

**SYLLABUS FOR
THE FOUR-YEAR UNDERGRADUATE
PROGRAMME (FYUGP)**

**As per provision of NEP-2020 to be implemented from
Academic Year 2022 onwards**



DEPARTMENT OF COMPUTER SCIENCE
GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE,
RAJNANDGAON (C.G.)

B. Sc. (Multiple Major) - DIPLOMA COURSE (Session 2024-25)

Major 1- Computer Science

	SEMESTER	COURSE TYPE	COURSE CODE	PAPER TITLE	CREDIT	Max Marks	ESE	IA
SECOND YEAR	III	DSC	UBSDCT 304	Operating System with Linux	4	100	80	20
			UBSDCL 304	Operating System with Linux Lab		50	Practical Record – 20 + Practical 10 + Viva 10	10
		DSE	UBSDET	Computer Organization & Architecture	4	100	80	20
		SEC		Choose by SEC Pool (Python Programming - I)	2	50	40	10
		VAC		(Choose by SEC Pool) Cyber Security - I	2	50	40	10
	IV	DSC		Database Management System	4	100	80	20
				Database Management System LAB		50	Practical Record – 20 + Practical 10 + Viva 10	10
		DSE		Computer Networks	4	100	80	20
		SEC		Choose by SEC Pool (Python Programming- II)	2	50	Practical Record – 20 + Practical 10 + Viva 10	10
		VAC		Choose by SEC Pool (Cyber Security - II)	2	50	Practical Record – 20 + Practical 10 + Viva 10	10

ESE- End Semester Exam, IE-Internal Assessment

Instruction for Question paper setting

End Semester Exam (ESE) for DSC and DSE There will be 03 sections of question of 80marks

Section A- section A will be very short answer type questions consisting 8 questions of 2 marks, two question from each unit.

Section B- section B will be short answer type questions consisting 4 questions of 6 marks each, one question from each unit with internal choice.

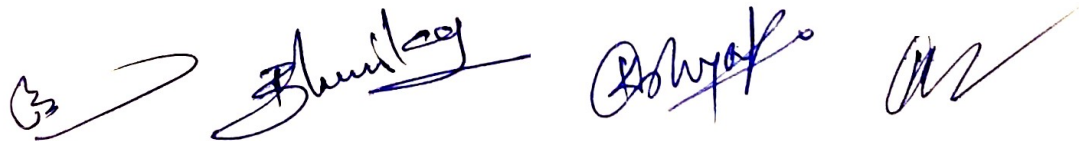
Section C- section B will be long answer (Descriptive) type questions consisting 4 questions of 10 marks each, one question from each unit with internal choice.

End Semester Exam (ESE) for SEC

There will be 8 questions of 8 marks each, out of which any 5 question to be answer.Total marks will be 40.

Minimum Pass Marks 40%

Section	Maximum Marks (80)		Maximum Marks (40)	
A	$2 \times 8 = 16$	Very short answer type questions consisting 8 questions of 2 marks, two question from each unit.	$8 \times 5 = 40$	8 questions of 8 mark each, out of which any 5 question to be answer.
B	$6 \times 4 = 24$	Short answer type questions consisting 4 questions of 6 marks each, one question from each unit with internal choice.		
C	$10 \times 4 = 40$	long answer (Descriptive) type questions consisting 4 questions of 10 marks each, one question from each unit with internal choice		



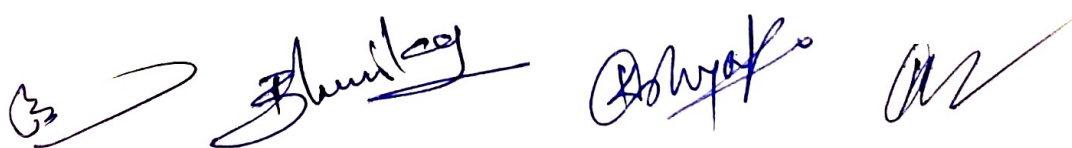
**SYLLABUS OF 4 YEARS UG PROGRAM (FYUGP) IN COMPUTER SCIENCE,
GOVT. DIGVIJAY AUTONOMOUS P G COLLEGE, RAJNANDGAON,
AS PER NEP 2020 (SEMESTER-III AND IV)**

Program Objective

- Po1- It is to give foundation knowledge for the students to understand advance Computer Science including applied aspect for the same.
- Po2- It is to develop enhanced quantitative skills and pursuing higher Computer Science and research as well as.
- Po3- Students will be able to develop software as well as operating knowledge computer application.
- Po4- Students will become employable in various governments, public and private sectors.
- Po5- Scientific tempers in general and computer temper in particular will be developed in students.
- Po6- Sufficient subject matter competence and enable students to prepare for various competitive examinations such as GATE, UGC-CSIR, NET/JRF and Civil Services Examinations.

Program Specific Outcome (PSO)

- PSO1- Student should be able to understand the inside of operating system mechanism as well as FOSS with Linux.
- PSO2- Student should be able to know the hardware working parts and its architecture which help to working in hardware field.
- PSO3- Student understand and programming knowledge of python programming.
- PSO4- Student should be able to working in Database management system.
- PSO5- Student should be able to know the inside of computer networks working as well as functions of using networking hardware devices.
- PSO6- Student should be able to know functions and development website.





GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)

FYUGP (CBCS/LOCF Course)

Department – Computer Science

Session: 2024-25	Program: B.Sc. (Maths)
Semester: III	Subject: Computer Science
Course Type: DSC	Course Code: USBDCCT 304
Course Title:	Operating System with Linux
Credit: 4 (3 Theory + 1 Practical)	Lecture: 60
M.M. 100 = Theory (ESE 80 + IA 20) (Theory)	Minimum Passing Marks: 40%
M.M. 50 = 50 (Internal 10 + Practical (Practical) Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: 40%

Title	Operating System with Linux
Course Learning Outcome:	<ul style="list-style-type: none">• Describe the important computer system resources and the role of operating system in their management policies and algorithms.• To understand various functions, structures and history of operating systems and should be able to specify objectives of modern operating systems and describe how operating systems have evolved over time.• Understanding of design issues associated with operating systems.• Understand various process management concepts including scheduling,• synchronization, and deadlocks.• To understand concepts of memory management including virtual memory.• To have sound knowledge of various types of operating systems including Unix and Android.• Describe the functions of a contemporary operating system with respect to convenience, efficiency, and the ability to evolve.• Students will be able to understand key features of the various Linux Operating Systems.• Implement various commands of Linux Operating System.• Students will be able to understand the directory structure, shell commands and shell scripting of Operating System.

Units	Lectures	Lectures (15 x 3 = 45)	Credits
I	15	(Introduction to Operating System) What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real time Systems.	1
II		(Operating System Organization and Process Characterization) Processor and User Modes, Kernels, System Calls and System Programs, , Process Hierarchy, Threads, Process Scheduling, Non-Pre-emptive and Pre-emptive Scheduling Algorithms. Concurrent and Dependent Processes, Semaphores .	
III	15	Process Synchronization, Classical Process Synchronization Problems.Process Management (Deadlock) Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery. Memory Management, Virtual Memory.	1
IV	15	<p>Introduction to Linux</p> <p>Free & Open Source Software . Distribution version of Linux. Introduction to Multi-user System, , Feature and benefits. System Structure: - Hardware requirements, Kernel and its function, introduction to System calls and shell.</p> <p>File System: Feature of Unix File System, Concept of i-node table, commonly used commands like who, pwd, cd, mkdir, rm, ls, mv, lp, chmod, cp, grep, pr, make, calc, etc.</p> <p>Shell Programming : Introduction to shell feature, wild card characters, i/out re-directions, standard error redirection, system and user created shell variables, profile files, pipes/tee, background processing, command line arguments, command substitution, read statements, conditional execution of commands, special shell variables \$ #, #?, \$* etc. Shift commands, loops and decision making for, while and until, choice making using case esac, decision making if Fi, using test, string comparison, numerical comparison, logical operation, using expr.</p>	1

BOOKS RECOMMENDED:

1. Operating System Concepts, Abraham Silberschatz, Peter B. Galvin and Greg Gagne (Wiley India Edition)
2. Modern Operating System, Andrew S.Tanenbaum, (PHI)
3. UNIX Complete Reference.
4. Linux The Complete Reference , (McGRAW-HILL)

Practical - Operating System with Linux Lab

Credit = 1

Max Mark: 50

Min Marks: 40%

Note: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculators allowed not scientific calculator. The consent teacher may modify the assignment questions as required.

1. In every program there should be comment for each coded line or block of code.
2. Practical files should contain printed program with name of author, date, path of program, unit no and printed output.
3. All the following programs or a similar type of programs should be prepared.

List of Pratical

Note: This is tantative list, consultant teacher may add or remove assignments as required.

1. Install Linux with following specifications-username,password,partions for various directories ,
2. Add a user and password, change the password.
3. Add & remove a group.
4. Install and configure (i)printer (ii) scanner

Using VI editor do the following exercises

1. In a file
 - i) replace the words 'has' with 'has not'.
 - ii) locate n^{th} character
 - iii) Sort lines 21 to 40
2. In a file copy/cut and paste following text-
 - i At i^{th} line, n lines to j^{th} line.
 - ii Yank a few words
 - iii Cut and paste n words to i^{th} position in l^{th} line
3. Open to files 'txtfile' and 'newfile' and copy/cut 5 lines from txtfile and paste them in newfile using vi editor.
4. Open 'txtffile' and copy/cut following and paste to the 'newfile'
 - i. 1^{th} to the last line in it

Create macro

- i. to paste your name at any position in the file.
- ii. to make the 1th function key to search for "loop" and copy into the buffer'a'.
all text following it up to but not including the string "end".
- iii. to remove all leading spaces in a file
- iv. to save and quit vi editor in input mode

Write shell commands



- I. List all files that match a class
- II. List all files that do not match a class.
- III. Change the fill permissions
- IV. Configure or set characteristics of your terminal. Describe any 3.
- V. Display the lines in a file that contain a particular word.
- VI. Append the contents of two files in a file JABC.
- VII. Count the number of files in a directory.

Write shell programs

- i. Display all the users currently logged in detail with colim headers.
- ii. List all files in current directory and save the list in a file ABC. Also save the contents of the files in ABC and display the contents in ABC in sorted order.
- iii. Sort the contents of a file ABC and save it in OABC
- iv. Display all the users currently logged in detail with column headers.
- v. To save current date & time, number of files & directories in the current directory and contents of all the files to a single file NFL.
- vi. To input a number and test whether it is +ve, -ve, or zero.
- vii. To test whether a filename is a regular file or a directory or of other type
- viii. To list only the directories in current path.
- ix. To print the greatest of three numbers.
- x. To print 12 terms of Fibonacci series.
- xi. To display all users currently logged in & also check a particular user every 30 seconds until he logs in.
- xii. To save current date & time, number of files in the current directory and contents of all the files matching a pattern to a single file NPFL.
- xiii. To display particular messages depending on the weekday.
- xiv. To display common messages for following group of days- Monday & Wednesday, Tuesday & Thursday and Friday & Saturday and other day.
- xv. xv. To accept a string from the terminal and echo a suitable message if it doesn't have at least 9 characters.
- xvi. Write a Shall Script to find the factorial of a number.
- xvii. Write a Shall Script to swap numbers using third variable.
- xviii. Write a Shall Script to print prime numbers between 1 to 20.
- xix. Write a Shall Script to greatest of three numbers.
- xx. Write a Shall Script to sort the contents of a file XYZ and save it in BCAII
- xxi. Write a Shall Script to display mathematical table of any number in the format Ex.: -3*1=3

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)



FYUGP (CBCS/LOCF Course)

Department: -Computer Science

Session: 2024-25	Program: B.Sc.(Maths)
Semester: III	Subject: Computer Science
Course Type: DSE	Course Code: UBSDET
Course Title:	Computer Organization & Architecture
Credit: 4	Lecture: 60
M.M. 100 = (ESE 80+IA 20)	Minimum Passing Marks: 40%

Title	Computer Organization & Architecture
Course Learning Outcome:	<ul style="list-style-type: none"> To make students understand the basic structure, operation and characteristics of digital computer. To familiarize the students with arithmetic and logic unit as well as the concept of the concept of pipelining. To familiarize the students with hierarchical memory system including cache memories and virtual memory. To make students know the different ways of communicating with I/O devices and standard I/O interfaces.

Units	Lectures	Lectures (15 x 4 = 60)	Credits
I	15	Fundamentals of Digital Electronics: Data Types, Complements, Fixed-Point Representation, Floating-Point Representation, Other Binary Codes, Error Detection Codes, Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits, Flip- Flops, Sequential Circuits, Counters, Multiplexer, Demultiplexer, Decoder, Encoder.	1
II	15	Register Transfer and Micro operations: Register Transfer Language, Register Transfer, Bus & Memory Transfer, Arithmetic Microoperations, Logic Microoperations, Shift Microoperation, Instruction codes, Computer Registers, Computer Instructions, Timing & Control, Instruction Cycles, Memory Reference Instruction, Input - Output & Interrupts.	1
III	15	Processor and Control Unit: Hardwired vs. Micro programmed Control Unit, General Register Organization, Stack Organization, Instruction Format, Data Transfer & Manipulation, Program Control, Pipelining – Pipelined data path and control – Handling Data hazards & Control hazards.	1

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IV	15	Memory and I/O Systems: Peripheral Devices, I/O Interface, Data Transfer Schemes, Program Control, Interrupt, DMA Transfer, I/O Processor. Memory Hierarchy, Processor vs. Memory Speed, High-Speed Memories, Cache Memory, Associative Memory, Interleave, Virtual Memory, Memory Management.	1
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Reference Book

Computer system Architecture – M.Morries Mano

Computer Fundamentals: Architecture and Organization- B.Ram



FYUGP (CBCS/LOCF Course)

Department – Computer Science

Session: 2024-25	Program: B.Sc.
Semester: III	Subject: Computer Science
Course Type: SEC	Course Code:
Course Title:	Python Programming - I
Credit: 2	Lecture: 30
M.M. 50 = (ESE 40 + IA 10)	Minimum Passing Marks: 40%

Title	Python Programming
Course Learning Outcome:	<ul style="list-style-type: none"> • Develop and Execute simple Python programs. Structure a Python program into functions. • Using Python lists, tuples to represent compound data Develop Python Programs for file processing

Units	Lectures	Lectures (15 x 2 = 30)	Credits
I	15	Introduction to python, Feature of Python Program. Execution of python program. Program, Writing Our First Python Program, Data types in Python. Python Interpreter and Interactive Mode; Values and Types: int, float, boolean, string, and list; Variables, Expressions, Statements, Tuple Assignment, Precedence of Operators, Comments; Modules and Functions, Function Definition and use, Flow of Execution, Parameters and Arguments .	1
II	15	Operators in Python, Input and Output, Control Statements. Boolean Values and operators, Conditional (if), Alternative (if-else), Chained Conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; . Arrays in Python, Strings and Characters. Strings: String Slices, Immutability, String Functions and Methods, String Module;. Functions, Lists and Tuples. List Operations, List Slices, List Methods ; Tuples: Tuple Assignment, Tuple as Return Value;	1

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TEXT BOOKS

- Mark Lutz, Learning Python
- Tony Gaddis, Starting Out With Python
- Kenneth A. Lambert, Fundamentals of Python
- James Payne, Beginning Python using Python 2.6 and Python 3

Reference Book

- Problem Solving using Python – E. Balagurusamy, Mc Graw Hill Education Ltd., 2017

Four handwritten signatures in blue ink are arranged horizontally. From left to right: a stylized signature starting with a large 'G', a signature that appears to be 'Shankar', a signature that appears to be 'Ashwath', and a signature that appears to be 'M'.

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)



FYUGP (CBCS/LOCF Course)

Department – Computer Science

Session: 2024-25	Program: B.A./B.Sc./B.Com/BCA
Semester: III	Subject: Computer Science
Course Type: VAC	Course Code:
Course Title:	Cyber Security - I
Credit: 2	Lecture: 30
M.M. 50 = (ESE 40 + IA 10)	Minimum Passing Marks: 40%

Title	Cyber Security - I
Course Learning Outcome:	<p>After completion of course the students will able to:-</p> <ul style="list-style-type: none"> • Measure the performance and troubleshoot Cyber security systems. • Implement Cyber security solutions. • Be able to use Cyber security, information assurance and Cyber /computer forensics software tool. • Identify the key cyber security vendors in the marketplace. • Design & develop a security architecture for an organization.

Units	Lectures	Lectures (15 x 2 = 30)	Credits
I	15	Network, Types of Network : LAN, MAN, WAN, PAN Computer security, WWW, IP Address Classes, Protocols: IP, HTTP, TCP, FTP, ARP Threats, Harm, Vulnerabilities, Control, Authentication, Access control and cryptograph. Web Attack : Browser attack, Web attack targeting users, obtaining user or website data.	1
II	15	Network Security: Introduction of Network Security and its importance. Cryptography Firewall: Introduction, Linux Firewall, Windows Firewall, Packet, VPN: the basic of Virtual Private Networks. Network Address Translation (NAT)	1

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GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
Department: - Computer Science

Session: 2024-25	Program: .B.Sc (Maths)
Semester: IV	Subject: Computer Science
Course Type: DSC	Course Code:
Course Title:	DATABASE MANAGEMENT SYSTEMS
Credit: 4 (3 Lecture + 1 Practical)	Lecture: 60
M.M. 100 = Theory (ESE 80 + IA 20) (Theory)	Minimum Passing Marks: 40%
M.M. 50 = 50 (Internal 10 + Practical (Practical) Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: 40%

Title	DATABASE MANAGEMENT SYSTEMS
Course Learning Outcome:	<ul style="list-style-type: none">• Gain knowledge of database systems and database management systems software.• Ability to model data in applications using conceptual modeling tools such as ER Diagrams and design data base schemas based on the model.• Formulate, using SQL, solutions to a broad range of query and data update problems.• Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.• Be acquainted with the basics of transaction processing and concurrency control.• Familiarity with database storage structures and access techniques. Compare, contrast and analyse the various emerging technologies for database systems such as NoSQL.• Analyse strengths and weaknesses of the applications of database technologies to various subject areas.• Demonstrate an understanding of the relational data model.• Transform an information model into a relational database schema and to use a DDL,DCL and DML, and/or utilities to implement the schema using a DBMS.• Formulate, using relational algebra, solutions to a broad range of query problems.• Formulate, using SQL, solutions to a broad range of query and data update problems.

Units	Lectures	Lectures (15 x 3 = 45)	Credits
I	15	Basic database concept, Terminology & Architecture, Types of database Management Systems. Differences between Relational and other Database Models. Data Modelling: Relations, Schemas, Constraints, Queries, and Updates; Conceptual vs. Physical Modeling; Entity Types, attributes, ER Diagrams.	1
II		SQL Data Definition: Specifying Tables, Data Types, Constraints; Simple SELECT, INSERT, UPDATE, DELETE Statements; Complex SELECT Queries, including Joins and Nested Queries; Actions and Triggers; Views; Altering Schemas.	
III	15	Relational Algebra: Definition of Algebra; Relations as Sets; Operations: SELECT, PROJECT, JOIN, etc. Normalization Theory and Functional Dependencies, 2NF, 3NF, BCNF, 4NF, 5NF;	1
IV	15	Indexing: Files, Blocks, and Records, Hashing; RAID; Replication; Single-Level and Multi-Level Indexes; B-Trees and B+-Trees. Query Processing Translation of SQL into Query Plans; Basics of Transactions, Concurrency and Recovery.	1

TEXTBOOKS

- Elmasri's and Navathe's Fundamentals of Database Systems. Addison-Wesley

REFERENCE BOOK

- Data Base Management Systems, Raghu Ramakrishnan, Johannes Gehrke, McGraw Hill Education
- Data Base System Concepts, A. Silberschatz, Henry. F. Korth, S. Sudarshan, McGraw Hill Education

Practical : Database Management System LAB

Credit = 1

1. In every program there should be comment for each coded line or block of code.
2. Practical files should contain printed program with name of author, date, path of program, unit no and printed output.
3. All the following programs or a similar type of programs should be prepared.

List of Practical

Note: This is tantative list. consultant teacher may add or remove assignments as required.

1. Using the following database,
 - Colleges (ename, city, address, phone, afdate)
 - Staffs (sid, sname, saddres, contacts)
 - Staffjoines (sid, cname, dept, DOJ, post salary0
 - Techings (sid, class, paperid, fsession, tsession)
 - Subject (paperid subject paperno, papename)

Write SQL statements for the following -

- a) Create the above tables with the given specifications and constraints.
- b) Insert about 10 rows as are appropriate to solve the following queries.
- c) List the name of the teachers teaching computer subjects.

- d) List the name and cities of all staff working in your college.
- e) List the names and cities of all staff working in your college who earn more than 15,000
- f) Find the staffs whose names start with 'M' or 'R' and ends with 'A' and /or 7 characters long
- g) Find the staffs whose date of joining is 2005.
- h) Modify the database so that staff N1 now works in C2 College
- i) List the names of subjects, which T1 teaches in this session or all sessions.
- j) Find the classes that T1 do not teach at present session.
 - a. Find the colleges who have most number of staffs.
 - b. Find the staffs that earn a higher salary who earn greater than average salary of their college.
 - c. Find the colleges whose average salary is more than average salary of C2
 - d. Find the college that has the smallest payroll.
 - e. Find the colleges where the total salary is greater than the average salary of all colleges
 - f. List maximum average, minimum salary of each college.
 - a. List the names of the teachers, departments teaching in more than one department
 - b. Acquire details of staffs by name in a college of each college.
 - c. Find the names of staff that earn more than each staff of C2 College.
 - d. Give all principals a 10% rise in salary unless their salary become greater than 20,000 in such case give 5% rise.
 - e. Find all staff that do not work in same cities as the colleges they work.
 - f. List names of employees in ascending order according to salary who are working in your college or all colleges.
 - a. Create a view having fields sname, cname, dept, DOJ, and post
 - b. Create a view consisting of cname, average salary and total salary of all staff in that college.
 - c. Select the colleges having highest and lowest average salary using above views.

2. Create the following database,

Enrollment (enrollno, name, gender, DOB, address, phone)
 Admission (admno, enrollno, course, yearsem, date, cname)
 Colleges (cname, city, address, phone, afdate)
 Fee Structure (course, yearsem, fee)
 Payment (billno, admno, amount, pdate, purpose)

- a) Create the above tables with the given specifications and constraints.
- b) Insert about 10 rows as are appropriate to solve the following queries.
- c) Get full detail of all students who took admission this year class wise
- d) Get detail of students who took admission in Bhilai colleges.
- e) Calculate the total amount of fees collected in this session
 - i) By your college ii) by each college iii) by all colleges
- a) List the students who have not payed full fee
 - i) in your college ii) in all colleges
- b) List the number of admissions in your class in every year.
- c) List the students in the session who are not in the colleges in the same city as they live in.
- d) List the students in colleges in your city and also live in your city.

3. Create the following database,

Subjects (paperid, subject, paper, papername)
 Test (paperid, date, time, max, min)
 Score (rollno, paperid, marks, attendance)
 Students (admno, rollno, class, yearsem)

- a. Create the above tables with the given specifications and constraints.
- b. Insert about 10 rows as are appropriate to solve the following queries.
- c. List the students who were present in a paper of a subject.
- d. List all roll numbers who have passed in first division
- e. List all student in BSC-II who have scored higher than average
 - i) in your college ii) in every college
- f. List the highest score, average and minimum score in BSC-II
 - i) In your college ii) in every college

4. **Enrollment** (enrollno, name, gender, DOB, address, phone)

Admission (admno, enrollno, course, yearsem, date, cname)

Colleges (cname, city, address, phone,afdate)

FeeStructure (course, yearsem, fee)

Payment (billno, admno, amount, pdate, purpose)

- a. Create the above tables with the given specifications and constraints.
- b. Insert about 10 rows as are appropriate to solve the following queries.
- c. Get full detail of all students who took admission this year classwise
- d. Get detail of students who took admission in Bhilai colleges.
- e. Calculate the total amount of fees collected in this session
 - i) by your college ii) by each college iii) by all colleges

5. **Enrollment** (enrollno, name, gender, DOB, address, phone)

Admission (admno, enrollno, course, yearsem, date, cname)

Colleges (cname, city, address, phone,afdate)

FeeStructure (course, yearsem, fee)

Payment (billno, admno, amount, pdate, purpose)

- i.) List the students who have not payed full fee
 - ii) in your college ii) in all colleges
- iii) List the number of admissions in your class in every year.
- iv) List the students in the session who are not in the colleges in the same city as they live in.
- v) List the students in colleges in your city and also live in your city.



GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)

FYUGP (CBCS/LOCF Course)

Department: - Computer Science

Session: 2024-25	Program: B.Sc.
Semester: IV	Subject: .Computer Science
Course Type: DSE	Course Code:
Course Title:	Computer Networks
Credit: 4	Lecture: 60
M.M. 100 = (ESE 80 + IA 20)	Minimum Passing Marks: 40%

Title	Computer Networks
Course Learning Outcome:	<ul style="list-style-type: none"> Understand the structure of Data Communications System and its components. Be familiarize with different network terminologies. Familiarize with contemporary issues in network technologies. Know the layered model approach explained in OSI and TCP/IP network models Identify different types of network devices and their functions within a network. Learn basic routing mechanisms, IP addressing scheme and internet working concepts. Familiarize with IP and TCP Internet protocols. To understand major concepts involved in design of WAN, LAN and wireless networks. Learn basics of network configuration and maintenance. Know the fundamentals of network security issues.

Title		Computer Networks	
Units	Lectures	Lectures (15 x 4 = 60)	Credits
I	15	Introduction to Computer Networking Data Communication, Networks – Distributed Processing, Network Criteria, Applications; Protocols and Standards, Standard Organization, Line Configuration – Point to Point, Multi Point; Topology – Mesh, Star, Tree, Bus, Ring, Hybrid; Transmission mode, Categories of Network – LAN, MAN, WAN, Inter Networks, Error detection and correction, hamming code, Router, gateway, Modem, Bridge.	1
II	15	Transmission of Digital Data Analog and Digital, digital data transmission – parallel transmission, serial transmission, DTE-DCE interface – data terminal equipment, data circuit terminating equipment, standards, modems Transmission rate, Modem standards.	1

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		Multiplexing technique - FDM, TDM, switching technique- Circuit Switching, Packet Switching.	
III	15	The OSI Model & TCP/IP Model ISO organization, The model – Layered architecture, functions of the layers – Physical layer, Data Link layer, Network layer, Transport layer, session layer, Presentation layer, Application layer. The TCP/IP reference model, comparison of TCP/IP & OSI, Introduction to Internet – ARPANET, Architecture of Internet, Client server model, WWW, IP Address Classes, Protocols: IP, HTTP, TCP, FTP, ARP.	1
IV	15	Network Security: Introduction of Network Security and its importance. Cryptography: Definitions, Symmetric Key Cryptography: Traditional Ciphers, Simple modern Ciphers, DES (Data encryption system) Asymmetric Key Cryptography: RSA, Security Services, Digital Signatures.	1

REFERENCE BOOKS

- B. A. Forouzan: Data Communications and Networking, Fourth edition, THM Publishing Company Ltd 2007.
- A. S. Tanenbaum: Computer Networks, Fourth edition, PHI Pvt. Ltd 2002



GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
 Department: -.Computer Science

Session: 2024-25	Program: B.Sc.
Semester: IV	Subject: Computer Science
Course Type: SEC	Course Code:
Course Title:	Python Programming - II
Credit: 2	Lecture: 30
M.M. 50 = (Internal 10 + Practical Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: 40%

Title	Python Programming - II
Course Learning Outcome:	<ul style="list-style-type: none"> • Understand the fruitful function local & global scope • Understand the advance uses of list in Python. • Understand the knowledge of Dictionaries. • Practical knowledge of Python Programming.

Units	Lectures	Lectures (15 x 2 = 30)	Credits
I	15	Fruitful Functions: Return Values, Parameters, Local and Global Scope, Advanced List Processing - List Comprehension. Cloning Lists, List Parameters; Lists as Arrays, List Loop, Mutability, Aliasing, Dictionaries: Operations and Methods;	1

Practical : Python Programming -II LAB

Lecture -15

Credit = 1

1. Write a program that reads an integer value and prints leap year or not a leap year.
2. Write a program to create the following Pattern . For example enter a size: 5 -

```
*
**
***
****
*****
```



3. Write a function that takes an integer n as input and calculates the value of $1 + 1/1! + 1/2! + 1/n!$
4. Write a function that takes an integer input and calculates the factorial of that number,
5. Write a function that takes a string input and checks if it is a palindrome or not.
6. Write a list function to convert a string into a list, as in list (-abc) gives [a, b, c].
7. Write a program to generate Fibonacci series.
8. Write a program to check whether the input number is even or odd.
- 9 . Write a program to compare three numbers and print the largest one.
10. Write a program to print factorial value of a given number.
11. Write a program to to determine whether the number is prime or not.
12. Write a program to create Stack Class and implement all its methods, (Use Lists).
13. Write a program to create Queue Class and implement all its methods, (Use Lists)
14. Write a program to implement linear and binary search on lists,
15. Write a program which will find all such numbers which are divisible by 7.
- 16 . Write a program to check whether a number is palindrome or not.
17. Write a program that accepts a sentence and calculate the number of letters and digits.

Note: The teachers concern can add more program as per requirement.

TEXT BOOKS

- Mark Lutz, Learning Python
- Tony Gaddis, Starting Out With Python
- Kenneth A. Lambert, Fundamentals of Python
- James Payne, Beginning Python using Python 2.6 and Python 3

Reference Book

- Problem Solving using Python – E. Balagurusamy, Mc Graw Hill Education Ltd., 2017
- Practical Programming An Introduction to Computer Science Using Python - Jennifer Campbell
- <https://docs.python.org/3/tutorial/index.html>



GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)



FYUGP (CBCS/LOCF Course)

Department – Computer Science

Session: 2024-25	Program: B.A./B.Sc./B.Com/BCA
Semester: IV	Subject: Computer Science
Course Type: VAC	Course Code:
Course Title:	Cyber Security - II
Credit: 2	Lecture: 30
M.M. 50 = (Internal 10 + Practical Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: 40%

Title	Cyber Security - II
Course Learning Outcome:	<p>After completion of course the students will able to:-</p> <ul style="list-style-type: none"> • Develop skill in Cyber security tools. • Evaluate and communicate the human role in security systems with an emphasis on ethics, social engineering vulnerabilities and training • Interpret and forensically investigate security incidents. • Test and evaluate secure software. • Implement Cyber security solutions. • Be able to use Cyber security, information assurance and Cyber/computer forensics software tool.

Practical : Cyber Security – II LAB

Lecture - 30

Credit = 2

Topic of Practical :-

1. Configuring security settings in Mobile Wallets and UPIs.
2. Checklist for secure net banking.
3. Installation and configuration of computer Anti-virus.
4. Wi-Fi security management in computer and mobile.
5. Managing Application permissions in Mobile phone/computer.
6. Managing system security in mobile phone and computer.
7. Configuring Application lock on mobile phone.
8. Configuration and setting of firewall.
9. Internet Browser security setting.
10. Secure use of Anydesk and Shareit software.
11. How to check website IP address.
12. Identifying harmful cookies.
13. How to remove Virus from System.
14. How to check System IP address.
15. Creating user account, setting permission and protecting files.