<br>Message Exchange Pattern, Coordination, Atomic Transactions, Business Activities, Orchestration, Choreography, WS-Addressing, WS-Reliable Messaging, WS-Policy (including WS-Policy Attachments and WS-Policy Assertions), WS-Metadata | 07 | 20 |

| | | | |
|---|---|---|---|
| | Exchange, WS-Security (including XML-Encryption, XML-Signature, and SAML). | | |
| 2. | **Principles of Service-Oriented Computing**<br>RPC versus Document Orientation, Service Life Cycle, Service Creation, Service Design and Build, Service Deployment, Publish Web service using UDDI, Service Discovery, Service Selection, Service Composition, Service Execution, and Monitoring, Service Termination. | 08 | 30 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | Develop DTD and XSD for University Information System having Exam Enrollment from the beginning of Semester, along with Exam Registration and Marks submission by Teachers to University from Various Colleges and Results in Sheets Generation by University on Online Report. | 02 |
| 2. | Develop Mark sheet XML Document and display Mark sheet based on CSS and XSL presentation Format. | 04 |
| 3. | Develop Java Based Program using JAXP or XML API in reading XML file for Students Information and Display HTML Table. | 02 |
| 4. | Develop Java Based Web Service using REST and SOAP-Based web service in NetBeans for University Course List and Search Course based Course Title and Course ID. | 04 |
| 5. | Create DTD file for student information and create a valid well-formed XML document to store student information against this DTD file. | 02 |
| 6. | Create XMS schema file for student information and create a valid well-formed XML document to store student information against this DTD file. | 04 |
| 7. | Create web calculator service in .NET Beans and create Java client to consume this web service. | 02 |
| 8. | Develop same web service using JX-WS. | 04 |
| 9. | Create web calculator service in .NET and Create java client to consume web service developed using Apache AXIS. | 02 |
| 10. | Using WS –GEN and WS-Import develop the java web service & call it by Java Client. | 04 |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Service Oriented Architecture: Concepts, Technology, and Design | Thomas Erl | Pearson education |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Applied SOA | Michael Rosen, Boris L, Kevin S., Marc J. B. | Wiley Publication. |
| SOA based Enterprise Integration | Waseem Roshen | TMH Publication |

**Web Material Link(s):**

- https://www.service-architecture.com/articles/web-services/service-oriented_architecture_soa_definition.html

**Course Evaluation:**

**Theory:**

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

**Practical:**

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

**Course Outcome(s):**

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

- understand the concepts of Service Oriented Architecture along with the evolution of SOA.
- understand primary concepts of SOA.
- know the integration of SOA technological points with Web Services.
- implementation of SOA in the development cycle of Web Services.
- integrate SOA technologies with Web Services paradigms.
- can learn the reference model of Service Oriented baseline backend design for the cloud environment.

**P P Savani University**
**School of Engineering**

**Department of Computer Engineering**

Course Code: SECE3531
Course Name: Wireless Network and Mobile Computing
Prerequisite Course(s): Computer Networks (SECE3011)

**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. | **Mobile Computing Architecture**<br>Types of Networks, Architecture for Mobile Computing, 3-tier Architecture, Design Considerations for Mobile Computing, Applications.<br>**Wireless Transmission**<br>Signals, Antennas Signal propagation, Multiplexing, Modulation, Cellular Systems.<br>**Medium Access Control**<br>Motivation for a specialized MAC, SDMA, FDMA, TDMA, CDMA. | 03 | 05 |
| 2. | **Wireless Networks – 1**<br>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**<br>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**<br>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**<br>Mobile IP, Dynamic Host Configuration protocol, Mobile ad-hoc networks<br>**Mobile Transport layer**<br>Traditional TCP, classical TCP improvements, TCP over 3G/4G wireless networks | 04 | 10 |
| 2. | **Mobile OS and Computing Environment**<br>Smart Client Architecture,<br>The Client: User Interface, Data Storage, Performance, Data Synchronization, Messaging.<br>The Server: Data Synchronization, Enterprise Data Source, Messaging.<br>Mobile Operating Systems, The Development Process, | 04 | 15 |
| 3. | **Building Mobile Internet Applications**<br>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 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

**Practical:**

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

**Course Outcome(s):**

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

- 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 Engineering**

**Department of Computer Engineering**

Course Code: SECE3541
Course Name: Software Testing & Quality Assurance
Prerequisite Course(s): Software Engineering (SEIT3010)

**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 correctness, completeness and quality of developed Software.
- identify the importance of software testing in Software Development Life-Cycle.
- gain knowledge about various types of software testing.
- train students to create good test cases and improve the quality of software.
- study software testing process and various automated software testing tools.
- develop an application and test it using any automated testing tool.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction to Basic of software testing & Terminology** Software Development & Software Testing Life Cycle- role and activities, Necessity and Objectives of testing, Quality Concepts, Quality Control, McCall's factor model, Different Software Development Model, Object– oriented testing, Web testing, GUI testing, Elements of Software quality assurance, Quality Assurance Activities, Statistical Quality Assurance, Software Reliability, SQA plan, Testing Standards:-IEEE, CMM, ANSI | 5 | 10 |
| 2. | **Levels of Testing** Verification and Validation Model, Techniques of Verification:- Peer Review, Walkthrough, Inspection, FTR, Unit testing, Integration testing, Function Testing, System testing**,** Installation Testing, Usability Testing, Regression testing, Performance testing**:-**Load Testing**,** Stress Testing**,** Security testing**,** Volume testing, Acceptance testing**:-**Alpha testing, Beta testing, Gamma testing. | 6 | 20 |

| | | | |
|---|---|---|---|
| 3. | **Testing Methods**<br>Black Box methods**: -**Equivalence partitioning**,** Boundary-value analysis**,** Error guessing, graph-based testing methods, Decision Table Testing.<br>White Box methods**: -**Statement coverage**,** Decision coverage**,** Condition coverage, Path testing, Data flow testing. | 4 | 20 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Testing Tools**<br>Features of test tool, Guidelines for selecting a tool, Tools and skills of tester, Static testing tools, Dynamic testing tools, Advantages and disadvantages of using tools, Introduction to open source testing tool. | 4 | 15 |
| 2. | **Test Planning & Documentation**<br>Development plan and quality plan objectives, Testing Strategy: -type of project, type of software, Test Management, Strategic Management, Operational Test Management, Managing the Test Team, Test Plans, Test Case, Test Data, Risk Analysis. | 6 | 15 |
| 3. | **Defect Management and Test Reporting**<br>Defect Classification, Defect Management Process, Defect Management Tools, Defect life cycle, Defect Reporting, Test reporting, Qualitative and quantitative analysis, Fagan Inspection. | 5 | 20 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | Study of manual and automated Testing | 02 |
| 2. | Introduction to open source testing tool | 04 |
| 3. | Recording test in analog and context sensitive mode | 02 |
| 4. | Synchronizing test | 02 |
| 5. | Checking GUI Objects | 02 |
| 6. | Checking Bitmap Objects | 02 |
| 7. | Creating data driven test | 02 |
| 8. | Maintaining test script | 02 |
| 9. | Project (Creating test report in Bugzilla) | 10 |
| 10. | Developing test cases for a particular task | 02 |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Software testing principles, Techniques and Tools | M.G.Limaye | Tata McGraw Hill |
| Software testing | Ron Pattorn | Tech Publications |
| Software Engineering- a practitioner's approach | Roger Pressman | McGraw Hill |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Software testing | Rex Black, | Wrox Publications |
| Software testing techniques | Boris Bezier | Dreamtech Publications |
| Effective Methods for Software Testing | William E. Perry | Wiley Publications |

**Web Material Link(s):**

1. https://nptel.ac.in/courses/106105150/
2. https://www.tutorialspoint.com/software_testing/software_testing_qa_qc_testing.htm
3. https://www.softwaretestinghelp.com/web-application-testing/

**Course Evaluation:**

**Theory:**

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

**Practical:**

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

**Course Outcome(s):**

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

- to understand the importance of software testing in software development process.
- to generate test cases from software requirements.
- to identify the inputs and deliverables of the testing process.
- to understands the importance of automated software testing tools.

**P P Savani University**
**School of Engineering**

**Department of Information Technology**

Course Code: SEIT3531
Course Name: Image Processing
Prerequisite Course(s): Computer Graphics & Multimedia (SECE2051)

**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 the learners to

- understand the fundamentals of image processing.
- apply various processes on images for image understanding.
- understand the design aspects and realization of image processing applications.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction and Digital Image Fundamentals** Digital Image Fundamentals, Human visual system, Image as a 2D data, Image representation – Grayscale and Color images, image sampling and quantization. | 03 | 15 |
| 2. | **Image enhancement in the Spatial domain** Basic gray level Transformations, Histogram Processing Techniques, Spatial Filtering, Low pass filtering, High pass filtering. | 05 | 15 |
| 3. | **Filtering in the Frequency Domain:** Preliminary Concepts, Extension to functions of two variables, Image Smoothing, Image Sharpening, Homomorphic filtering. | 03 | 10 |
| 4. | **Image Restoration and Reconstruction:** Noise Models, Noise Reduction, Inverse Filtering, MMSE (Wiener) Filtering. | 04 | 10 |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Color Image Processing:** Color Fundamentals, Color Models, Pseudo color image processing. | 02 | 10 |

| | | | |
|---|---|---|---|
| 2. | **Image Compression**<br>Fundamentals of redundancies, Basic Compression Methods: Huffman coding, Arithmetic coding, LZW coding, JPEG Compression standard. | 03 | 10 |
| 3. | **Morphological Image Processing**<br>Erosion, dilation, opening, closing, Basic Morphological Algorithms: hole filling, connected components, thinning, skeleton. | 02 | 10 |
| 4. | **Image Segmentation**<br>point, line and edge detection, Thresholding, Regions Based segmentation, Edge linking and boundary detection, Hough transform. | 04 | 10 |
| 5. | **Object Recognition and Case studies**<br>Object Recognition- patterns and pattern classes, recognition based on decision-theoretic methods, structural methods, case studies – image analysis, Application of Image processing in process industries. | 04 | 10 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction to Image Processing Toolbox. | 04 |
| 2. | Read an 8bit image and then apply different image enhancement techniques: (a) Brightness improvement<br>(b) Brightness reduction<br>(c) Thresholding<br>(d) Negative of an image<br>(e) Log transformation<br>(f) Power Law transformation. | 02 |
| 3. | Implement different interpolation techniques using MATLAB/ Scilab. | 02 |
| 4. | Read an image, plot its histogram then do histogram equalization and comment about the result. | 02 |
| 5. | (a) Implement Gray level slicing (intensity level slicing) in to read cameraman image. (b) Read an 8bit image and to see the effect of each bit on the image. (c) Read an image and to extract 8 different planes i.e. 'bit plane slicing." | 04 |
| 6. | Implement various Smoothing spatial filter | 02 |
| 7. | Read an image and apply (1) Gaussian 3x3 mask for burring (2) High pass filter mask with different masks (3) Laplacian operator with center value positive and negative (4) High boost filtering. | 02 |
| 8. | Write a program to implement various low pass filters and high pass filter in the frequency domain. | 02 |
| 9. | Write a program for erosion and dilation, opening & closing using inbuilt and without inbuilt function. | 02 |
| 10. | Implement and study the effect of Different Mask (Sobel, Prewitt, and Roberts) | 02 |
| 11. | Implement various noise models and their Histogram | 02 |

| | | |
|---|---|---|
| 12. | Implement inverse filter and Wiener filter over image and comment on them | 02 |
| 13. | Implement Image compression using DCT Transform | 02 |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Digital Image Processing | Rafael C. Gonzalez, Richard E. Woods | Pearson Education |
| Fundamentals Digital Image Processing | Jain Anil K. | Prentice Hall India Learning |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Image Processing, Analysis and Machine Vision | Milan Sonka, Vaclav Hlavac, Roger Boyle | CL Engineering |
| Biomedical Image Analysis | Rangaraj M. Rangayyan | CRC Press |
| Digital Image Processing | William K. Pratt | John Wiley & Sons |

**Web Material Link(s):**

- https://nptel.ac.in/courses/106105032/

**Course Evaluation:**

**Theory:**

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

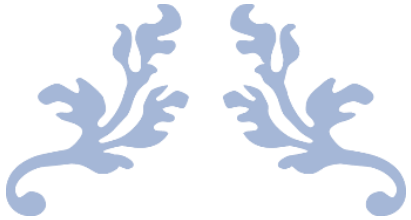
**Practical:**

- Continuous Evaluation consists of the performance of practical which will be evaluated out of 10 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

- apply knowledge of mathematics for image understanding and analysis.
- design and analysis of techniques/processes for image understanding.
- design, realize and troubleshoot various algorithms for image processing case studies.
- select the appropriate hardware and software tools (Contemporary) for image analysis.



# FOURTH YEAR B. TECH.

| P P SAVANI UNIVERSITY | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCHOOL OF ENGINEERING | | | | | | | | | | | | | | | | |
| TEACHING & EXAMINATION SCHEME FOR B. TECH. INFORMATION TECHNOLOGY PROGRAMME AY: 2019-20 | | | | | | | | | | | | | | | | |
| **Sem** | **Course Code** | **Course Title** | **Offered By** | **Teaching Scheme** | | | | | **Examination Scheme** | | | | | | | |
| | | | | **Contact Hours** | | | | **Credit** | **Theory** | | **Practical** | | **Tutorial** | | **Total** |
| | | | | **Theory** | **Practical** | **Tutorial** | **Total** | | **CE** | **ESE** | **CE** | **ESE** | **CE** | **ESE** | |
| **7** | SEIT4013 | Data Science | IT | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SECE4022 | Cloud Computing & Applications | CE | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SECE4031 | Internet of Things | CE | 2 | 4 | 0 | 6 | 4 | 40 | 60 | 40 | 60 | 0 | 0 | 200 |
| | SECE4042 | Artificial Intelligence | CE | 3 | 2 | 0 | 5 | 4 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SEIT4920 | Major Project | IT | 3 | | | 3 | 3 | 0 | 0 | 100 | 100 | 0 | 0 | 200 |
| | SEPD4010 | Creativity, Problem Solving & Innovation | SEPD | 3 | 0 | 0 | 3 | 3 | 40 | 60 | 0 | 0 | 0 | 0 | 100 |
| | SEIT4910 | Summer Internship / Project 4 Weeks | IT | 3 | | | 0 | 3 | 0 | 0 | 100 | 100 | 0 | 0 | 200 |
| | | Elective-III | | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | | | | | | **Total** | **31** | **28** | | | | | | | **1300** |
| **8** | SEIT4930 | Project | IT | 25 | | | 25 | 25 | 0 | 0 | 200 | 300 | 0 | 0 | 500 |
| | | | | | | **Total** | **25** | **25** | | | | | | | **500** |

**P P SAVANI UNIVERSITY**

**SCHOOL OF ENGINEERING**

**TEACHING & EXAMINATION SCHEME FOR FOURTH YEAR B.TECH. INFORMATION TECHNOLOGY PROGRAMME (ELECTIVE COURSES)**

| Sem | Course Code | Department Elective Course Title | Offered By | Teaching Scheme | | | | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Contact Hours | | | | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | Theory | Practical | Tutorial | Total | | CE | ESE | CE | ESE | CE | ESE | |
| 7 | SECE4523 | Machine Learning | CE | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SECE4530 | Research Methodology | CE | 2 | 0 | 1 | 3 | 3 | 40 | 60 | 0 | 0 | 50 | 0 | 150 |
| | SEIT4521 | Blockchain Technology | IT | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SEIT4530 | Cyber Security | IT | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |
| | SEIT4541 | Automata Theory & Language Processor | IT | 2 | 2 | 0 | 4 | 3 | 40 | 60 | 20 | 30 | 0 | 0 | 150 |

**P P Savani University**
**School of Engineering**

## Department of Information Technology

Course Code: SEIT4013
Course Name: Data Science
Prerequisite Course(s): SECE2011 - Database Management System (SECE2011), Data Structures (SECE2031), and Data Warehouse & Data Mining (SECE3031)

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 02 | 00 | 04 | 40 | 60 | 20 | 30 | 00 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- 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. | **Introduction to Data Science**<br>Introduction, Terminology, Data Science Process, Data Science Toolkit, Types of Data, Examples and Applications | 06 | 10 |
| 2. | **Data collection and management**<br>Introduction, Sources of Data, Data Collection and APIs, Exploring and Fixing Data, Data Storage and Management, Using Multiple Data Sources | 07 | 15 |
| 3. | **Statistics for Data Science**<br>Terminology and Concepts of Probability, Introduction to Statistics, Central Tendencies and Distributions, Variance, Outliner Analysis(Box Plot), Distribution Properties and Arithmetic, Inferential Statistics, Introduction to Testing of Hypothesis, Chi-squared test, ANOVA test | 10 | 25 |

| Section II | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Machine Learning Algorithm**<br>Linear Regression, Logistic Regression, Decision Tree, Naïve Bayes, Support Vector Machines, Random Forest, Radial Bases Functions -Appropriate problems for Algorithms | 10 | 25 |
| 2. | **Data Visualization**<br>Introduction, Types of Data Visualization, Data for Visualization: Data Types, Data Encodings, Retinal Variables, Mapping Variables to Encodings, Visual encodings, Applications of Data Science, Technologies for Visualization. | 07 | 15 |
| 3. | Recent Trends in Various Data Collection and Analysis Techniques, Application Development Methods used in Data Science | 05 | 10 |

**List of Practical:**

| Sr. No | Name of Practical | Hours |
|---|---|---|
| 1. | Basics of Python for Data Analysis<br>• Why learn Python for data analysis?<br>• Python 2.7 v/s 3.4<br>• How to install Python?<br>• Running a few simple programs in Python | 04 |
| 2. | Python libraries and data structures<br>• Python Data Structures<br>• Python Iteration and Conditional Constructs<br>• Python Libraries | 06 |
| 3. | Exploratory analysis in Python using Pandas<br>• Introduction to series and data frames<br>• Analytics of dataset- Loan Prediction Problem | 06 |
| 4. | Data Munging in Python using Pandas | 04 |
| 5. | Building a Predictive Model in Python<br>• Logistic Regression<br>• Decision Tree<br>• Random Forest | 10 |

**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.
- Submission of assignment which consists of 5 questions to be answered under each module and it consists of 10 marks.
- 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

- 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;
- Understand how data is analyzed, evaluated and visualized.

**P P Savani University**
**School of Engineering**

## Department of Computer Engineering

Course Code: SECE4022
Course Name: Cloud Computing & Applications
Prerequisite Course(s): Computer Networks (SECE3011), and Operating System (SEIT2031)

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 02 | 00 | 05 | 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 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**<br>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**<br>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**<br>Introduction to Virtualization Technologies, Load Balancing and Virtualization, Understanding Hypervisors, Understanding Machine Imaging, Porting Applications, Virtual Machines Provisioning and Manageability Virtual Machine Migration | 07 | 15 |

| | | | |
|---|---|---|---|
| | Services, Virtual Machine Provisioning and Migration in Action, Provisioning in the Cloud Hypervisors | | |
| 4. | **Cloud Infrastructure and Cloud Resource Management** Architectural Design of Compute and Storage Clouds, Layered Cloud Architecture Development, Design Challenges, Inter Cloud Resource Management, Resource Provisioning and Platform Deployment, Global Exchange of Cloud Resources. Administrating the Clouds, Cloud Management Products, Emerging Cloud Management Standards | 06 | 15 |
| **Section II** | | | |
| Module | Content | Hours | Weightage in % |
| 1. | **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 |
| 2. | **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 |
| 3. | **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 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1 | Write pros and cons of Cloud Computing. | 04 |
| 2 | Summarize Cloud service models with real time examples. | 04 |

| | | |
|---|---|---|
| 3 | Define Virtualization. Also list and explain different Hypervisors. | 04 |
| 4 | Discuss performance evaluation of service over cloud. | 04 |
| 5 | Software study on Hadoop, MapReduce and HDFS. | 04 |
| 6 | Create an AMI for Hadoop and implementing short Hadoop programs on the Amazon Web Services platform. | 06 |
| 7 | Create a scenario that use Amazon S3 as storage on cloud. | 04 |

**Text Book(s):**

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

**Reference Book(s):**

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

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

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

**Practical:**

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

**Course Outcome(s):**

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

- explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
- apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost by Load balancing approach.
- discuss system virtualization and outline its role in enabling the cloud computing system model.
- illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS.
- analyze various cloud programming models and apply them to solve problems on the cloud.
- understand various management and other distinguish services of AWS.
- analyze the billing of resources and other paradigm: how to deal with disasters.
- understand security and compliances for AWS.
- deploy applications over commercial cloud computing infrastructures such as Amazon

**P P Savani University**
**School of Engineering**

## Department of Computer Engineering

Course Code: SECE4031
Course Name: Internet of Things
Prerequisite Course(s): Embedded Systems (SEIT3022)

**Teaching & Examination Scheme:**

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- learn how to interface sensors and Actuators with embedded IoT devices
- select connectivity and communication IoT protocols
- implement IoT applications

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | Introduction<br>Introduction to Internet of things, end-to-end IoT Architecture, Requirement of IoT challenges and issues of IoT , selection of hardware and software, case studies of IoT applications. | 02 | 06 |
| 2. | Embedded IoT Devices<br>Choosing criteria for embedded IoT devices, Enlist MCU based and MPU based IoT devices, Comparison between Aruino Uno, NodeMCU and ESP32, Architecture of ESP8266, variants of ESP8266, Arduino C, GPIO programming. | 05 | 20 |
| 3. | Sensors & Actuators<br>Types of sensors, working principles of actuators, Interfacing & Programming of digital, analog, protocol based sensors and actuators | 04 | 12 |
| 4. | Networking IoT platform<br>Raspberry Pi and its variant, Raspberry Pi programming, Choosing a right board, IoT gateway, Tools, Sensing IoT Environments. | 04 | 12 |

| Section II | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **RFID and iBeacons**<br>Introduction to RFID and iBeacon, Hardware & Software, Hardware used for IoT RFID, Connection to Serve, Data on RFID Server and Classic distributed the problem. | 04 | 14 |
| 2. | **IoT connectivity protocols**<br>Networks layer protocols: RPL and 6LowPAN, WiFi, Bluetooth, BLE, LORAwan, NFC, cellular, zegbee, and Ethernet | 04 | 14 |
| 3. | **IoT communication protocol: MQTT**<br>Existing cloud platforms, Various application layer IoT protocols, MQTT protocol, Building online server using MQTT, data exchange and storage in cloud, User Interface development. | 04 | 14 |
| 4. | **IoT Security**<br>IOT Security, Dangers, Assigning values to Information, Security Components, Key Management, Update Management. | 03 | 08 |

**List of Practical:**

| Sr. No | Name of Practical | Hours |
|---|---|---|
| 1. | Getting started with Arduino IDE, add ESP8266 and ESP32 in the Arduino IDE. GPIO Interfacing and programming | 04 |
| 2. | Digital on/off sensor (PIR and IR) Interfacing programming | 04 |
| 3. | Analog sensors Interfacing (Accelerometer and gyroscope) & programming | 04 |
| 5. | Interfacing and programming of actuators | 04 |
| 6. | Walk through existing library for ESP8266. Configure ESP8266 in station and access mode. | 02 |
| 7. | Development of an offline server using http protocol | 04 |
| 8. | Development of an online server | 04 |
| 9. | Experimenting with existing cloud platforms | 04 |
| 10. | Development of Android applications suitable for IoT | 04 |
| 11. | Exchange information using MQTT protocol | 04 |
| 12. | Getting started with Raspberry Pi and OS Installation | 04 |
| 13. | Experimenting with Raspberry Pi using Python | 04 |
| 14. | Dashboard development using visual programming: NodeRED | 06 |
| 15. | IoT based mini project | 08 |

**Text Book(s):**

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

**Reference Book(s):**

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

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

- Continuous Evaluation consists of two tests 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:**

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

**Course Outcome(s):**

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

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

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## Department of Computer Engineering

Course Code: SECE4042
Course Name: Artificial Intelligence
Prerequisite Course(s): Data Structures (SECE2031), and Mathematical Methods for Computation (SESH2051)

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 03 | 02 | 00 | 05 | 40 | 60 | 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?**<br>What is an AI Technique? The AI Problems and applications, Major areas of Artificial Intelligence, History of AI | 04 | 10 |
| 2. | **Problems, State Space Search & Heuristic Search Techniques**<br>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 | 08 | 20 |
| 3. | **Knowledge Representation Issues**<br>Representations and Mappings, Approaches to Knowledge Representation, Using Propositional logic and Predicate Logic, Resolution, Semantic network, Frame based knowledge | 06 | 10 |
| 4. | **Representing Knowledge Using Rules**<br>Procedural Versus Declarative Knowledge, Forward Reasoning, Backward Reasoning. Symbolic Reasoning, Under Uncertainty: Introduction to Non Monotonic Reasoning, Logics for Non-monotonic Reasoning | 05 | 10 |

| Section II | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Uncertain Reasoning and alternatives**<br>Probability and Bayes' Theorem, Certainty Factors and Rule-Base Systems, Bayesian Networks, Dempster Shafer Theory, Fuzzy sets, Fuzzy Logic, Fuzzy systems, Hidden Markov model | 08 | 20 |
| 2. | **Game Theory**<br>Introduction to Game playing, The Minimax search procedure, Alpha-Beta procedure, Refinements, Iterative Deepening | 05 | 10 |
| 3. | **Natural Language Processing**<br>Introduction, Syntactic Processing, Semantic Analysis, Discourse and Pragmatic Processing, Spell Checking. | 05 | 10 |
| 4. | **Connectionist Models**<br>Introduction to Hopfield Network, Learning in Neural Network, Application of Neural Networks, Recurrent Networks, Introduction to multilayer Neural networks | 04 | 10 |

**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) | 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 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 |
| 9. | Character recognition application using python. | 02 |
| 10. | NLP application using python. | 02 |

**Reference Books for AI:**

| 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 links:**

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

**Practical:**

- Continuous Evaluation Consist of Performance of Practical which should be evaluated out of 10 for each practical and average of the same will be converted to 10 Marks.
- Internal Viva component 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

- 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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## Center for Skill Enhancement and Professional Development

Course Code: SEPD4010
Course Name: Creativity, Problem Solving & Innovation

**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 | 00 | 03 | 100 | 00 | 00 | 00 | 00 | 00 | 100 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- achieve expertise with the technicalities of creativity and problem solving.
- advance an assertiveness for innovation.
- advance creative thinking skills using shaft of learning components leading to understanding of plans of creativity, problem solving and innovation
- discuss uses of the concepts of creativity and problem-solving skills in personal, social, academic, and profession life.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction to Creativity, Problem Solving and Innovation**<br>• Definitions of Problem Solving, Creativity and Innovation<br>• Need for Problem Solving and Innovation & Scope of Creativity<br>• Types and Styles of Thinking<br>• Strategies to Develop Creativity, Problem Solving and Innovation Skills | 08 | 17 |
| 2. | **Questioning and Learning**<br>• Introduction to Questioning, Learning and Visualization and its Strategies<br>• Sources and Methods of Questioning and Learning<br>• Finding Perspective, Visualizing thinking<br>• Mind Mapping | 07 | 16 |
| 3. | **Creative Thinking and Problem Solving**<br>• Need of Creative Thinking<br>• Cracking Creativity - Reversals, Reversing Perspective, seeing all sides, Looking in other world,<br>• Finding what you are not looking for and following up<br>• Fishbone Diagram<br>• SCAMPER Technique | 08 | 17 |

| Section II | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Logic and Reasoning**<br>• Basic Concept of Logic<br>• Divergent Vs Convergent Thinking, Inductive Vs Deductive Thinking<br>• Fusion of Ideas for Problem Solving<br>• Moral Reasoning<br>• Improvisation | 08 | 17 |
| 2. | **Practices of Playing**<br>• Collaboration and Brainstorming<br>• The Spirit of Koinonia<br>• QFT Model<br>• Connecting the Unconnected<br>• Making Novel Combinations | 07 | 16 |
| 3. | **Review Strategies for Creative problem-solving methods**<br>• A Heuristic Technique<br>• Problem-Solving Strategies: Why Bother?<br>• Five Building Blocks as per Fogler & LeBlanc<br>• Strategy for Critical Thinking for Choosing<br>• Lateral Thinking<br>• Six Thinking Hats by Edward De Bono<br>• Design Thinking | 07 | 17 |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Thinker Toys | Michael Michalko | Random House Publication 2006 |
| Crackling Creativity, The Secrets of Creative Genus | Michael Michalko | Ten Speed Press 2001 |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Zig Zag, The Surprising Path to Greater Creativity | R Keith Sawyer | Jossy-Bass Publication 2013 |
| De Bono's Thinking Course | Edward De Bono | Penguin Publication 1994 |
| Six Thinking Hats | Edward De Bono | Penguin Publication 1999 |
| How to Mind Map | Tony Buzan | Thorsons Publication 2002 |
| The Myths of Innovation | Scott Berkum | Berkun Publication 2010 |
| Creative confidence: Unleashing the creative Potential within Us all | Tom Kelly and David Kelly | William Collins Publication 2013 |
| The all Laughed | Ira Flatow | Harper Publication 1992 |
| The Ultimate Lateral & Critical Thinking Puzzle book | Paul Sloane, Des MacHale & M.A. DiSpezio | Sterling Publication 2002 |

**Course Evaluation:**

| Section | Module No. | Evaluation Criteria | Marks |
|---|---|---|---|
| 1 | 1 | Group Activity on Brainstorming | 15 |
| | 2 | Mind Mapping Activity | 10 |
| | 3 | Chart Preparation on 'Practicality of Fishbone Diagram' | 15 |
| | | Group presentation on 'SCAMPER Technique & its applications' | 10 |
| 2 | 1 | Group Presentation on Critical Analysis of a Govt. scheme/ policy/ budget (merit/ demerit, pros/cons etc) | 15 |
| | 2 | Group Discussion/ Debate/ Elocution | 10 |
| | 3 | Problem Solving Activity (Individual) | 10 |
| | | Presentation (Learning Outcomes) | 15 |
| | | **Grand Total** | **100** |

**Course Outcome(s):**

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

- establish creativity in their day to day actions and educational output.
- solve all types of problems with an optimistic and an impartial attitude.
- reflect innovatively and work towards problem solving in a tactical way.
- initiate different and advanced practices in their selected field of profession.

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## Department of Computer Engineering

Course Code: SECE4523
Course Name: Machine Learning
Prerequisite Course(s): Data Structures (SECE2031), Design and Analysis of Algorithms (SEIT3032), and Mathematical Methods for Computation (SESH2051)

**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

- master the concepts of supervised and unsupervised learning, recommendation engine, and time series modeling.
- implement models such as support vector machines, kernel SVM, naive Bayes, decision tree classifier, random forest classifier, logistic regression, K-means clustering and more in Python.
- comprehend the theoretical concepts and how they relate to the practical aspects of Machine Learning.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No. | Content | Hours | Weightage in % |
| 1. | **Introduction to Artificial Intelligence and Machine Learning**<br>Learning Problems, designing a learning system, Issues with machine learning. Concept Learning, Version Spaces and Candidate Eliminations, Inductive bias. | 04 | 10 |
| 2. | **Supervised learning**<br>Decision Tree Representation, Appropriate problems for Decision tree learning, Algorithm, Hypothesis space search in Decision tree learning, inductive bias in Decision tree learning, Issues in Decision tree learning, Radial Bases, Functions, Case Based Reasoning. | 06 | 20 |
| 3. | **Artificial Neural networks and genetic algorithms**<br>Neural Network Representation, Appropriate problems for Neural Network Learning, Perceptrons, Multilayer Networks | 05 | 20 |

| | | | |
|---|---|---|---|
| | and Back Propagation Algorithms, Remarks on Back Propagation Algorithms.<br>Case Study: face Recognition. | | |
| **Section II** | | | |
| Module No. | Content | Hours | Weightage in % |
| 1. | **Bayesian Learning**<br>Bayes Theorem, Bayes Theorem and Concept Learning, Maximum Likelihood and Least squared Error Hypothesis, Maximum likelihood hypothesis for Predicting probabilities, Minimum Description Length, Principle, Bayes Optimal Classifier, Gibbs Algorithm, Naive Bayes Classifier.<br>Case Study: Learning to classify text. | 06 | 20 |
| 2. | **Unsupervised learning**<br>Unsupervised learning, Applications, challenges, K- Nearest Neighbor Learning Locally Weighted Regression, SVM, Apriori Algorithm, EM Algorithm. | 05 | 20 |
| 3. | **Overview**<br>Typical application areas, such as Recommender System. | 04 | 10 |

**List of Practical:**

| Sr. No. | Name of Practical | Hours |
|---|---|---|
| 1. | Introduction | 02 |
| 2. | Classifying with distance measures | 02 |
| 3. | Constructing Decision trees | 02 |
| 4. | Classification using Decision Trees | 02 |
| 5. | K-means | 02 |
| 6. | Classification with k-Nearest Neighbors | 02 |
| 7. | Random Forest | 02 |
| 8. | Support vector machines | 02 |
| 9. | Expectation Maximization | 02 |
| 10. | Page Rank | 04 |
| 11. | Naive Bayes Classification | 04 |
| 12. | CART | 04 |

**Text Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Machine Learning | Tom M Mitchell | McGraw Hill |

**Reference Book(s):**

| Title | Author/s | Publication |
|---|---|---|
| Pattern Recognition and Machine Learning | Christopher Bishop | Springer-Verlag New York Inc. |
| Real-World Machine Learning | Henrik Brink, Joseph Richards, Mark Fetherolf | DreamTech |
| Machine Learning in Action | Peter Harrington | DreamTech |

**Web Material Link(s):**

- https://nptel.ac.in/courses/106/105/106105152/
- https://in.mathworks.com/campaigns/offers/machine-learning-with-matlab.html?gclid=EAIaIQobChMIrv2dqpOh5wIVkoiPCh0t9g8CEAAYASAAEgKl-fD_BwE&ef_id=EAIaIQobChMIrv2dqpOh5wIVkoiPCh0t9g8CEAAYASAAEgKl-fD_BwE:G:s&s_kwcid=AL!8664!3!281794527296!b!!g!!%2Bmachine%20%2Blearning&s_eid=psn_57384022552&q=+machine%20+learning
- https://wqu.org/programs/datascience/?utm_source=datawrkz&utm_medium=search&utm_campaign=datascience&gclid=EAIaIQobChMIr_TK5ZOh5wIVzQorCh0YdQBvEAAYASAAEgLb5PD_BwE

**Course Evaluation:**

**Theory:**

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, and average at 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 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

- Learn the concept of Machine learning and range of problems that can be solved by machine learning.
- Compare different types of learning algorithms and apply machine learning concepts in real life problems.

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## Department of Information Technology

Course Code: SEIT4521
Course Name: Blockchain Technology
Course Prerequisite(s): Data Structures (SECE2031)

**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 the learners to

- understand blockchain and its applications.
- analyze IBM's strategy in blockchain platform.
- understand security in blockchain based networks.

**Course Content:**

| **Section I** | | | |
|---|---|---|---|
| Module No | Content | Hours | Weightage in % |
| 1. | **Introduction to Blockchain**<br>Blockchain types, Public key cryptography, Hashing, Digital Signature, Business networks, Assets, Ledgers, Transactions and Contracts, the problem with existing networks, how blockchain solves this problem, Requirements of a blockchain for business. | 05 | 10 |
| 2. | **Blockchain Networks**<br>Overview of active networks, TradeLens - Improving global trade, IBM Food Trust - Supply Chain Transparency, IBM World Wire - Global Payments, Decentralised and Trusted Identity, Further Examples by Industry, Key Players for Blockchain Adoption | 05 | 20 |
| 3. | **IBM and Blockchain**<br>How IBM can help with a Blockchain Project, IBM's Blockchain strategy, the IBM Blockchain Platform, The Linux Foundation's Hyperledger Project, Hyperledger Fabric, Continuing your Blockchain Journey | 05 | 20 |

| Section II | | | |
|---|---|---|---|
| Module No | Content | Hours | Weightage in % |
| 1 | **Blockchain composed**<br>What is Hyperledger Composer, Components and Structure of Composer, An example Business Network: Car Auction Market, Extensive, Familiar, Open Tool Set | 05 | 10 |
| 2. | **Blockchain fabric development**<br>Participants and Components Overview, Developer Considerations | 05 | 20 |
| 3. | **Blockchain architecture**<br>Administrator (operator) Considerations, Security: Public vs. Private Blockchains, Architect Considerations, Network Consensus Considerations | 05 | 20 |

**List of Practical:**

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

**Text Book:**

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

**Reference Book:**

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

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

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

**Practical:**

- Continuous Evaluation consists of performance of practical, which should be evaluated out of 10 per each practical. At the end of the semester, average of the entire practical will be converted to 10 Marks.
- Internal Viva consists of 10 marks.
- Practical performance/quiz/test of 15 Marks during End Semester Exam.
- Viva/Oral performance of 15 Marks during End Semester Exam.

**Course Outcome(s):**

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

- understand blockchain and its applications.
- create their own Hyperledger composer solution.
- create their own Blockchain application.
- build their own network.

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## Department of Information Technology

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

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 02 | 02 | 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**<br>Overview of Cyber Security, Internet Governance – Challenges and Constraints, Cyber Threats: - Cyber Warfare-Cyber Crime-Cyber Terrorism-Cyber Espionage, need for a Comprehensive Cyber Security Policy, need for a Nodal Authority, Need for an International convention on Cyberspace, Security Standards. | 03 | 10 |
| 2. | **Cyber Security Vulnerabilities and Cyber Security Safeguards**<br>Cyber Security Vulnerabilities-Overview, vulnerabilities in Software, System Administration, Complex Network Architectures, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness, Cyber Security Safeguards-Overview, Access Control, Audit, Authentication, Biometrics, Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection System, Response, Scanning, Security Policy, Threat Management | 06 | 20 |

| | | | |
|---|---|---|---|
| 3. | **Securing Web Application, Services and Servers**<br>Introduction, Basic security for HTTP Applications and Services, Basic Security for SOAP Services, Identity Management and Web Services, Authorization Patterns, Security Considerations, Challenges | 03 | 10 |
| 4. | **Intrusion Detection and Prevention**<br>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**<br>Introduction to Cryptography, Symmetric key Cryptography, Asymmetric key Cryptography, Message Authentication, Digital Signatures, Applications of Cryptography. Overview of Firewalls- Types of Firewalls, User Management, VPN Security Security Protocols: - security at the Application Layer- PGP and S/MIME, Security at Transport Layer- SSL and TLS, Security at Network Layer-IPSec | 05 | 17 |
| 2. | **Cyberspace and the Law**<br>Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2013 | 05 | 17 |
| 3. | **Cyber Forensics**<br>Introduction to Cyber Forensics, Handling Preliminary analysis, Investigating Investigations, Controlling an Investigation, conducting disk-based Information-hiding, Scrutinizing E-mail, Validating E-mail Header information, Tracing Internet access, Tracing Memory in real-time. | 05 | 16 |

**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. | Write a program to create and simulate an attack. Then explain how to avoid it. | 6 |

**Text Book(s):**

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

**Reference Book(s):**

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

**Web Material Link(s):**

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

**Course Evaluation:**

**Theory:**

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

**Practical:**

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

**Course Outcome(s):**

After 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**
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**Department of Computer Engineering**

Course Code: SEIT4541
Course Name: Automata Theory & Language Processor
Prerequisite Course(s): Discrete Mathematics (SESH2040)

**Teaching & Examination Scheme:**

| Teaching Scheme (Hours/Week) | | | | Examination Scheme (Marks) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Theory | Practical | Tutorial | Credit | Theory | | Practical | | Tutorial | | Total |
| | | | | CE | ESE | CE | ESE | CE | ESE | |
| 02 | 00 | 01 | 03 | 40 | 60 | 00 | 00 | 50 | 00 | 150 |

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand 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**<br>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**<br>Introduction to Transition systems, Description of Finite Automata, String acceptability by Finite Automata, Construction of NFA, NFA with $\in$- moves, The Equivalence between DFA, NFA and $\in$-NFA, Minimization of FA, Finite Automata with output- Moore and Mealy Models. | 06 | 20 |
| 3. | **Regular Expression and Regular Language**<br>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 % |
| 1. | **Grammar:**<br>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<br>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. | 07 | 25 |
| 2. | **Push Down Automata**<br>Definition, Description of PDA, Acceptance by PDA, Operations on PDA, Construction of PDA, Equivalence between CFG and PDA, Deterministic PDA and Non-Deterministic PDA.<br>**Turing Machine**<br>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. | 08 | 25 |

**List of Tutorial:**

| Sr No | Name of Tutorial | Hours |
|---|---|---|
| 1. | Problems based on proofs | 01 |
| 2. | Problems based on identify the class language | 01 |
| 3. | Problems based on DFA | 01 |
| 4. | Problems based on minimal state automata | 01 |
| 5. | Problems based on finite automata | 01 |
| 6. | Problems based on Moore and Mealy machine | 01 |
| 7. | Problems based on regular expressions and regular sets | 01 |
| 8. | Problems based on pumping lemma | 01 |
| 9. | Problems based on closure property | 01 |
| 10. | Problems based on CNF and GNF | 01 |
| 11. | Problems based on context-free grammar and language | 01 |
| 12. | Problems based on PDA | 01 |
| 13. | Problems based on TM | 01 |
| 14. | Problems based on decidability | 01 |
| 15. | Problems based on string/language validity | 01 |

**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.

**Tutorial:**

- Continuous Evaluation Consist of Performance of tutorial which should be evaluated out of 10 for each tutorial and average of the same will be converted to 50 Marks.

**Course Outcome(s):**

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

- acquire a fundamental understanding of the core concepts in automata theory and formal languages.
- design grammars and automata (recognizers) for different language classes.
- identify formal language classes and prove language membership properties.
- apply this basic knowledge of Theory of Computation in the computer field to solve computational problems.



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