DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA , BHOPAL

SCHEME OF STUDIES & EXAMINATIONS (IMPLEMENTED FROM SESSION : JULY 2023)

SCHEME	NAME OF BRANCH	BRANCH CODE	SEMESTER
OCBC JULY2022/ 2023	COMPUTER SCIENCE & ENGG.	C04	FOURTH (IV)

S.N.	PAPER CODE	SUBJECT CODE	SUBJECT NAME	THEORY COMPONENT								PRACTICAL COMPONENT					TOTAL CREDITS	TOTAL MARKS
				HRS PER WEEK	CREDITS	TERM WORK				THEORY PAPER		HRS PER WEEK	CREDITS	LAB WORK	PRACTICAL EXAM/VIVA			
						QUIZ/ASSIGNMENT	MID TERM TEST*		TOTAL	MARKS	DURATION				MARKS	DURATION		
							I	II										
1	7486	401	OPERATING SYSTEMS	4	4	10	10	10	30	70	03 Hrs.	2	1	20	30	03 Hrs.	4	150
2	7487	402	INRTODUCTION TO DBMS	3	3	10	10	10	30	70	03 Hrs.	2	1	20	30	03 Hrs.	4	150
3	7488	403	COMPUTER NETWORKS	3	3	10	10	10	30	70	03 Hrs.	4	2	20	30	03 Hrs.	6	150
4	7489	404	SSAD/SOFTWARE ENGINEERING	4	4	10	10	10	30	70	03 Hrs.	0	0	0	0	0	4	100
5	7490	405	WEB TECHNOLOGIES	3	3	10	10	10	30	70	03 Hrs.	4	2	20	30	03 Hrs.	5	150
6			MINOR PROJECT	0	0	0	0	0	0	0	0	4	2	20	30	03 Hrs.	2	50
7			ESSENCE OF INDIAN KNOWLEDGE & TRADITION	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8			LIBERARY /SEMINAR/VISITS etc.	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
TOTAL				19	17				150	350		17	8	100	150		25	750

NOTE - (1)* Two Best,out of Three Mid Term Tests (Progressive Tests) Marks should be entered here.

GRAND TOTAL OF CREDITS	GRAND TOTAL OF MARKS
25	750

DIPLOMA WING
RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL
DIPLOMA IN COMPUTER SCIENCE & ENGINEERING (C04)

SEMESTER IV

COURSE TITLE	:	OPERATING SYSTEMS
PAPER CODE	:	7486
SUBJECT CODE	:	401
TREORY CREDITS	:	04
PRACTICAL CREDITS	:	01

Course Learning 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 Content:

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

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.

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OPERATING SYSTEMS LAB

Course Learning Objectives:

This Lab course is intended to practice and do experiment on concepts taught in theory class of 'Operating Systems' and gain insight into functioning of the Operating Systems.

Course Content:

S.No.	Topics for Practice
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
8	Simulate all LRU Page Replacement Algorithms using C program
9	Simulate Paging Technique of Memory Management
10	Practice various commands/utilitiessuch as catnl, uniq, tee, pg, comm, cmp, diff, tr, tar, cpio, mount, umount, find, umask, ulimit, sort, grep, egrep,fgrep cut, paste, join, du, df , ps, who, etc and many more.

This is a skill course. More student practice and try to find solution on their own, better it will be.

Reference Books:

1. Operating System Concepts, Silberschatz, Abraham and Galvin, Peter, Wiley India Limited
2. UNIX Concepts and Applications, Sumitabha Das, McGraw-Hill Education
3. Operating System Concepts, Ekta Walia, Khanna Publishing House

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, and become an advance user of operating system.

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RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL
DIPLOMA IN COMPUTER SCIENCE & ENGINEERING (C04)

SEMESTER IV

COURSE TITLE	:	INTRODUCTION TO DBMS
PAPER CODE	:	7487
SUBJECT CODE	:	402
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	01

Course Learning 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 Content:

As a part of the lab, project work is included.

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

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.

INTRODUCTION TO DBMS LAB

Course Learning Objectives:

This Lab course is intended to practice whatever is taught in theory class of 'Introduction to DBMS'. A few sample case studies are listed with some suggested activities. More case studies may be added to this list. You need to develop these case studies, apply all relevant concepts learnt in theory class as the course progress, identify activities/operations that may be performed on the database. It will be a good idea to also use concepts learnt in the course on Software Engineering/SSAD.

Course Content:

S.No.	Topics for Practice
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.

This is a skill course. More student practice and try to find solution on their own, better it will be.

Reference Books:

1. Elmasri & Navathe, Fundamentals of Database Systems, Pearson Education
2. Raghurama Krishnan, Johannes Gehrke, Database Management Systems, Tata McGraw-Hill, New Delhi, India.
3. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts, 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

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.

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DIPLOMA IN COMPUTER SCIENCE & ENGINEERING (C04)

SEMESTER IV

COURSE TITLE	:	COMPUTER NETWORKS
PAPER CODE	:	7488
SUBJECT CODE	:	403
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	02

Course Learning Objectives:

Understand functioning of computer networks and popular networking protocols

Course Content:

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

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.

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COMPUTER NETWORKS LAB

Course Learning Objectives:

This Lab course is intended to practice whatever is taught in theory class of 'Computer Networks'. Some of the things that should necessary be covered in lab are listed below:

Course Content:

S.No.	Topics for Practice
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

This is a skill course. More student practice and try to find solution on their own, better it will be.

Reference Books:

1. Cisco press books on CCNA
2. User manual of networking devices available in the lab
3. Wiki pages on networking devices

Course outcomes:

1. Understanding of computer networks, issues, limitations, options available.
2. Able to configure basic small LAN and connect computers to it.

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DIPLOMA IN COMPUTER SCIENCE & ENGINEERING (C04)

SEMESTER IV

COURSE TITLE	:	SSAD/SOFTWARE ENGINEERING
PAPER CODE	:	7489
SUBJECT CODE	:	404
TREORY CREDITS	:	04
PRACTICAL CREDITS	:	00

Course Learning Objectives:

Inculcate essential technology and software engineering knowledge and skills essential to build a reasonably complex usable and maintainable software iteratively. 2) Emphasize on structured approach to handle software development. 3) Enhance communication skills.

Course Content:

As per the course design, concepts learned as part of this course will/should be used in the Minor Project (Proj.202). These two courses should go hand in hand to be effective.

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

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

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.

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SEMESTER IV

COURSE TITLE	:	WEB TECHNOLOGIES
PAPER CODE	:	7490
SUBJECT CODE	:	405
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	02

Course Learning 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 Content:

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 andforms,advance PHP Databases :Basic command with PHP examples, Connection to server,creating database, selecting a database, listing database, listing tablenames creating a table, inserting data,altering tables, queries, deletingdatabase, deleting data and tables, PHP myadmin and database bugs.

Reference Books:

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

Course Outcomes:

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

WEB TECHNOLOGIES LAB

Course Learning Objectives:

This Lab course is intended to practice whatever is taught in theory class of 'Web Technologies'. Some of the things that should necessary be covered in lab are listed below:

Course Content:

S.No.	Topics for Practice
1	Coding Server Client Programs
2	Developing Web Application using HTML, JavaScript
3	Developing Advanced Web Application Programs using CSS
4	Practicing PHP : Basics
5	Practicing PHP : Web Application Development
6	Practicing PHP: MySql - tiered Applications
7	Developing a fully functional Web Service Application using all the technologies learned in this course.

This is a skill course. More student practice and try to find solution on their own, better it will be.

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

Course outcomes:

Student will be able to program web applications using and will be able to do the following:

- Use LAMP Stack for web applications
- Use Tomcat Server for Servlets and JSPs
- Write simple applications with Technologies like HTML, Javascript, AJAX, PHP, Servlets and JSPs
- Connect to Database and get results
- Parse XML files using Java (DOM and SAX parsers)

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

DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

DIPLOMA IN COMPUTER SCIENCE & ENGINEERING (C04)

SEMESTER - IV

COURSE TITLE	:	MINOR PROJECT
PAPER CODE	:	--
SUBJECT CODE	:	--
TREORY CREDITS	:	00
PRACTICAL CREDITS	:	02

MINOR PROJECT –

Evaluation is based on work done, quality of report performance in viva-voce, presentation etc.

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SEMESTER - IV

COURSE TITLE	:	ESSENCE OF INDIAN KNOWLEDGE & TRADITION
PAPER CODE	:	--
COURSE CODE	:	--
TREORY CREDITS	:	00
PRACTICAL CREDITS	:	00

Course Content:

Basic Structure of Indian Knowledge System:

(i) वेद, (ii) उन्नवेद (आयवेद, धनुवेद गन्धवेद स्थान्त्य आदद) (iii) वेदांग (शिक्षा कल्न ननरूत व्याकरण ज्योनतष छांद),

(iv) उन्नाइग (धर्म र्ीरांसा, न्नुराण, तकमिस्त्र)

- Modern Science and Indian Knowledge System
- Yoga and Holistic Health care
- Case Studies.

SUGGESTED TEXT/REFERENCE BOOKS:

S. No.	Title of Book	Author	Publication
1.	Cultural Heritage of In-dia-Course Material	V. Sivaramakrishna	Bharatiya Vidya Bhavan, Mumbai, 5th Edition, 2014
2.	Modern Physics and Vedant	Swami Jitatmanand	Bharatiya Vidya Bhavan
3.	The wave of Life	Fritzof Capra	
4.	Tao of Physics	Fritzof Capra	
5.	Tarkasangraha of Annam Bhatta, Inernational	V N Jha	Chinmay Foundation, Velliarnad, Amaku,am
6.	Science of Consciousness Psychotherapy and Yoga Practices	RN Jha	Vidyanidhi Prakasham, Delhi, 2016

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