FACULTY OF ENGINEERING

Scheme of Instructions & Detailed Syllabus of III & IV Semester

For

Four Year Degree Programme of Bachelor of Engineering

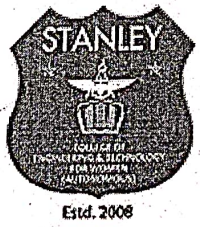
(B.E)

in

INFORMATION TECHNOLOGY

(With effect from the academic year 2024-25)
(Approved by College Academic Council on -- -- ----)

Empower Women – Impact the World



Stanley College of Engineering and Technology for Women (Autonomous)
(Affiliated to Osmania University)
(Accredited by NAAC with "A" Grade)
Abids, Hyderabad – 500 001, Telangana.

B. E . 4 Year (8 semesters) Regular Programme in INFORMATION TECHNOLOGY

Course Structure

(Applicable for the Batch admitted from the Academic Year 2023-24)

Semester III

S. No	Code	Course Title	Scheme of Instruction				Scheme of Examination			Credits
			L	T	D/P	CONTACT HOURS	CIE	SEE	DURATION IN HOURS	CREDITS
Theory Courses										
1	SPC301IT	Discrete Mathematics & Graph Theory	3			3	40	60	3	3
2	SPC302IT	OOPS Using JAVA	3			3	40	60	3	3
3	SPC303IT	Database Management Systems	3			3	40	60	3	3
4	ES301EC	Digital Electronics	3			3	40	60	3	3
5	SPC304IT	Computer Architecture and Organization	3			3	40	60	3	3
6	SAU903CH	Environmental Science	2			2	40	60	2	0
Practical/Laboratory Courses										
7	SPC311IT	OOPS using Java Lab			2	2	40	60	3	1
8	SPC312IT	Database Management Systems Lab			2	2	40	60	3	1
9	ES312EC	Digital Electronics Lab			2	2	40	60	3	1
10	SPC313IT	IT Work Shop			2	2	40	60	3	1
			17		**8**	**25**	**400**	**600**	**29**	**19**

1. Prof. K Syamala (University Nominee)

2. Prof. Uma N Dulhare (Subject Expert)

3. Mr. Bala Prasad P (Industry Expert)

4. Dr. Srinivasu B (Chairperson-BOS)

Course Code	Course Title						Core/Elective
SPC301IT	DISCRETE MATHEMATICS & GRAPH THEORY						Core
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
-	3	-	-	-	40	60	3

Course Objectives: This course aims to:

1. Introduce Propositional and Predicate Logic
2. Introduce various proof techniques for validation of arguments
3. Develop an understanding of counting, functions and relations and Familiarize with fundamental notions and applicability of graph theory and algebraic systems

Course Outcomes : After completion of the course, the students should be able to

1. Describe rules of inference for Propositional and Predicate logic.
2. Demonstrate use of Set Theory, Venn Diagrams, and relations in Real-world scenarios.
3. Model solutions using Generating Functions and Recurrence Relations.
4. Determine the properties of graphs and trees to solve problems arising in computer science applications.
5. Distinguish between groups, semi groups and monoids

UNIT–I:

Introduction to Propositional Calculus: Basic Connectives and Truth tables, Logical Equivalence: Laws of Logic, Logical Implication; Rules of Inference. Predicates: The Use of Quantifiers, Quantifiers, Definitions and the Proofs of Theorems.

UNIT– II:

Sets: Sets and Subsets, Operations on sets and the Laws of Set Theory, Counting and Venn Diagrams. Relations: Cartesian Products and Relations. Partial ordering relations, POSET, Hasse diagrams, Lattices as Partially Ordered Sets, Equivalence relations. Pigeon hole principle.

UNIT – III:

Generating Functions: Generating Functions, Calculating Coefficient of generating functions. Recurrence Relations: The First Order Linear Recurrence Relation, Second Order Linear. Homogeneous Recurrence relations with constant coefficients, Non Homogeneous Recurrence relations.

UNIT – IV:

Introduction to Graphs: Graphs and their basic properties- degree, path, cycle, Sub graphs, Complements and Graph Isomorphism, Euler trails and circuits, Hamiltonian paths and cycles, planar graphs, Euler formula, Graph Coloring. Trees: Definitions, Properties, Spanning Trees, Minimum Spanning trees: The Algorithms of Kruskal and Prims

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UNIT – V:

Definition and elementary properties of groups, Semigroups, Monoids, Rings, Fields, Vector spaces and lattices, Introduction, Discrete random variables, Applications to Binary Search Tree.

Text Books:

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, 7th Edition, Tata McGraw Hill Publishers.
2. S.B. Singh, Discrete Structures/ 3rd Edition, Khanna Book Publishing, 2019.
3. S.B. Singh, Combinatorics and Graph Theory/ 3rd Edition, Khanna Book Publishing, 2018.
4. C. L. Liu, Elements of Discrete Mathematics, 2nd Edn., Tata McGraw-Hill 2000.

Reference Books:

1. J .L. Mott, A. Kandel, T.P .Baker, Discrete Mathematics for Computer Scientists and Mathematicians, Second edition, Prentice Hall of India 1986.
2. W. K. Grassmann and J. P. Trembnlay, Logic and Discrete Mathematics, A Computer Science Perspective, Prentice Hall Inc 1996

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Course Code	Course Title						Core / Elective
SPC302IT	OOPS Using JAVA (Common to AI & DS, AI&ML,CSE ,IT, CME)						Core
Prerequisite	Contact hours per week				CIE	SEE	Credits
	L	T	D	P			
SES101CS	3	–	–	–	40	60	3

Course Objectives:

1. To understand fundamentals of object-oriented programming in Java and create Java application programs using core concepts of OOP like interfaces, exception handling, multithreading, polymorphism, packages.
2. Use I/O streams for Input output operations in various streams and also perform serialization.
3. Explore Collection framework and also design GUI application with different layout managers with event handling.

Course Outcomes: At the end of this course, the student will be able to

1. Understand the concepts of classes, objects, and polymorphism.
2. Apply concepts of interfaces, user-defined packages during application development.
3. Develop Java Applications using Exception Handling and Multithreading concepts.
4. Compose programs using the Java Collection API.
5. Design GUI Application with Event Handling & Layout Designing concepts

UNIT-I:

Introduction: OOP concepts, benefits of OOP, history of Java, data types, variables, scope and life time of variables, operators, expressions, control statements, type conversion and casting.

Classes and Objects: Concept of classes, objects, constructors, methods, this keyword, super keyword, garbage collection, overloading methods and constructors, parameter passing; Arrays

String handling: String, String Buffer, String Builder

UNIT –II:

Inheritance: Base class object, subclass, member access rules, super uses, using final with inheritance, method overriding, abstract classes.

Interfaces: Defining and implementing an interface, differences between classes and interfaces and extending interfaces Polymorphism.

Packages: Defining, creating and accessing a package, importing packages, exploring packages

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UNIT – III:

Exception handling: Concepts and benefits of exception handling, exception hierarchy, checked and unchecked exceptions, usage of-try, catch, throw, throws and finally, built in exceptions, creating User defined exceptions.

Multithreading: Difference between multi-threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

UNIT – IV:

Basic I/O Streams: Java I/O classes and interfaces, Files, Stream and Byte classes, Character streams, Serialization Exploring java.lang: Object class, Wrapper classes Exploring

java.util: Scanner, StringTokenizer.

Collections: Overview of Java Collection frame work, commonly used Collection classes-Array List, Linked List, Hash Set, Tree Set, Collection Interfaces – Collection, List, Set. Accessing Collection via iterator, working with Map.

UNIT –V:

GUI Programming with Java: The AWT class hierarchy, MVC architecture.

Exploring Swing: JLabel, ImageIcon, JTextField, the Swing buttons, Jtabbedpane, JScrollPane, JList, JComboBox.

Layout manager: Border, Grid, Flow, Card and Grid Bag Layouts.

Event Handling: Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces, Handling mouse and keyboard events, Adapter classes.

New Features in Java: Major enhancement made in Java5, Java6, Java7 and Java8 like auto-boxing, generics, var-args, java annotations, enum, lambda expressions, functional interface, method references..

Text Books:

1. Schildt and Herbert, Java The complete reference, McGraw, 9th Edition, TMH.
2. E. Balagurusamy, Programming with Java, seventh edition, Tata McGraw Hill.
3. H. M. Dietel and P. J. Dietel, Java How to Program, Sixth Edition, Pearson Education /PH
4. James M Slack, Programming and Problem Solving with JAVA, Thomson Learning, 2002.

References Books:

1. Dr R. Nageswara Rao, Core Java: An Integrated Approach, Dreamtech.
2. Prem Kumar, Getting Inside Java - Beginners Guide: Programming with Java, Notion Press.
3. Bert Bates, Kathy, Head First Java, Sierra Publisher: Reilly Media, Inc, 2nd Edition.
4. T. Budd, An Introduction to OOP, Pearson Education, Second Edition.

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Course Code	Course Title						Core/Elective
SPC303IT	DATABASE MANAGEMENT SYSTEMS (Common to AI & DS, AI&ML,CSE ,IT, CME)						Core
Prerequisite	Contact hours per week				CIE	SEE	Credits
	L	T	D	P			
-	3	–	–	–	40	60	3

Course Objectives:

1. Understand the basic concepts and the applications of database systems.
2. Master the basics of SQL and construct queries using SQL.
3. Understand the relational database design principles and Become familiar with the basic issues of transaction processing and concurrency control, database storage structure and recovery mechanisms

Course Outcomes: At the end of this course, the student will be able to:

1. Understand concepts and the applications of database systems and implement in real time applications.
2. Construct an Entity-Relationship (E-R) model from specifications and transform to relational model.
3. Demonstrate the concepts of relational database management system
4. Apply normalization on database.
5. Understand principles of database transaction management, storage and recovery of database.

UNIT 1:

Introduction: Database System Applications, Purpose of Database Systems, View of Data,

Database Languages: DDL, DML, Relational Databases, Data Storage and Querying, Transaction Management, Database Architecture, Database Users and Administrators.

Introduction to the Relational Model: Structure of Relational Databases, Database Schema, Schema Diagrams and Relational Algebra.

UNIT 2:

Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Integrity Constraints, Set Operations, Null Values, Aggregate Functions, Nested Sub queries

Advanced SQL: Join Expressions, Views, Triggers, Cursors, Procedures and Functions.

UNIT 3:

Database Design and the E-R Model: The Entity- Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity-Relationship Diagrams, Reduction to Relational schemas, Entity-Relationship Design Issues, Extended E-R Features.

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Normalization: Functional Dependencies, Lossless decomposition, 1NF, 2NF, 3NF, Dependency Preservation, BCNF, Multi -valued dependencies, 4NF, Denormalization

UNIT 4:

Indexing: Sparse index, dense index, B tree and B+ trees.

File Structures: Sequential files.

Transaction Management: Transaction Concept, Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity, Transaction Isolation Levels.

UNIT 5:

Concurrency Control: Lock-Based Protocols, Multiple Granularity, Timestamp-Based Protocols, Validation-Based Protocols.

Backup and Recovery System: Failure Classification, Storage, Recovery and Atomicity,

Overview and History of NoSQL Databases: Definition , Tpes of NoSQL Database

Text Books:

1. A. Silberschatz, Henry. F. Korth and S. Sudarshan, Database System Concepts, 6th Edition, McGraw Hill Education (India) Private Limited.
2. C. J. Date, A. Kannan, and S. Swami Nadhan, An Introduction to Database systems, 8th Edition, Pearson Education.

Reference Books:

1. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, 3rd Edition, McGraw Hill Education (India) Private Limited.
2. R Elmasri, Shamkant B. Navathe, Database Systems, 6th Edition, Pearson Education.

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Course Code	Course Title						Core/Elective
SES0301EC	Digital Electronics (for III Sem. AI&DS and IT)						Core
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
	3	-	-	-	40	60	3

Course Objectives:

1. To describe the principles of digital logic gates.
2. To explain the working of combinational and arithmetic logic circuits.
3. To illustrate hardware design for real world problems.
4. To give insights of the basic knowledge of programmable logic devices.
5. To describe various sequential circuits.

Course Outcome: On successful completion of the course, the students will be able to

1. Understand the optimized implementation of logical functions.
2. Understand the number representation and design combinational circuits like adders, MUX etc.
3. Design Combinational circuits using PLDs and write Verilog HDL code for basic gates and combinational circuits.
4. Analyze sequential circuits using flip-flops and design counters.
5. Represent a sequential circuit using Finite State machine and apply state minimization techniques to design a FSM

UNIT – I

Design Concepts: Introduction to logic circuits – Variables and functions, Logic gates, Boolean algebra, Optimized implementation of logic functions using K-Map up to 5 Variable maps and Quine-Mc Cluskey Tabular method

UNIT – II

Number representation: Addition and Subtraction of signed and unsigned numbers.

Combinational circuit building blocks: Adders and Subtractors, Multiplexers. Demultiplexers, Parity Checkers and Generators, Decoders, Encoders. Code converters, BCD to 7-segment converter, Arithmetic comparator circuits.

UNIT – III

Design of combinational circuits using Programmable Logic Devices: General structure of a Programmable Array Logic, Programmable Logic Arrays, Structure of CPLDs and FPGAs.

UNIT – IV

Sequential Circuits: Basic Latch, Gated SR Latch, gated D Latch, Master-Slave edge triggered flip-flops, T Flip-flop, JK Flip-flop, Excitation tables, Counters.

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UNIT – V

Synchronous Sequential Circuits: Basic Design Steps, Finite State Machine representation using Moore and Mealy state models, State minimization, Algorithmic State Machine charts.

Reference Books:

1. Moris Mano and Michael D Ciletti, Digital Design, Pearson, fourth edition,2008
2. Zvi Kohavi, Switching and Finite Automata Theory, 3rd ed., Cambridge University Press-New Delhi, 2011.
3. R. P Jain, Modern Digital Electronics,4th ed., McGraw Hill Education (India) Private Limited, 2003

Suggested Readings:

1. Ronald J.Tocci, Neal S. Widmer & Gregory L. Moss, "Digital Systems: Principles and Applications," PHI, 10/e, 2009.
2. Samir Palnitkar, Verilog HDL: A guide to digital design and Synthesisl, Pearson, 2nd edition, 2015.

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Dept. of Electronics & Commn. Engg
Osmania University

Course Code	Course Title						Core/Elective
SPC304IT	COMPUTER ORGANIZATION AND ARCHITECTURE						Core
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
-	3	-	-	-	40	60	3

Course Objectives: The students will try to learn:

1. Understand the organization and architecture of computer systems and electronic computers and Study the assembly language program execution, instruction format and instruction cycle.
2. Design a simple computer using hardwired and micro-programmed control methods and Study the basic components of computer systems besides the computer arithmetic.
3. Understand input-output organization, memory organization and management, and pipelining.

Course Outcomes: After successful completion of the course, students should be able to:

1. Understanding of components in a computer system with functional units and levels of programming languages.
2. Demonstrate the implementation of micro-operations with the help of register transfer language and electronic circuits.
3. Identify appropriate addressing modes for specifying the location of an operand.
4. Interpret the design of hardwired and micro-programmed control unit for execution of micro programs.
5. Summarize the concepts of pipelining and interprocess communication for advanced processor design.

UNIT I:

Basic computer organization, CPU organization, memory subsystem organization and interfacing, input or output subsystem organization and interfacing, a simple computer levels of programming languages, assembly language instructions, instruction set architecture design, a simple instruction set architecture.

UNIT – II

Register transfer: Register transfer language, register transfer, bus and memory transfers, arithmetic micro operations, logic micro operations, shift micro operations; Control unit: Control memory, address sequencing, micro program example, and design of control unit.

UNIT - III

CPU design: Instruction cycle, data representation, memory reference instructions, input-output, and interrupt, addressing modes, data transfer and manipulation, program control.
Computer arithmetic: Addition and subtraction, floating point arithmetic operations, decimal arithmetic unit.

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UNIT – IV

Memory organization: Memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, virtual memory; Input or output organization: Input or output Interface, asynchronous data transfer, modes of transfer, priority interrupt, direct memory access.

UNIT - V

Pipeline: Parallel processing, pipelining-arithmetic pipeline, instruction pipeline; Multiprocessors: Characteristics of multiprocessors, inter connection structures, inter processor arbitration, inter processor communication and synchronization.

Text Books

1. M. Morris Mano, "Computer Systems Architecture", Pearson, 3 rd Edition, 2015.
2. John D. Carpinelli, "Computer Systems Organization and Architecture", Pearson, 1st Edition, 2001.
3. Patterson, Hennessy, "Computer Organization and Design: The Hardware/Software Interface", Morgan Kaufmann, 5th Edition, 2013.

Reference Books

1. John. P. Hayes, "Computer System Architecture", McGraw-Hill, 3rd Edition, 1998.
2. Carl Hamacher, Zvonko G Vranesic, Safwat G Zaky, "Computer Organization", McGraw-Hill, 5th Edition, 2002.
3. William Stallings, "Computer Organization and Architecture", Pearson Edition, 8th Edition, 2010.

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SEMESTER IV

AU 2020	Environmental Science	3L:0T:0P	0 Credits

Course Objective: People working in industries or elsewhere essentially require the knowledge of environmental science so as to enable them to work and produce most efficient, economical and eco-friendly finished products.

- Solve various engineering problems applying ecosystem to produce eco – friendly products.
- Use relevant air and noise control method to solve domestic and industrial problems.
- Use relevant water and soil control method to solve domestic and industrial problems.
- To recognize relevant energy sources required for domestic and industrial applications.
- Solve local solid and e-waste problems.

Course Content:

Unit-1: Ecosystem

- Structure of ecosystem, Biotic & Abiotic components.
- Food chain and food web.
- Aquatic (Lentic and Lotic) and terrestrial ecosystem.
- Carbon, Nitrogen, Sulphur, Phosphorus cycle.
- Global warming -Causes, effects, process, Green House Effect, Ozone depletion.

Unit–2: Air and, Noise Pollution

- Definition of pollution and pollutant, Natural and manmade sources of air pollution (Refrigerants, I.C., Boiler).
- Air Pollutants: Types, Particulate Pollutants: Effects and control (Bag filter, Cyclone separator, Electrostatic Precipitator).
- Gaseous Pollution Control: Absorber, Catalytic Converter, Effects of air pollution due to Refrigerants, I.C., Boiler.
- Noise pollution: sources of pollution, measurement of pollution level, Effects of Noise pollution, Noise pollution (Regulation and Control) Rules, 2000.

Unit-3: Water and Soil Pollution

- Sources of water pollution, Types of water pollutants, Characteristics of water pollutants Turbidity, pH, total suspended solids, total solids BOD and COD: Definition, calculation.
- Waste Water Treatment: Primary methods: sedimentation, froth floatation, Secondary methods: Activated sludge treatment, Trickling filter, Bioreactor, Tertiary Method: Membrane separation technology, RO (reverse osmosis).
- Causes, Effects and Preventive measures of Soil Pollution: Causes-Excessive use of Fertilizers, Pesticides and Insecticides, Irrigation, E-Waste.

Unit– 4: Renewable sources of Energy

- Solar Energy: Basics of Solar energy. Flat plate collector (Liquid & Air). Theory of flat plate collector. Importance of coating. Advanced collector. Solar pond. Solar water heater, solar dryer. Solar stills.
- Biomass: Overview of biomass as energy source. Thermal characteristics of biomass as fuel. Anaerobic digestion. Biogas production mechanism. Utilization and storage of biogas.
- Wind energy: Current status and future prospects of wind energy. Wind energy in India. Environmental benefits and problem of wind energy.
- New Energy Sources: Need of new sources. Different types new energy sources. Applications of (Hydrogen energy, Ocean energy resources, Tidal energy conversion.) Concept, origin and power plants of geothermal energy.

Unit-5: Solid Waste Management, ISO 14000 & Environmental Management

- Solid waste generation- Sources and characteristics of: Municipal solid waste, E- waste, biomedical waste.
- Metallic wastes and Non-Metallic wastes (lubricants, plastics, rubber) from industries. Collection and disposal: MSW (3R, principles, energy recovery, sanitary landfill), Hazardous waste.
- Air quality act 2004, air pollution control act 1981 and water pollution and control act1996. Structure and role of Central and state pollution control board.
- Concept of Carbon Credit, Carbon Footprint.
- Environmental management in fabrication industry.
- ISO14000: Implementation in industries, Benefits.

Text Books/References:

1. S.C. Sharma & M.P. Poonia, Environmental Studies, Khanna Publishing House, New Delhi.
2. C.N. R. Rao, Understanding Chemistry, Universities Press (India) Pvt. Ltd., 2011.
3. Arceivala, Soli Asolekar, Shyam, Waste Water Treatment for Pollution Control and
4. Reuse, Mc-Graw Hill Education India Pvt. Ltd., New York, 2007, ISBN:978-07-062099-
5. Nazaroff, William, Cohen, Lisa, Environmental Engineering Science, Willy, New York, 2000, ISBN 10: 0471144940.
6. O.P. Gupta, Elements of Environmental Pollution Control, Khanna Publishing House, New Delhi
7. Rao, C. S., Environmental Pollution Control and Engineering, New Age International Publication, 2007, ISBN: 81-224-1835-X.
8. Rao, M. N.Rao, H.V.N, Air Pollution, Tata Mc-Graw Hill Publication, New delhi, 1988, ISBN: 0-07- 451871-8.
9. Frank Kreith, Jan F Kreider, Principles of Solar Engineering, McGraw-Hill, New York; 1978, ISBN: 9780070354760.
10. Aldo Vieira, Da Rosa, Fundamentals of renewable energy processes, Academic Press Oxford, UK; 2013. ISBN: 9780123978257.
11. Patvardhan, A.D, Industrial Solid Waste, Teri Press, New Delhi, 2013, ISBN:978-81-7993-502-6
12. Metcalf & Eddy, Waste Water Engineering, Mc-Graw Hill, New York, 2013, ISBN: 077441206.
13. Keshav Kant, Air Pollution & Control, Khanna Publishing House, New Delhi (Edition 2018)

11. To implement collection class concept Linked List.
12. To implement collection class concept Tree map.
13. To implement collection class concept Hash map.
14. To execute iteration over Collection using Iterator interface and List Iterator Interface.
15. To read a file name from the user, and display information about whether the file is exists, whether is the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
16. To copy contents of one file into another file using command line arguments (simulation of copy command).
17. To implement serialization concept.
18. To implement event handler concept using mouse and key board events.
19. To design a simple application using swings, layout, event handling (basic calculator or sign in screen or billing screen etc.)

Text Books:

1. Schildt and Herbert, Java The complete reference, McGraw, 9th edition, TMH.
2. E. Balagurusamy, Programming with Java, seventh edition, Tata McGraw Hill.
3. H. M. Dietel and P. J. Dietel, Java How to Program, Sixth Edition, Pearson Education.
4. James M Slack, Programming and Problem Solving with JAVA, Thomson Learning, 2002.

References Books:

1. Dr R. Nageswara Rao, Core Java: An Integrated Approach, dreamtech.
2. Prem Kumar, Getting Inside Java - Beginners Guide: Programming with Java, Notion Press.
3. Bert Bates, Kathy, Head First Java, Sierra Publisher, Reilly Media, Inc, 2nd Edition.
4. T. Budd, An Introduction to OOP, Pearson Education, second edition.

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Course Code	Course Title						Core / Elective
SPC312IT	DATABASE MANAGEMENT SYSTEMS LAB (Common to AI & DS, AI&ML, CSE, IT , CME)						Core
	Contact Hours per Week				CIE	SEE	Credits
Pre Requisite	L	T	D	P			
-	-	-	-	2	40	60	1

Course Objectives:

1. Demonstrate SQL constructs to develop a database application.

Course Outcomes: On completion of the course, students will be able to

1. Design and implement a database schema.
2. Implement queries using SQL commands
3. Develop application programs using Advanced SQL.
4. Develop a 2-tier Database Application

Lists of Experiments:

1. Introduction to MySQL &Installation of MySql ,
2. Creating Database/ Table Space
   - Managing Users: - Create User, Delete User
   - Managing Passwords
   - Managing roles: - Grant, Revoke
3. Practicing DDL commands without constraints
4. Data insertion, update/modification/Delete and retrieval through MySQL. Basic SQL structure. Query implementation
5. Enforcing integrity constraints (Domain, Key constraints (Primary/Foreign keys), NOT NULL, UNIQUE, DEFAULT, Check)
6. Creating and updating View. Query implementation using View
7. Query optimization through Nested Query (Use of logical connectives, set comparison operators, Union, Intersect, Except, Exists clauses)
8. Querying using aggregate functions COUNT, SUM using GROUPBY and HAVING.
9. Use of Join operator (Natural join, Outer join (left, right and full)
10. Procedures and Stored Procedures Creation, Execution and Modification of stored Procedure
11. Implementation of Triggers.
12. Implementation of Cursors.
13. Index creation through SQL(create index in MYSQL ,View index ,Change ordering of index key, Compare time taken to search with and without using index)
14. Implementation of Database Backup & Recovery Commands
    TCL Commands: Rollback, Commit, Save point.

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DCL Commands: Grant and Revoke

15. CASE STUDIES
    a) Student Information System
    b) Airline flight information
    c) Bus reservation System.

Note: For the given case studies design an E-R Model and Relation Model.

16. Creation of small fully fledged database application (Insertion,Updation, Deletion, Displaying of Data) for any one of the above mentioned case study.

Text Books:

1. Vikram Vaswani, The Complete Reference MySQL, 1st Edition, McGraw Hill Education (India) Private Limited.

2. Joan Casteel, Oracle 10 g: SQL, 1st Edition, Thomson Course Technology.

Reference Books:

1. A. Silberschatz, Henry. F. Korth and S. Sudarshan, Database System Concepts, 6th Edition, McGraw Hill Education (India) Private Limited.

2. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, 3rd Edition, McGraw Hill Education (India) Private Limited.

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Course Code	Course Title						Core/Elective
SES0311EC	– Digital Electronics Lab (for III Sem. IT)						Core
Prerequisite	Contact hours per week				CIE	SEE	Credits
	L	T	D	P			
–	–	–	–	2	40	60	1

Course Objectives

1. To discuss verification of combinational and sequential circuits.
2. To describe about design and verification of combinational and sequential circuits.
3. To explain techniques for design and verification of digital circuits using Verilog HDL.
4. To give insights of digital systems and finite state machines.
5. To verify the Verilog codes by writing appropriate test benches.

Course Outcomes: On successful completion of the course, the students will be able to

1. Design and verify the combinational logic circuits.
2. Design and verify the sequential logic circuits.
3. Apply the constructs and conventions of the Verilog HDL programming.
4. Design and analyze digital systems and finite state machines.
5. Perform functional verification by writing appropriate test benches.

List of Experiments:

Cycle-I:

1. Verification of Basic gates using TTL ICs like AND, OR, NOT, EX-OR, NAND and NOR gates
2. Design and verify code convertors using gates
3. Design and verify half adder, full adder using gates
4. Design and verify half subtractor and full subtractor using gates
5. Flip-Flop verification using ICs
6. Design of decade counter

Cycle-II:

1. Design of 4-bit Ripple Carry Adder using Verilog
2. Design of ALU using Verilog
3. Design of encoder and decoder using Verilog
4. Design of synchronous up-down counter using Verilog

Note: Cycle-II should be performed using Vivado 2017.1 / Modelsim software tool.

Suggested Readings:

1. M.Morris Mano & Michael D.Ciletti – Digital Design, Pearson, 5th edition, 2013.
2. Samir Palnitkar -Verilog HDL A guide to digital design and Synthesis, Pearson, 2nd edition, 2015.
3. Digital System Design Laboratory Manual of Stanley College of Engineering and Technology for Women.

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Course Code	Course Title						Core / Elective
SPC313IT	IT WORKSHOP						Core
Prerequisite	Contact hours per week				CIE	SEE	Credits
	L	T	D	P			
–	–	–	–	2	40	60	1

Course Objectives:

1. To extend student's knowledge in basics of computers hardware and Software and to enable students to understand the operating systems Windows /Linux Installation
2. To enable students to understand and practice documentation tools MS Word/ Latex.
3. To enable students understand and practice accounting tools MS Excel

Course Outcomes: At the end of this course, the students will

1. Identify and understand the function of hardware and software components.
2. Install and configure different operating systems (Windows, Linux).
3. Develop skills in creating and maintaining documentation.
4. Designing and developing presentation.
5. Demonstrate and compute the data using Spread Sheet.

List of Experiments:

Week – 1:

1. Identify the peripherals of a computer, components in a CPU and its functions.
2. Draw the block diagram of the CPU along with the configuration of each peripheral.
3. Lab instructors should need to show through the video which shows the process of assembling a PC.

Week – 2:

1. Lab instructors should explain software, Application software and System software and functionality
2. Lab instructors should explain need to explain installation of MS-Windows and Unix/ Linux operating systems.
3. Lab instructors should need to show through the video which shows the process of installation of Window and Unix/Linux operating systems.

Week – 3

1. Student must present poster by describing various hardware compotes and software with applications.
2. Lab instructors should verify the work and follow it up with a Viva

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Week – 4:

1. To create, save, open, edit, and manage documents.
2. To formatting the text including font selection, size, color, and text alignment.
3. To add and customize headers and footers, including page numbers and dates.
4. To insert Bullets and Numbering, Cell alignment, Hyperlink, Symbols, Spell Check.
5. To insert and format tables, formatting table columns, rows and alignment data.
6. To insert, format, and manipulate images, shapes, and other graphics within a document.

Week – 5:

1. Student must create a documentation about computer hardware, software with images
2. Student must design time table for the class work and resume
3. Lab instructors should verify the work and follow it up with a Viva.

Week – 6:

1. To create, save, open, edit, and manage power point presentation.
2. To formatting the presentation including font selection, size, color, and text alignment.
3. To add and customize headers and footers, including page numbers and dates.
4. To insert Bullets and Numbering, Cell alignment, Hyperlink, Symbols, Spell Check.
5. To insert and format tables, formatting table columns, rows and alignment.
6. To insert, format, and manipulate images, shapes, and other graphics within a presentation.

Week – 7:

1. Students must prepare and present power point presentation with 10 slides
2. Lab instructors should verify the work and follow it up with a Viva.

Week – 8:

1. To apply data analysis tools sorting, filtering, conditional formatting, and data validation.
2. To demonstrate how to create and format various types of charts and graphs to visualize data.
3. To introduce the basics of creating and using macros to automate repetitive tasks.
4. To create, save, open, edit and manage Excel workbooks and Worksheets.
5. To enter, edit, and format data efficiently in cells, rows, and columns in Worksheets.
6. To introduce basic formulas and functions for calculations, such as SUM, AVERAGE

Week – 9:

1. Students must prepare Excel workbooks and Worksheets for SSC and Inter marks

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2. Lab instructors should verify the work and follow it up with a Viva

Week -10

1. Libre Office Draw: Introduction, Basic shapes, working with objects, flowcharts, organization charts
2. Students must prepare flowcharts and block diagrams using Draw tool.
3. Lab instructors should verify the work and follow it up with a Viva

Week -11:

1. Create Google form and collect data using google forms. Add fields for collecting data (Roll number, Name, Phone Number, SCC marks, 12 marks, Rank etc)
2. Use various functions in Google Sheets to analyze the data. For example:
   a. Use formulas to calculate averages, standard deviations, etc.
   b. Create charts and graphs to visualize the data.
   c. Apply filters to sort and organize the data.
3. Document the Experiment using Google Docs:

Week -12:

1. Write the report, incorporating data and visualizations from Google Sheets.
2. In Google Docs, insert charts directly from Google Sheets by using the "Insert" -> "Chart" -> "From Sheets" option.
3. This ensures that any updates in Google Sheets are reflected in the Google Docs report.

Text Books:

1. Alan Clements, Principles of Computer Hardware, Oxford University Press India, Fourth Edition, 2013.
2. Vikas Gupta, Comdex Information Technology course tool kit, WILEY Dreamtech
3. Richard Peterson, Linux: The Complete Reference, McGraw Hill Education Sixth Edition, 2017.
4. Dr. S.B. Kishor, Computer Applications(Ms-Office), Das Ganu Prakshan Nagpur(India)

References:

1. Ron White, How Computers Work: The Evolution of Technology, Que Publishing, Tenth Edition, 2014.
2. David Reed, A Balanced Introduction to Computer Science, Pearson, 3rd Edition, 2010.
3. Steven Holzner, The Complete Reference, McGraw Hill Education, 2017.

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