POLYTECHNIC ENGINEERING

Sri Satya Sai University of Technology & Medical Sciences, Sehore (M.P.)

Syllabus of Examination - AICTE Pattern

Undergraduate Diploma Courses in Engineering & Technology

Department of Computer Science and Engineering

Semester-IV

Course Code	DCSA-401
Course Title	Operating System
Number of Credits	3 (L:3; T:0; P:0)

Course Objectives:

A general introduction to various ideas in implementation of operating systems, particularly UNIX. Introduce to various options available so as to develop capacity to compare, contrast, and evaluate the key trade-offs between different design choices.

Course outcomes:

Students should be able to demonstrate basic knowledge about Operating System, be able to apply OS concepts such as processes, memory and file systems to system design, able to configure OS in an efficient and secure manner.

UNIT 1:
Overview of Operating System, basic concepts, UNIX/LINUX Architecture, Kernel, services and systems calls, system programs.

UNIT 2:
Process Management: Process concepts, operations on processes, IPC, Process Scheduling, Multithreaded programming Memory management: Memory allocation, Swapping, Paging, Segmentation, Virtual Memory, various faults.

UNIT 3:
File management: Concept of a file, access methods, directory structure, file system mounting, file sharing and protection, file system structure and implementation, directory implementation, free space management, efficiency and performance. Different types of file systems.

UNIT 4:
I/O System: Mass storage structure - overview, disk structure, disk attachment, disk scheduling algorithms, swap space management, RAID types.

UNIT 5:
OS Security: Authentication, Access Control, Access Rights, System Logs

Reference Books:
1. Operating System Concepts, Silberschatz and Galvin, Wiley India Limited
2. UNIX Concepts and Applications, Sumitabha Das, McGraw-Hill Education
3. Operating Systems, Internals and Design Principles, Stallings, Pearson Education, India
4. Operating System Concepts, Ekta Walia, Khanna Publishing House
5. Modern Operating Systems, Andrew S. Tanenbaum, Prentice Hall of India
6. Operating systems, Deitel & Deitel, Pearson Education, India

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Undergraduate Diploma Courses in Engineering & Technology

Department of Computer Science and Engineering

Semester-IV

Course Code	DCSA-401
Course Title	Operating System lab
Number of Credits	1 (L:0; T:0; P:2)

List of practical to be performed:

1 Revision practice of various commands like man, cp, mv, ln, rm, unlink, mkdir, rmdir, etc and many more that were learnt in IT Workshop course and later.

2 Implement two way process communication using pipes

3 Implement message queue form of IPC

4 Implement shared memory and semaphore form of IPC

5 Simulate the CPU scheduling algorithms - Round Robin, SJF, FCFS, priority

6 Simulate Bankers algorithm for Deadlock Avoidance and Prevention

7 Simulate all FIFO Page Replacement Algorithm using C program

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Undergraduate Diploma Courses in Engineering & Technology

Department of Computer Science and Engineering

Semester-IV

Course Code	DCSA-402
Course Title	Introduction to DBMS
Number of Credits	3 (L:3; T:0; P:0)

Course Objectives:

It covers the development of database-driven applications using the capabilities provided by modern database management system software. The concepts include conceptual modeling, relational database design and database query languages.

Course outcomes:

After completing the course, the students will understand
(i)   how to design a database, database-based applications
(ii)   How to use a DBMS
(iii)   the critical role of database system in designing several information system-based software systems or applications.

UNIT 1:

Introduction; Database System Concepts and Architecture.

UNIT 2 :

Data Modeling using the Entity-Relationship Model; The Enhanced Entity-Relationship (EER) model.

UNIT 3:

The Relational Data Model and Relational Database Constraints; ER/EER to Relational Model mapping; Relational Algebra and Relational Calculus.

UNIT 4:

SQL-99: Schema definition, Constraints, Queries, and Views; Security; Introduction to SQL programming Techniques.

UNIT 5:

Functional dependencies and normalization for relational databases; Relational database design algorithms and further dependencies.

Reference Books:

1. Fundamentals of Database Systems, Elmasri & Navathe, Pearson Education
2. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata McGraw-Hill.
3. Database System Concepts, Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill, New Delhi, India.
4. Introduction to Database Systems, C.J.Date, Pearson Education
5. Introduction to SQL, Rick F.Vander Lans, Pearson Education

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Department of Computer Science and Engineering

Semester-IV

Course Code	DCSA-402
Course Title	Introduction to DBMS Lab
Number of Credits	1 (L:0; T:0; P:2)

List of practical to be performed:

1 Case Study-1: Employee database – 'Create' employee table, 'Select' and display an employee matching a given condition, 'Delete' duplicate records, delete rows using triggers, insert and update records, find net salary, etc.
2 Case Study-2: Visitor Management database
3 Case Study-3: Students Academic database
4 Case Study-4: Inventory Management System database
5 Case study-5: Bank Operations database
6 Case Study-6: Bus Operator (Roadways) – Do related activities such as prepare E-R Model, Relational Model, do Normalisation, Create Tables, Insert data, Delete Data, Query database, create stored procedures, etc.

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Undergraduate Diploma Courses in Engineering & Technology

Department of Computer Science and Engineering

Semester-IV

Course Code	DCSA-403
Course Title	Computer Networks
Number of Credits	3 (L:3; T:0; P:0)

Course Objectives:

Understand functioning of computer networks and popular networking protocols.

Course outcomes:

1. Understanding of computer networks, issues, limitations, options available.
2. Understanding of the care that needs to be taken while developing applications designed to work over computer networks
3. Able to configure basic LAN and connect computers to it.

UNIT 1:

Introduction to computer networks; Network Models- OSI Reference Model, TCP/IP Model.

UNIT 2:

Transmission Media – principles, issues and examples; Wired Media – Coaxial, UTP, STP, Fiber Optic Cables; Wireless Media – HF, VHF, UHF, Microwave, Ku Band; Network topologies; Data Link Layer – design issues, example protocols (Ethernet, WLAN, Bluetooth); Switching Techniques.

UNIT 3:

Network Layer - design issues, example protocols (IPv4); Routing - principles/issues, algorithms (Distance-vector, Link-state) and protocols (RIP, OSPF).

UNIT 4:

Transport Layer - design issues, example protocols (TCP); Application Layer Protocols (SMTP, DNS).

UNIT 5:

Functioning of Network Devices – NIC, Hub, Switch, Router, WiFi Devices; Network Management System and example protocol (SNMP).

Reference Books:

1. Computer Networks, 4th Edition (or later), Andrew S. Tanenbaum, PHI
2. TCP/IP Illustrated, Volume-1, W. Richard Stevens, Addision Wesley
3. Data and Computer Communications, William Stallings, PHI
4. An Engineering Approach to Computer Networking, S. Keshav, Addision Wesley/Pearson
5. An Integrated Approach to Computer Networks, Bhavneet Sidhu, Khanna Publishing House.

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Undergraduate Diploma Courses in Engineering & Technology
Department of Computer Science and Engineering
Semester-IV

Course Code	DCSA-403
Course Title	Computer Networks Lab
Number of Credits	1 (L:0; T:0; P:2)

List of practical to be performed:

1 Showing various types of networking cables and connectors, identifying them clearly

2 Looking at specifications of cables and connectors of various companies on Internet, find out differences.

3 Making patch cords using different types of cables and connectors - crimping, splicing, etc

4 Demonstration of different type of cable testers, using them for testing patch cords prepared by the students in Lab and standard cables prepared by professionals

5 Configuring computing devices (PC, Laptop, Mobile, etc) for network, exploring different options and their impact – IP address, gateway, DNS, security options, etc

6 Showing various networking devices – NICs, Hub, Switch, Router, WiFi access point, etc.

7 Looking at specifications of various networking devices various companies on Internet, find out differences.

8 Network simulation tool (e.g. Cisco Packet Tracer)

9 Setting up a small wired LAN in the Lab

10 Setting up a small wireless LAN in the Lab

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Semester-IV

Course Code	DCSA-404
Course Title	Software Engineering
Number of Credits	4 (L:3: T:1: P:0)

Course Objectives:

Inculcate essential technology and software engineering knowledge and skills essential to build a reasonably complex usable and maintainable software iteratively. Emphasize on structured approach to handle software development. Enhance communication skills.

Course outcomes:

The proposed course is expected to provide an introduction to software engineering concepts and techniques to undergraduate students, thus enabling them to work in a small team to deliver a software system. The course content and project will introduce various software technologies, process and project management skills that are needed for the delivery of software in a team setting.

UNIT 1:

Introduction to Software Engineering, Lifecycle, Process Models - Traditional v/s Agile processes.

UNIT 2:

Development Activities - Requirements Gathering and Analysis, Design Concepts, Software architecture and Architectural styles, Basic UI design, Effective Coding and Debugging techniques.

UNIT 3:

Software Testing Basics, Unit, Integration, System and Acceptance Testing, Introduction to various testing techniques (e.g. Stress testing), Writing and executing test cases, Quality Assurance.

UNIT 4:

Project Management - Project management concepts, Configuration and Release Management, Metrics.

UNIT 5:

Version Control and its tools (Git), Release Planning, Change Management, Software Maintenance, Project.

Reference Books:

1. Software Engineering – A Practitioner's Approach, 7th Edition, Roger Pressman.
2. Software engineering, Ian Sommerville, Pearson Education
3. An Integrated Approach to Software Engineering, Pankaj Jalote, Springer Verlag
4. Software Engineering, Nasib Singh Gill, Khanna Book Publishing Co. India.
5. Software Engineering, K. K. Agarval, Yogesh Singh, New Age International Publishers

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Undergraduate Diploma Courses in Engineering & Technology

Department of Computer Science and Engineering

Semester-IV

Course Code	DCSA-405
Course Title	Program Elective-I (A) Web Technologies
Number of Credits	4 (L:3: T:1: P:0)

Course Objectives:

To provide basic skills on tools, languages and technologies related to website development. Learnings from this course may be used in the Mini Project and summer internship.

Course outcomes:

Student will be able to develop/build a functional website with full features.

UNIT 1: Introduction to www

Protocols and programs, secure connections, application and development tools, the web browser, What is server, setting up UNIX and LINUX web servers, Logging users, dynamic IP Web Design: Web site design principles, planning the site and navigation.

UNIT 2: Web Systems Architecture

Architecture of Web based systems- client/server (2-tier) architecture, 3-Tier architecture, Building blocks of fast and scalable data access Concepts - Caches-Proxies- Indexes-Load Balancers- Queues, Web Application architecture (WAA).

UNIT 3: Javascript

Client side scripting, What is Javascript, simple Javascript, variables, functions,conditions, loops and repetition.

UNIT 4: Advance scripting

Javascript and objects, Javascript own objects, DOM and web browser environments, forms and validations.
DHTML: Combining HTML, CSS and Javascript, eventsand buttons, controlling your browser,
Ajax: Introduction advantages & disadvantages,ajax based web application, alternatives of ajax
XML, XSL and XSLT: Introduction to XML, uses of XML, simple XML,XML keycomponents,
DTD and Schemas, XML with application, XSL and XSLT.
Introduction to Web Services

UNIT 5: PHP

server side scripting, Arrays, function and forms, advance PHP Databases :Basic command with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP my admin and database bugs.

Reference Books:

1. "Web Technologies--A Computer Science Perspective", Jeffrey C.Jackson,
2. "Internet & World Wide Web How To Program", Deitel, Deitel, Goldberg, Pearson Education
3. "Web programming- Building Internet Application", Chris Bales
4. Web Applications: Concepts and Real World Design, Knuckles.

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Undergraduate Diploma Courses in Engineering & Technology

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Semester-IV

Course Code	DCSA-405
Course Title	Program Elective-I (B) Mobile Computing
Number of Credits	4 (L:3: T:1: P:0)

Course Objectives:

To teaches how to build mobile apps for Android. Students are expected to work on a project as part of the course.

Course outcomes:

Will be able to develop and deploy basic mobile applications

UNIT 1:

A brief history of Mobile, Types of mobile phone generations, The Mobile Ecosystem, Types of Mobile Applications, Mobile Information Architecture Android Versions, Features of Android, Android Architecture, Installing Android SDK Tools, Configuring Android in Eclipse IDE, Android Development Tools (ADT), Creating Android Virtual Devices (AVD)

UNIT 2:

Creating first android application, Anatomy of android application, Deploying Android app on USB connected Android device, Android application components, Activity life cycle, Understanding activities, Exploring Intent objects, Intent Types, Linking activities using intents.

UNIT 3:

Fragments life cycle, Interaction between fragments, Understanding the components of a screen (Layouts), Adapting to display orientation, Action Bar, Views(UI Widgets)-Button, Toast, Toggle Button, Check Box, Radio Button, Spinner, Web View, Edit Text, Date Picker, Time Picker, List View, Progress-Bar, Analog and Digital clock, Handling UI events, List fragment, Dialog fragment.

UNIT 4:

Menus-Option, Context, Popup, Images-Image View, Image Switcher, Alert Dialog, Alarm manager, SMS, E-mail, Media Player, Using camera, recording video, Handling Telephony Manager.

UNIT 5:

Storing the data persistently-Data Storage Options: preferences, Internal Storage, External Storage, Content Provider , The SQ Lite database, Connecting with SQ Lite database and operations-Insert, Delete, Update, Fetch, Publishing android applications, Deploying APK files.

Reference Books:

1. Wei-Meng Lee, Beginning Android 4 Application Development, Wiley Publishing, Inc.
2. Pradeep Kothari, "Android Application Development Black Book", DreamTech Press
3. James C.Sheusi, "Android Application Development for Java Programmers", Cengage Learning
4. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd
5. Sayed Y Hashimi and Satya Komatineni(2009), "Pro Android", Wiley India Pvt Ltd
6. Reto Meier, Professional Android 4 Application Development, Wiley India Pvt Ltd

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Semester-IV

Course Code	DCSA-406
Course Title	Minor Project
Number of Credits	2 (L:0: T:0: P:4)

Course Outcomes:

Build projects as per industry and society demands.

Guidelines:

Minor Project should cater to a small system required in laboratory or real life.

• After interactions with course coordinator and based on comprehensive literature survey/need analysis, the student shall identify the title and define the aim and Preambles of Minor project.

• Student is expected to detail out specifications, methodology, resources required, critical issues involved in design and implementation and submit the proposal within first week of the semester.

• The student is expected to exert on design, development and testing of the proposed work as per the schedule.

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Undergraduate Diploma Courses in Engineering & Technology

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Semester-IV

Course Code	DCSA-407
Course Title	Mandatory Course(Essence of Indian Knowledge and Tradition)
Number of Credits	0 (L:2: T:0: P:0)

Course Objectives:

1 To explore the intersections between modern scientific principles and traditional Indian knowledge systems, highlighting their complementarities and unique contributions.

2To provide students with a comprehensive understanding of holistic health care practices, including Yoga and Ayurveda, and their applications in promoting well-being.

3To impart knowledge about the historical and cultural significance of the Vedas and other ancient Indian texts, fostering an appreciation for their enduring relevance in contemporary society.

Course outcomes:

1 Students will be able to critically analyze and apply concepts from both modern science and Indian knowledge systems to contemporary health and wellness challenges.

2 Students will gain practical knowledge and skills in Yoga and other holistic health practices, enabling them to incorporate these methods into their personal and professional lives for enhanced well-being.

3 Students will demonstrate an understanding of the historical and philosophical underpinnings of the Vedas and other Indian scriptures, appreciating their influence on modern thought and practices in holistic health care.

1.Modern Science

2 .Indian Knowledge System

3 Yoga

4 Holistic Health care

5. वेद,

Reference Books:

1. Cultural Heritage of India-Course Material by V. Sivaramakrishna-Bharatiya Vidya Bhavan, Mumbai, 5th Edition, 2014
2. Modern Physics and Vedant by Swami Jitatmanand - Bharatiya Vidya Bhavan
3. The wave of Life by Fritzof Capra
4. Tarkasangraha of Annam Bhatta, Inernational by V N Jha- Chinmay Foundation, Velliarnad,Amaku,
5. Science of Consciousness Psychotherapy and Yoga Practices by RN Jha - Vidyanidhi Prakasham, Delhi, 2016

THE END