दिल्लीविश्वविद्यालय
UNIVERSITY OF DELHI

Bachelor of Arts
Discipline Courses in Computer Applications

(Effective from Academic Year 2019-20)

Revised Syllabus as approved by

Academic Council
Date: No:
Executive Council
Date: No:

Applicable for students registered with Regular Colleges, Non Collegiate Women's Education Board and School of Open Learning

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Preamble

The objective of any programme at Higher Education Institute is to prepare their students for the society at large. The University of Delhi envisions all its programmes in the best interest of their students and in this endeavour it offers a new vision to all its Under-Graduate courses. It imbibes a Learning Outcome-based Curriculum Framework (LOCF) for all its Under Graduate programmes.

The LOCF approach is envisioned to provide a focused, outcome-based syllabus at the undergraduate level with an agenda to structure the teaching-learning experiences in a more student-centric manner. The LOCF approach has been adopted to strengthen students' experiences as they engage themselves in the programme of their choice. The Under-Graduate Programmes will prepare the students for both, academia and employability.

Each programme vividly elaborates its nature and promises the outcomes that are to be accomplished by studying the courses. The programmes also state the attributes that it offers to inculcate at the graduation level. The graduate attributes encompass values related to well-being, emotional stability, critical thinking, social justice and also skills for employability. In short, each programme prepares students for sustainability and life-long learning.

The new curriculum of Discipline Course in Computer Applications is designed to introduce computational methods to BA program students. The course promotes computer literacy and programming skills so that the students can make effective use of computer technology in their courses of study. The program also builds some basic skills for entry level jobs in information technology.

The University of Delhi hopes the LOCF approach of the programme Discipline Course in Computer Applications will help students in making an informed decision regarding the goals that they wish to pursue in further education and life, at large.

1.Introduction to Discipline Course in Computer Applications

Discipline course in Computer Application is offered to BA programme students in several prestigious colleges of the University of Delhi. This course aims to introduce the discipline of Computer Applications to the students who wish to either take up entry level jobs in small scale computer industry or use computer technology in study of Humanities. The courses are designed to promote computer literacy, and use and appreciate computer technology in day-to-day life. Inclusion of programming courses promotes logical and analytical thinking.

The curriculum for Computer Application courses in BA programme was developed by the Department of Computer Science by following the due diligent process. Close consultations were held with the college teachers involved in teaching of the courses. Inputs were collected from the college teachers in general body meetings and the courses were decided. Subsequently, committees were formed for designing syllabi for each course. Draft syllabus of each course was thoroughly discussed and debated among the peers in DU colleges. After multiple iterations, the final syllabus of the programme was approved in the Committee of Courses for Undergraduate Studies. The draft was then published in public domain for review by all stakeholders, and additionally sent for peer review outside University of Delhi. The review comments were thoroughly discussed in the Committee of Courses for Undergraduate Studies, and the appropriate changes were incorporated. Finally, the syllabus was placed in the Faculty of Mathematical Sciences and approved**.**

2.Aims of Discipline Course in Computer Applications

The course familiarizes the students with fundamentals of computers hardware and software. It introduces the basic computer technologies and provides hands-on practice in the use of commonly used software in small scale industry. Thus the course provides skills for entry level jobs. The course also inculcates logical and analytical thinking by way of offering programming languages. Modern programming languages like Python and R are covered, which enable students to move towards digital humanities. Specifically, the program aims the following achievements for students.

1. To attain understanding of computer technology, their applications and fundamentals.
2. To develop ability to apply knowledge of computing to solve computational problems.
3. To analyze a problem, and identify the computing requirements appropriate to its solution.
4. To design, implement, and evaluate a computer-based system, process or program to meet the desired needs.

3. Programme Learning Outcomes for Discipline Course in Computer Applications

After completion of this course a student will be able to:

1. efficiently use Office Automation Tools like word processors, spreadsheets and presentation tools.
2. develop simple programming constructs in a Programming Language (eg. Python)
3. use multimedia authoring tools to design small applications using sound, audio, and video/animation.
4. develop simple websites using HTML/DHTML, CSS and JavaScript programming codes.
5. handle Computer Networks, modems and routers, and efficiently use Internet
6. Develop and implement a simple project based on case studies.

4. Structure of Discipline Course in Computer Applications

4.1 Credit Distribution

Course		Credits
Paper	With Practical	WithTutorial
I. Core Course	12X4= 48	12X5=60
(12 Papers)		
Two papers – English		
Two papers – MIL		
Four papers – Discipline 1.		
Four papers – Discipline 2.		
Core Course Practical / Tutorial	12X2=24	12X1=12
(12 Practicals)		
II. Elective Course	6x4=24	6X5=30
(6 Papers)		
Two papers- Discipline 1 specific		
Two papers- Discipline 2 specific		
Two papers- Inter disciplinary		
Two papers from each discipline of choice		
and two papers of interdisciplinary nature.		
Elective Course Practical / Tutorials	6 X 2=12	6X1=6
(6 Practical/ Tutorials)		
Two papers- Discipline 1 specific		
Two papers- Discipline 2 specific		
Two papers- Generic (Inter disciplinary)		
Two papers from each discipline of choice		
including papers of interdisciplinary nature.		

☐ **Optional Dissertation or project work in place of one elective paper (6 credits) in 6th Semester**

Course	With Practical	WithTutorial
III. Ability Enhancement Courses		
1**. Ability Enhancement Compulsory**	2 X 4 = 8	2 X 4=8
(2 Papers of 4 credits each)		
Environmental Science		
English Communication/MIL		
2**. Ability Enhancement Elective**	4 X 4= 16	4 X 4= 16
(Skill Based)		
(4 Papers of 4 credits each having		
Theory + Practical/Tutorial)		
Total credit	**132**	**132**

Note: Wherever there is a practical there will be no tutorial and vice-versa.

4.2 Semester-wise Distribution of Courses.

SEMESTER	COURSE OPTED	COURSE NAME	CREDITS
I	Ability Enhancement Compulsory Course-I	English/MIL communications/ Environmental Science	4
	Core course-I	English/MIL-1	6
	Core Course-II	DSC-1A	4
	Core course-II Practical/Tutorial	DSC-1A Lab	2
	Core Course-III	DSC 2A (Other Discipline)	6
II	Ability Enhancement Compulsory Course-II	English/MIL communications/ Environmental Science	4
	Core course-IV	English/MIL-1	6
	Core Course-V	DSC-1B	4
	Core course-V Practical/Tutorial	DSC-1B Lab	2
	Core Course-VI	DSC 2B (Other Discipline)	6
III	Core course-VII	English/MIL-2	6
	Core Course-VIII	DSC-1C	4
	Core course-VIII Practical/Tutorial	DSC-1C	2
	Core Course-IX	DSC 2C(Other Discipline)	6
	SkillEnhancementCourse-1 Theory + Practical/Tutorial	SEC-1	4
IV	Core course-X	English/MIL-2	6
	Course-XI	DSC-1D	4
	Core course-XI Practical/Tutorial	DSC-1D	2
	Course-XII	DSC 2D (Other Discipline)	6
	SkillEnhancementCourse-2 Theory + Practical/Tutorial	SEC-2	4
V	Skill Enhancement Course-3 Theory/Practical/Tutorial	SEC-3	4
	Discipline Specific Elective -1	DSE-1A	4
	Discipline Specific Elective -1 Practical/Tutorial	DSE-1A Lab	2

	Generic Elective – 1	GE – 1 - IT Fundamentals	4
	Generic Elective – 1 Practical/Tutorial	GE – 1 – Lab	2
	Discipline Specific Elective	DSE-2A (Other Discipline)	6
VI	Skill Enhancement Course -4 Theory/Practical/Tutorial	SEC-4	4
	Discipline Specific Elective -2	DSE-1B	4
	Discipline Specific Elective -2 Practical/Tutorial	DSE-1B Lab	2
	Generic Elective –2	GE – 2	4
	Generic Elective –2 Practical/Tutorial	GE – 2 – Lab	2
	Discipline Specific Elective	DSE-2B (Other Discipline)	6
Total Credits			132

Discipline Specific Core Papers: (Credit: 06 each)
(DSC-1A, DSC-1B,DSC-1C, DSC-1D)

1. BACS01   Computer Fundamentals

2. BACS02   Database Management Systems

3. BACS03   Computer Networks and Internet Technologies

4. BACS04   Multimedia Systems and Applications

Discipline Specific Elective Papers: (Credit: 06 each)
   Options for DSE-1A, choose one

1. BACS05A   Programming in JAVA
2. BACS05B   Programming with Python

   Options for DSE-1B, choose one

1. BACS06A   Information Security and Cyber Laws
2. BACS06B   Project Work/Dissertation

Skill Enhancement Courses (Credit: 04 each)
(SEC1, SEC2, SEC3, SEC4)

   Options for SEC 1, choose one

1. BACS07A   Word Processing and Presentation Softwares
2. BACS07B   PHP Programming

   Options for SEC 2, choose one

1. BACS08A   Data Handling Using Spreadsheet
2. BACS08B   Web designing Using HTML 5

Options for SEC 3, choose one

1. BACS09AOpen Source Softwares
2. BACS09B   Desktop Publishing

Options for SEC 4, choose one

1. BACS10A   System Administration& Maintenance
2. BACS10B   Android Programming
3. BACS10C   Data Visualization using R

Note

1. The size of the practical group for practical papers is recommended to be 10-15 students.
2. Each practical will carry 50 marks including 25 marks for continuous evaluation and 5 marks for the oral viva.
3. Colleges are advised and encouraged to conduct the practical using Free and Open Source Software (FOSS)
4. At least two questions have to be compulsorily attempted in the final practical examination.
5. Softcopy of all the practical must be maintained by each student for each practical paper.
6. Discipline specific core and elective courses (DSC and DSE) are to be taught as 4 Hrs theory and 4 Hrs practical per week
7. Skill enhancement courses (SEC) are to be taught as 2 Hrs theory and 4 Hrs practical per week
8. Practical given for the courses are only indicative, and by no means exhaustive. Instructor may add more complex problems in laboratory depending on the ability of the students.

5.Discipline Courses in Computer Applications

Computer Fundamentals
(BACS01)
Core Course - (CC) Credit:6

Course Objective

This course provides an overview of introductory concepts about computers, number systems and components of computer system. It builds the foundation of the computer application courses that follow.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. handle a computer system for day to day use.
2. enumerate different types of input/ output devices and types of memory.
3. perform basic arithmetic operations using different number systems including binary arithmetic.
4. differentiate between system and application software.
5. prepare documents / spreadsheets.

Unit 1

Introduction to Computers: Characteristics of computers, uses of computers, components of a digital computer, types of computers.

Unit 2

Number Systems: Binary, Octal and Hexadecimal number systems, Binary Coded Decimals (BCD), Binary Coded Octals (BCO), Binary Coded Hexadecimals (BCH), 1's complement, 2's complement, conversion from one number system to another, binary arithmetic (addition, subtraction), binary subtraction using 2's complement.

Unit 3

Input and Output Devices: Keyboard, mouse, touch screen, joystick, scanner, web camera, MICR, OCR, OMR, bar-code reader, monitor, printer, plotter.

Memory: Primary, secondary, auxiliary memory; RAM, ROM, cache memory, magnetic tape, magnetic disks, hard disk drives, optical disks, CD-R, DVD, flash drives, blue ray disc.

Unit 4

Computer Organization and Architecture: C.P.U., registers, system bus, main memory unit, processors, motherboard, ports and interfaces, expansion cards, ribbon cables, SMPS, memory chips.

Unit 5

Software: System software, application software, operating system and its functions and types.

Unit 6

Overview of Emerging Technologies: Bluetooth, cloud computing, big data, data mining, mobile computing.

Practical

Practical exercises based on MS Word/Open Office tools using document preparation and spreadsheet handling packages.

Text Editor

1. Prepare a grocery list having four columns (without table, using tab) (Serial number, Name of the product, Quantity and Price) for the month of March, 19.

    - Font specifications for Title (Grocery List): 14-point Arial font in bold and italics.
    - The headings of the columns should be in 12-point and bold.
    - The rest of the document should be in 10-point Times New Roman.
    - Leave a gap of 12-points after the title.

2. Create a telephone directory having 2 columns.
    - The heading should be 16-point Arial Font in bold
    - The rest of the document should use 10-point font size
    - Other headings should use 10-point Courier New Font.
    - The footer should show the page number as well as the date last updated.

3. Design a time-table form for your college.
    - The first line should mention the name of the college in 16-point Arial Font and should be bold.
    - The second line should give the course name/teacher's name and the department in 14-point Arial.
    - Leave a gap of 12-points.
    - The rest of the document should use 10-point Times New Roman font.
    - The footer should contain your specifications as the creator and date of creation.

4. BPB Publications plans to release a new book designed as per your syllabus. Design the first page of the book as per the given specifications.
    - The title of the book should appear in bold using 20-point Arial font.
    - The name of the author and his qualifications should be in the center of the page in 16-point Arial font.
    - At the bottom of the document should be the name of the publisher and address in 16-point Times New Roman.
    - The details of the offices of the publisher (only location) should appear in the footer.

5. Create the following one page documents.
    a. Compose a note inviting friends to a get-together at your house, Including a list of things to bring with them.
    b. Design a certificate in landscape orientation with a border around the document.
    c. Design a Garage Sale sign.

     d.   Make a sign outlining your rules for your bedroom at home, using a numbered list.

6.   Create the following documents:

     (a) A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.
     (b) Use a newsletter format to promote upcoming projects or events in your classroom or college.

7.   Convert the given text to a table, using comma as delimiter

8.   Enter the data into a table given below for 10 salespersons

Salesperson	Dolls	Trucks	Puzzles

Add a column Region (values: S, N, N,S,S,S) between the Salesperson and Dolls columns to the given table Sort your table data by Region and within Region by Salesperson in ascending order:

Add a new row to the table, place the word "Total" at the bottom of the Salesperson column, and sum the Dolls, Trucks, and Puzzles columns.

9.   Create a document with wrapping of text around the image.

Spreadsheet

1.   Enter the data in Excel worksheet for 5 different states in the format given below:

REGIONAL SALES PROJECTION

State	Qtr1	Qtr2	Qtr3	QTR4	Qtr Total	Rate	Amount

Total average

(a) Apply Formatting as follow:
    I.   Title in TIMES NEW ROMAN
    ii.   Font Size - 14
    iii.   Remaining text - ARIAL, Font Size -10
    iv.   State names and Qtr. Heading Bold, Italic with Gray Fill Color.
    v.   Numbers in two decimal places.
    vi.   Qtr. Heading in center Alignment.
    vii. Apply Border to whole data.
    (b) Calculate State and Qtr. Total
    (c) Calculate Average for each quarter
    (d) Calculate Amount = Rate * Total.

2. Given the following worksheet for 10 different students in the format given below:

Roll No.	Name	Marks	Grade

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
>= 80	A+
>= 60 < 80	A
>= 50 < 60	B
< 50	F

3. Enter the data for 8 different salesmen in a worksheet in the format given below:

	A	B	C	D	E	F	G
1	Salesman			Sales in (Rs.)			
2	No.	Qtr1	Qtr2	Qtr3	Qtr4	Total	Commission

Calculate the commission earned by the salesmen on the basis of the following criteria:

If Total Sales	Commission
< 20000	0% of sales
> 20000 and < 25000	4% of sales
> 25000 and < 35000	6% of sales
> =35000	8% of sales

The total sales is sum of sales of all the four quarters.

4. A company XYZ Ltd. pays a monthly salary to its employees which consists of basic salary, allowances & deductions. The details of allowances and deductions are as follows:

Allowances

- HRA Dependent on Basic
   - 30% of Basic, if Basic <=1000
   - 25% of Basic, if Basic>1000 & Basic<=3000
   - 20% of Basic, if Basic >3000
- DA Fixed for all employees, 30% of Basic
- Conveyance Allowance   Rs. 50/- if Basic is <=1000
   - Rs. 75/- if Basic >1000 & Basic<=2000
   - Rs. 100 if Basic >2000
   - Entertainment Allowance NIL, if Basic is <=1000
   - Rs. 100/- if Basic > 1000

Deductions

- Provident Fund   6% of Basic
- Group Insurance Premium   Rs. 40/-, if Basic is <=1500
   - Rs. 60/-, if Basic > 1500 & Basic<=3000
   - Rs. 80/-, if Basic >3000

Calculate the following:

Gross Salary= Basic + HRA + DA + Conveyance + Entertainment

Total deduction = Provident Fund + Group Insurance Premium

Net Salary   = Gross Salary – Total Deduction

5. Use an array formula to calculate Simple Interest for given five principal amounts given the rate of Interest and time

    Rate of Interest   8%
    Time   5 Years
    S.No.   Principal   Simple Interest

6. The given worksheet consists of year wise sale figure of five salesmen in Rs.

    Salesman   2000   2001   2002   2003

    (a) Calculate total sale year wise.
    (b) Calculate the net sale made by each salesman
    (c) Calculate the maximum sale made by the salesman
    (d) Calculate the commission for each salesman under the condition.
        (i) If total sales >4,00,000, give 5% commission on total sale made by the salesman.
        (ii) Otherwise, give 2% commission.
    (e) Draw a bar graph representing the sale made by each salesman.
    (f) Draw a pie graph representing the sale made by salesman in 2000.

7. Enter the data in an Excel Sheet according to the format given below:

PERSONAL BUDGET FOR FIRST QUARTER

Monthly Income (Net): 1,475

EXPENSES   JAN   FEB   MARCH QUARTER QUARTER TOTAL   AVERAGE
Rent
Telephone
Utilities
Credit Card
Oil
AV to Insurance
Cable TV
Monthly Total

    (a) Calculate Quarter total and Quarter average.
    (b) Calculate Monthly total.
    (c) Surplus = Monthly income - Monthly total.
    (d) What would be total surplus, if monthly income is 1500.
    (e) How much does telephone expense for March differ from quarter average.
    (f) Create a 3D column graph for telephone and utilities.
    (g) Create a pie chart for monthly expenses.

9. Enter the data in an Excel Sheet according to the format given below for 5 different publishers:

TOTAL REVENUE EARNED FOR SAM'S BOOKSTALL

Publisher name	1997	1998	1999	2000	Total

(a) Compute the total revenue earned.

(b) Plot the line chart to compare the revenue of all publishers for 4 years.

(b) Chart Title should be 'Total Revenue of Sam's Bookstall (1997-2000)'

(c) Give appropriate categories and value axis title.

10. Generate 25 random numbers between 0 & 100 and find their sum, average and count. How many no. are in range 50-60

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2. Thareja, R. (2014). *Fundamentals of Computers*. Oxford University Press.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1	Introduction to Computers: Characteristics of computers, uses of computers, components of a digital computer, types of computers.
2	Introduction to Computers: Components of a digital computer. Number Systems: Introduction to binary and octal number systems.
3	Number Systems: Introduction to hexadecimal number system, Binary Coded. Decimals BCD), Binary Coded Octals (BCO), Binary Coded Hexadecimals (BCH).
4	Number Systems: 2's complement form, conversion from one number system to another.
5	Number Systems: Conversion from one number system to another (cont ..), Binary arithmetic (addition).
6	Number Systems: Binary arithmetic (subtraction), binary subtraction using 2's complement. Input and Output Devices: Keyboard, mouse, touch screen, joystick, scanners,

	web camera, MICR, OCR, OMR.
7	Input and Output Devices (cont..): Bar-code reader, monitors, printers, plotters Memory: Primary, secondary, auxiliary memory.
8	Memory: RAM, ROM, cache memory, magnetic tape, magnetic disks, hard disk drives, optical disks, CD-R, DVD.
9	Memory: Flash drives, blue ray disc. Computer Organization and Architecture: CPU, registers, system bus, main memory unit.
10	Computer Organization and Architecture: Processors, motherboard, ports and interfaces, expansion cards, ribbon cables,
11	Computer Organization and Architecture: SMPS, memory chips. Software: Application software.
12	Software: System software, Introduction to the concept of operating system.
13	Software: Functions and types of operating systems.
14-15	Overview of Emerging Technologies: Bluetooth, cloud computing, big data, data mining, mobile computing.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Digital computer, Number Systems, Input and Output Devices, Computer Memory

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Database Management Systems (DBMS)
(BACS02)
Core Course - (CC) Credit:6

Course Objective

The course introduces the students to the fundamentals of database management system and the methods to store and retrieve data. It enables the student to understand, how data is organized for efficient storage and retrieval.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. differentiate between database systems and file systems.
2. describe the features of database management systems.
3. analyze the problem and arrive at an information model in the form of an ER diagram.
4. normalize a database.
5. transform an ER model into a relational database schema.

6. use SQL for query and data update operations.

Unit 1

Database: Introduction to database and DBMS, DBMS architecture, data independence, components of database systems, front end tools.

Unit 2

E-R Modeling: Entity types, entity set, attribute and key, relationships, relation types, ER diagrams, Database design using ER diagrams.

Unit 3

Relational Data Model: Relational model concepts, relational constraints, primary key, foreign key, candidate key, alternate key, composite key, super key.

Unit 4

Normalization: Functional dependencies, First, Second and Third normal forms

Unit 5

Introduction to Structured Query Language: Overview of SQL query language, Data definition and manipulation languages, set operations.

Unit 6

SQL: Create database, create table, drop database, drop table, alter table, create relationships between database tables, auto increment, check, Null values, aggregate functions - min, max, count, average, sum, nested sub-queries, insert data into table, modify and manage tables, queries, modify, filter, delete and view data, group by, having, exists, case, order by, Join operations - inner, left join, right join, natural join, Cartesian product.

Practical
Practical List for DBMS:

1. Create a database having two tables with the specified fields, to computerize a library system of a Delhi University College.
   LibraryBooks (Accession number, Title, Author, Department, PurchaseDate, Price)
   IssuedBooks (Accession number, Borrower)

   a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
   b) Delete the record of book titled "Database System Concepts".
   c) Change the Department of the book titled "Discrete Maths" to "CS".
   d) List all books that belong to "CS" department.
   e) List all books that belong to "CS" department and are written by author "Navathe".
   f) List all computer science books (Department="CS") that have been issued.
   g) List all books which have a price less than 500 or purchased between "01/11/2018" and "01/01/2019".

h) Delete the book with accession number 1211.

2. Create a database having three tables to store the details of students of Computer Department in your college.

   Personal information about Student (College roll number, Name of student, Date of birth, Address, Marks(rounded off to whole number) in percentage at $10 + 2$, Phone number)
   Paper Details (Paper code, Name of the Paper)
   Student's Academic and Attendance details (College roll number, Paper code, Attendance, Marks in home examination).

   a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
   b) Design a query that will return the records (from the second table) along with the name of student from the first table, related to students who have more than 75% attendance and more than 60% marks in paper 2.
   c) List all students who live in "Delhi" and have marks greater than 60 in paper 1.
   d) Find the total attendance and total marks obtained by each student.
   e) List the name of student who has got the highest marks in paper 2.
   f) Update the name of the paper with Paper code "P1" from "Introduction to Computers" to "Computer Science Fundamentals".

3. Create the following tables and answer the queries given below:
   Customer (CustID, Email, Name, Phone, AlternatePhone, ReferrerID)
   Bicycle (BicycleID, DatePurchased, Color, CustID, ModelNo)
   BicycleModel (ModelNo, Manufacturer, Style)
   Service (StartDate, BicycleID, EndDate)

   a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
   b) Delete the column AlternatePhone from the Customer table.
   c) List all the customers who have the bicycles manufactured by manufacturer "Honda".
   d) List the bicycles purchased by the customers who have been referred by customer "C1".
   e) List the manufacturer of red colored bicycles.
   f) List the models of the bicycles given for service.

4. Create the following tables, enter at least 5 records in each table and answer the queries given below.
   Employee (Employee_ID, Person_Name, Street, City)
   Works (Employee_ID, Company_ID, Salary)
   Company(Company_ID, Company_Name, City)
   Manages (Employee_ID, Manager_ID)

   a) Identify primary and foreign keys.
   b) Alter table employee, add a column "Email" of type varchar(20).
   c) Find the name of all managers who work for both Samba Bank or NCB Bank.
   d) Find the names, street address and cities of residence and salary of all employees who work for "Samba Bank" and earn more than Rs.10,000.
   e) Find the names of all employees who live in the same city as the company for which they work.
   f) Find the highest salary, lowest salary and average salary paid by each company.
   g) Find the sum of salary and number of employees in each company.

h) Find the name of the company that pays the highest payroll.

5. Create the following tables, enter at least 5 records in each table and answer the queries given below.

   Suppliers (SNo, Sname, Status, SCity)
   Parts (PNo, Pname, Colour, Weight, City)
   Project (JNo, Jname, Jcity)
   Shipment (Sno, Pno, Jno, Quantity)

a) Identify primary and foreign keys.
b) Get supplier numbers for suppliers in Paris with status greater than 20.
c) Get suppliers details for suppliers who supply part P2. Display the supplier list in increasing order of supplier numbers.
d) Get suppliers names for suppliers who do not supply part P2.
e) For each shipment get full shipment details, including total shipment weights.
f) Get all the shipments where the quantity is in the range 300 to 750 inclusive.
g) Get part nos. for parts that either weigh more than 16 pounds or are supplied by suppliers S2, or both.
h) Get the names of cities that store more than two red parts.
i) Update the city of S1 supplier to "Delhi".
j) Get part numbers for part supplied by a supplier in Allahabad to a project in Chennai.

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Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain selected topics.
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1	Introduction: Database System Applications, purpose of Database Systems, View of data, Database Languages, front end tools.
2	Introduction: Data independence - Logical and physical data independence, relational databases, database design, database architecture, database users and administrators.
3	Introduction to the Relational model: Structure of relational databases, database schema, keys- primary, foreign, candidate, super keys, schema diagrams.
4	Relational Data Model: Relational model concepts, relational constraints.
5	Normalization: 1NF, 2NF, 3NF, BCNF.
6	Database Design and ER Model: Overview of design process, ER model, constraints.
7	Database Design and ER Model: ER Diagrams, mapping of ER model to relational schema.
8	Introduction to Structured Query Language: Overview of SQL query language, SQL Data definition, structure of SQL queries, operations, set operations.
9	SQL: Create database, create table, drop database, drop table, alter table.
10	SQL: Create relationships between database tables, auto increment, check.
11	SQL: Null values, aggregate functions - min, max, count, average, sum, nested sub-queries.
12	SQL: Modify and manage tables, queries, modify, filter, delete and view data.
13	SQL: Join operations - inner, left join, right join, natural join, Cartesian product.
14-15	SQL: Group by, having, exists, case, order by.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

DBMS architecture, Data Independence, Entity modeling, Relational Data Model, SQL, Normalization

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Computer Networks and HTML
(BACS03)
Core Course - (CC) Credit:6

Course Objective

This course provides an overview of the fundamental concepts of computer networks, data communication, network topologies, web technologies and internet applications.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. enumerate various network topologies and identify situations when different network topologies would be useful.
2. distinguish between LAN, MAN, WAN.
3. distinguish between Intranet, Extranet and Internet.
4. describe client-server architecture.
5. enumerate different transmission media and describe the use of each of them.
6. design web pages using HTML.

Unit 1

Overview of Computer Networks: Introduction to computer networks, classification of computer networks: LAN (Local Area Network), MAN (Metropolitan Area Network), WAN (Wide Area Network), WLAN (Wireless LAN), Intranet, Extranet and Internet.

Networks Topology: mesh, tree and star, ring and bus.

Network Devices: Repeater, hub, bridge, switch, gateway, router, Network Interface Card (NIC).

Unit 2

Network Reference Models: ISO-OSI reference model with description of its layers and functionalities, TCP/IP reference model with description of its layers and functionalities, network addressing IPV4, IPV6.

Unit 3

Data Communication Fundamentals: Analog and digital signals.

Transmission Media: Guided Media - twisted pair, coaxial cable, and optical fibre (only their basic properties and differences). Unguided media - radio wave, terrestrial microwave, satellite microwave, transmission impairments.

Unit 4

HTML : Introduction to web page, home page, website, domain name system, www, URL, internet browsers, web server, downloading and uploading of files, web page design using HTML, ISP. Introduction to hypertext mark-up language (html), Document type definition, creating web pages, lists, hyperlinks, tables, web forms, inserting images, frames, hosting options and domain name registration. Customized Features: Cascading style sheet (CSS) for text formatting and other manipulations.

Unit 5

Internet Applications: Telnet, ftp, e-mail, search engines, social networks, video conferencing, e-Commerce, m-Commerce, e-wallet.

Unit 6

Network Tools: Ping, ipconfig, ifconfig, tracert, arp. netstat, whois.

Practical
Practical exercises based on HTML.

1. Create HTML document with following formatting – Bold, Italics, Underline, Colors, Headings, Title, Font and Font Width, Background, Paragraph, Line Brakes, Horizontal Line, Blinking text as well as marquee text.
2. Create HTML document with Ordered and Unordered lists, Inserting Images, Internal and External linking
3. Create HTML document with Table:

4. Create Form with Input Type, Select and Text Area in HTML.
5. Create an HTML containing Roll No., student's name and Grades in a tabular form.
6. Create an HTML document (having two frames) which will appear as follows:

About	This frame would show the contents according to the link clicked by the user on the left frame.
Department 1	
Department 2	
Department 3	

7. Create an HTML document containing horizontal frames as follows:

Department Names (could be along with Logos)
Contents according to the Link clicked

8. Create a website of 6 – 7 pages with different effects as instructed in the laboratory session.
9. Create HTML documents (having multiple frames) in the following formats:

Frame1
Frame2

Frame1	
Frame2	Frame3

10. Create a form using HTML which has the following types of controls:
    I.   Text Box
    II. Option/radio buttons
    III. Check boxes
    IV. Reset and Submit buttons

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[Reset] [Send it in!]

11. Create a static web page using HTML to show the following table on the screen with 4 different entries

Specification table with hours and marks

No	Title	Teaching hours	Distribution of Marks		
			A level	B Level	Total
I					
II					
III					
IV					

12. Print 10 names with a line break between each name. The list should be alphabetized, and to do this place a subscripted number next to each name based on where it will go in the alphabetized list. (Example: Alan1). Print first, the un-alphabetized list with a subscript number next to each name, then the alphabetized list. Both lists should have an <h1> level heading.
13. Create Form with Input Type, Select and Text Area in HTML.
14. Create a web page using list tags of HTML to show the following information on web page.

HTML List: Ordered,Unordered & Definition List

Following is the list of proposed student activities like:

1. Develop programs related with unit vice topics in computer laboratory.
2. Develop any module of to be useful in real life application.
3. Multimedia presentation of module developed by students.

List of Software/Learning Websites

- ASP Tutorial - W3Schools
  www.w3schools.com/asp
- Classic ASP Tutorials & Articles - Web Wiz
  www.webwiz.co.uk - Knowledgebase
- HTML Tutorial - W3Schools
  www.w3schools.com/html
- CSS Tutorial
  www.csstutorial.net
- VBScript Tutorial - Tutorials Point
  www.tutorialspoint.com/vbscript/index.htm
- ADO Tutorial - W3Schools
  www.w3schools.com/ADO/default.asp

HTML
  Hyper Text Markup Language
XML
  eXtensible Markup Language

References

1. Forouzan, B. A. (2013). *Data Communication and Networking* (5th Edition). TMH.
2. Powell, T. A. (2010). *HTML & CSS: The Complete Reference* (5th Edition). Tata McGraw-Hill.

Additional Resources

1. Duckett, J. (2011). *HTML and CSS: Design and Build Websites*. (1st Edition). Wiley.
2. Tanenbaum, A. S. (2013). *Computer Networks* (5th Edition). Pearson Education India.

Teaching Learning Process

- Talk and chalk method
- Computer based LCD presentations by teachers
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning

Tentative weekly teaching plan is as follows:

Week	Topics
1.	Overview of Computer Networks: Introduction to computer networks, data communication fundamentals and the components of data communication, data transmission modes, LAN (Local Area Network), MAN (Metropolitan Area Network), WAN (Wide Area Network), WLAN(Wireless LAN), Intranet, Extranet and Internet.
2.	Network Models: Client/ server network and peer-to-peer network, introduction to the concept of network models. ISO-OSI reference model with description of its layers and functionalities.
3.	Network Models: ISO-OSI reference model with description of its layers and functionalities, TCP/IP reference model with description of its layers and functionalities.
4.	Network Models: Comparison of ISO-OSI and TCP/IP reference model. Networks Topology: mesh, tree and star, ring and bus.
5.	Transmission Media: Introduction, Guided Media: twisted pair, coaxial cable, and optical fiber (only their basic properties and differences). Unguided media: radio wave, terrestrial microwave, satellite microwave, transmission impairments.
6.	Network Devices: Repeaters, hub, bridge, switch, gateway, router, Network Interface Card (NIC).
7.	Addressing: IPv4, IPv6. Web Technology: Web page, home page, website, internet browsers, URL, hypertext, ISP, web server.
8.	Web Technology: Downloading and uploading of files, domain name system. Network Tools: Ping, ipconfig, ifconfig, tracert, arp. netstat, whois.
9.	Internet Applications: Telnet, ftp, e-mail, www, search engines, e-Commerce, m-Commerce, e-wallet.

10.	**Internet Applications:** Social networks, video conferencing. **Introduction to HTML :** Introduction to hypertext markup language (html) Document type definition, creating web pages
11. -12	**HTML:** Inserting images, hyperlinks, tables, lists.
13.	**HTML:** web forms.
14.	**HTML:** Frames.
15.	**HTML:** Hosting options and domain name registration. Customized Features: Cascading style sheet (CSS) for text formatting and other manipulations.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Networks Topology, Signal and Bandwidth, ISO-OSI reference mode, Web Technology

Multimedia Systems and Applications
(BACS04)
Core Course - (CC) Credit:6

Course Objective

The course provides an overview of fundamentals of multimedia systems. The students will be taught how to represent, process and retrieve multimedia data such as text, images, sound, video and animation.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. enumerate and describe the multimedia components.
2. generate, manipulate and use images in multimedia projects using bitmap, vector and 3-D images.
3. create basic animations.

Unit 1

Multimedia: Introduction to multimedia, multimedia components, uses of multimedia, multimedia applications, virtual reality.

Unit 2

Text: Fonts and faces, using text in multimedia, font editing and design tools, hypermedia and hypertext.

Unit 3

Images: Still images – bitmaps, vector drawing, 3D drawing and rendering, natural light and colors, computerized colors, color palettes, image file formats.

Unit 4
Sound, Video and Animation: Digital audio, MIDI audio, MIDI vs digital audio, audio file formats, how video works, analog video, digital video, video file formats, video shooting and editing, principles of animation, animation techniques, animation file formats.

Unit 5

Internet and Multimedia: WWW and HTML, multimedia on the web – web servers, web browsers, web page makers and site builders.

Unit 6

Making Multimedia: Stages of a multimedia project, requirements to make good multimedia.Hardware peripherals - connections, memory and storage devices, multimedia software and authoring tools.

Practical
Practical list of Multimedia:

1.Create an animation using the tools panel and the properties panel to draw the following –

Line, pe , oval, circle, rectangle , square, pencil , brush , lasso tool

2. Create an animation using text tool to set the font , size , color etc.

3. Create an animation using Free transform tool that should use following:

Move Objects

Skew Objects

Stretch Objects

Rotate Objects

Stretch Objects while maintaining proportion

Rotate Objects after relocating the center dot

4. Create an animation using layers having following features

Insert layer, Delete layer, guide layer, Mask layer.

5. Modify the document (changing background color etc.) using the following tool

    Eraser tool

    Hand tool

    Ink bottle tool

Zoom tool

Paint Bucket tool

Eyedropper tool

6. Create an animation for bus car race in which both starts from the same point and car wins the race.

7. Create an animation in which text Hello gets converted into GoodBye (using motion/shape tweening).

8. Create an animation having five images having fade-in fade-out effect.

9. Create an scene to show the sunrise (using multiple layers and motion tweening).

10. Create an animation to show the ripple effect.

11. Create an animation (using Shape tweening and shape hints) for transforming one shape into another.

12. Create an animation for bouncing ball (you may use motion guide layer).

Project :

 Design a minimum 10 page interactive website using Joomla or WordPress

References

1.   Vaughan, T. (2017). *Multimedia: Making It Work* (9th edition). McGraw Hill Education.

Additional Resources

1. Andleigh, K.., & Thakkar, K. (2015). *Multimedia System Design* (1st edition). Pearson Education India.
2. Keyes, J. (2000). *The Ultimate Multimedia Handbook*. TMH.
3. Steinmetz, R., & Naharstedt, K. (2012). *Multimedia Computing, Communications Applications*. Pearson.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics

1	Multimedia: Introduction to multimedia, components, uses of multimedia, multimedia applications, virtual reality
2	Text: Fonts and faces, using text in multimedia, font editing and design tools, hypermedia and hypertext.
3	Images: Still images – bitmaps, vector drawing, 3D drawing and rendering.
4	Images (contd.): Natural light and colors, computerized colors, color palettes, image file formats.
5	Sound, Video and Animation: Digital Audio, MIDI audio, MIDI vs digital audio.
6	Sound, Video and Animation (contd.): Audio file formats, how video works, analog video, digital video.
7	Sound, Video and Animation (contd.): Video file formats, video shooting and editing.
8	Sound, Video and Animation (contd.): Principles of animation, animation file formats.
9	Sound, Video and Animation (contd.): Animation techniques.
10	Internet and Multimedia: WWW and HTML, Multimedia on the web.
11	Internet and Multimedia (contd.): Web servers, web browsers, web page makers and site builders.
12	Making Multimedia: Stages of a multimedia project, requirements to make good multimedia.
13	Making Multimedia (contd.): Hardware peripherals - connections, memory and storage devices.
14-15	Making Multimedia (contd.): Multimedia software and authoring tools.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Hypermedia, Hypertext, Bitmap, Video, Animation, HTML

Programming in Java
(BACS05A)
Discipline Specific Elective - (DSE-I) Credit:6

Course Objective

This course will introduce students to the fundamentals of computer programming in an object oriented framework using Java as programming language.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. understand the concepts of object-oriented software design.
2. develop, compile and run Java programs using basic programming constructs.
3. use object-oriented software design principles like inheritance and polymorphism .
4. use visibility modifiers (public, private, protected) to implement appropriate abstraction and encapsulation.

Unit 1

Introduction to Java programming: Java development environment, Java program structure.

Unit 2

Java Programming Constructs: Data types, variables, constants, scope and life time of variables, operators, expressions, type conversion and casting, control flow, conditional statements, loops, break and continue statements, arrays, command line arguments, methods.

Unit 3

Classes and Objects: Class, object, constructor, destructor, parameter passing, static fields and methods, access control, this reference, overloading of methods and constructors, garbage collection, accessibility modifiers.

Unit 4

OOPS concepts: Encapsulation, inheritance, polymorphism, dynamic binding, dynamic method dispatch, method overriding, final classes and methods, abstract classes and methods.

Practical
Practicals based on Java:

1. Write a java program to add, subtract, multiply and divide any two numbers entered by the user.
2. Write a java program to compute the square, cube of a number entered by a user using methods.
3. Write a java program to demonstrate the use of :
    a. Bitwise operators.
    b. Shift operators.
4. Write a java program to compute maximum of three numbers:
    a. Using ternary operator.
    b. Using if-else statement.
5. Write a menu driven program(using switch-case) which accepts a number as user input :
    a. Checks whether the number is even or odd
    b. Checks whether the number is prime
6. Write a menu driven program(using switch-case) which accepts a number as user input:
    a. Prints sum of digits of the given number
    b. Prints reverse of the given number
7. Write a program to display the first n terms of a Fibonacci series.
8. Write a method to compute the factorial of a number. Use this method to compute the sum of the series: $1 + x/1! + x^2/2! + x^3/3! + \ldots x^n/n!$

9. Write a java program that accepts a list of elements from the user in an array. Calculate the sum and average of the numbers entered. Accept the size of the array as command line argument.

10. Write a java program that accepts a list of elements from the user in an array and displays the elements in the ascending order.

11. Write a java program to create a class "Student" having:
    a. Data members: RollNo, Name, Course
    b. Methods: getData()-To retrieve values of data members
       displayData()-To display values of data members

12. Write a java program to create a class "Room" having:
    a. Data members: Length, Breadth, Height as dimensions of the room
    b. Three constructors:
        i. Having no parameter -that accepts values of data members from the user.
        ii. Having one parameter –which specifies the same value of all dimensions.
        iii. Having three parameters-which passes different values of all dimensions.

13. Write a java program to create a class "Student" having:
    a. Private Data members: RollNo, Name, Marks1, Marks2,Marks3
    b. Constructor: -To assign values to data members
    c. Methods: -
        i. CalculatePercentage()-To calculate percentage of marks
        ii. CalculateDivision()- calculates division based on formula:
            a) Ist Div if percentage is >60
            b) IInd Div if percentage is between 50 and 60
            c) IIIrd Div if percentage is <50
        iii. displayMarksheet()-To display values of data members as well as percentage and division of student

14. Write a java program that calculates the area of circle, rectangle and triangle using method overloading

15. Create a class Employee containing information about employees of same organization. It should have following data members:
    a. EmpId (Private),
    b. CompanyName(static and final)
    c. No-of-employees (static)

    It should have a static method to calculate no. of employees in the organisation based on the number of objects of employees created and a display() method to display Number of employees in that organization.

16. Create a Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain the respective information in the classes and create and display objects of these two classes using Runtime Polymorphism.

17. Create a Circle class having data member radius. Create a subclass of circle called Cylinder having data members: radius and height. Both classes should have a method called area() that calculates their area.

18. Create an abstract class called shape having abstract method area() and two variables dimension1 and dimension2. Create two subclasses of shape, rectangle and triangle class which implement the method area().

References

1. Deitel, P., & Deitel, H. (2016). *Java How to Program* (10th Edition). Pearson.

2. Schildt, H. (2014). *Java The Complete reference* (9th Edition). Tata Mc Graw Hill.

Additional Resources

1. Balagurusamy, E. (2009). *Programming with Java: A primer* (4th Edition). Tata Mc Graw Hill.

2. Horstmann, C. S. (2016). *Core Java Volume 1-Fundamentals* (10th Edition). Pearson Education.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1	Introduction to Java programming: Java development environment, Java program structure.
2	Java Programming Constructs: Data types, variables, constants, scope and life time of variables.
3	Java Programming Constructs (contd.): Operators, expressions.
4	Java Programming Constructs (contd.): Type conversion and casting, control flow, conditional statements.
5	Java Programming Constructs (contd.): Looping constructs, break and continue statements.
6	Java Programming Constructs (contd.): Arrays, command line arguments, methods.
7	Classes and Objects: Classes and Objects.
8	Classes and Objects (contd.): Constructors and constructor, overloading.
9	Classes and Objects (contd.): Methods, parameter passing, static fields and methods, this reference.
10	Classes and Objects (contd.): Overloading methods, garbage collection.
11	Classes and Objects (contd.): Access control and accessibility modifiers.
12	OOP concepts: Inheritance, encapsulation, polymorphism.
13	OOP concepts (contd.): Dynamic binding, dynamic method Dispatch, method overriding.
14-15	OOP concepts (contd.): Final classes and methods, abstract classes and methods.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Object Oriented Programming, Overloading, Inheritance, Data abstraction, Encapsulation

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Programming in Python
(BACS05B)
Discipline Specific Elective - (DSE-I) Credit:6

Course Objective

The course introduces programming in Python and develop Python based solutions for simple problems.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. select a suitable programming construct and inbuilt data structure for a situation.
2. develop and document modular python programs.
3. use classes and objects in application programs.

Unit 1

Introduction to Python: Structure of a Python program, Python interpreter/Python shell, identifiers and keywords, literals, strings, basic operators, input, output statements, Python standard libraries, notion of class, object.

Unit 2

Functions: Built in functions, function definition and calls, default parameter values.

Creating Python Programs: Input and output statements, control statements - branching, looping, exit function, break, continue, and pass, mutable and immutable structures, strings, lists, tuples and associated operations.

Unit 3

Control Structures: conditional statements, loops, exit, break and continue statements.

Unit 4

Classes: classes, objects and methods.

Unit 5

List and functions: list comprehension: shorthand notation for creating lists, passing lists as arguments, copying list objects,
Tuples: tuples and associated operations.
Dictionaries

Practical
Practicals based on Python:

1. Write a program to check whether the input number is even or odd.
2. Write a program that reads an integer value and prints "leap year" or "not a leap year".
3. Write a program to compare three numbers and print the largest one.
4. Write a program to print factors of a given number.
5. Write a method to calculate GCD of two numbers.
6. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria

    Grade A: Percentage >=80
    Grade B: Percentage>=60
    Grade C: Percentage>=40 and
    Grade D< =40

7. Using for loop and while loop , print a table of feet/centimeter equivalences. Let f be the height in feet ranging from 5 to 6 ft in step of 0.1ft. For each value of f, print the corresponding height in centimeter.
8. Write a program to add N natural numbers and display the total.
9. Write a program that takes a positive integer n and then produces n lines of output shown as follows.
    For example enter a size: 5

            *
            **
            ***
            ****
            *****

10. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.

11. Write a function that takes an integer 'n' as input and calculates the value of
    $1 + 1/1! + 1/2! + 1/3! + … + 1/n$
12. Write a function that takes an integer input and calculates the factorial of that number.
13. Write a program to generate Fibonacci series.
14. Write a function that takes a string input and checks if it's a palindrome or not.
15. Write a list function to convert a string into a list, as in list ('abc') gives [a, b, c].
16. Write a program to implement linear and binary search on lists.
17. Write a program to sort a list using insertion sort.

References

1. Downey, A. B. (2015). *Think Python–How to think like a Computer Scientist* (2nd Edition). O'Reilly.
2. Severana, O. C. (2018). *Python for Everybody (Exploring Data in Python 3).* Shroff Publisher.

Additional Resources

1.Dromey, R.G (2006). *How to Solve it by Computer.* Pearson.
2.Guttag, J. V. (2016). *Introduction to computation and programming using Python.* MIT Press.
3.Liang, Y. D. (2013). *Introduction to programming using Python.* Pearson.
4.Taneja, S., & Kumar, N. (2017). *Python Programming- A modular Approach.* Pearson.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1	Introduction to Python Structure of a Python program, understanding Python interpreter/Python shell.
2	Introduction to Python (contd..) Identifiers and keywords, literals, Python data types, Operators: arithmetic operator.
3	Introduction to Python (contd..) Relational operators, logical operators, Python standard libraries, variables and assignment statements.
4	Introduction to Python (contd..) Notion of class, object.
5	Functions Built-in functions such as input and print, function definition and call, default parameter values.
6	Creating Python Program: Input and output statements, control statements - branching, looping.
7	Creating Python Program (contd..): Exit function, break, continue and pass, mutable and immutable structures, strings, tuples.

8	Control Structures : If statement, for loop.
9	Control Structures (contd..) While loop, exit function, break and continue statements.
10	Classes: Introduction to class, object, and method.
11	Strings Introduction to Strings, built-in functions on strings.
12	Lists: Concept of mutable and immutable structures, Introduction to lists, functions: list, append, count, extend, remove, index and pop.
13-14	Lists (contd..) : List functions: insert, reverse, sort and reverse, list comprehension: shorthand notation for creating lists, passing lists as arguments, copying list objects
15	Tuples: Tuples and associated operations Dictionaries: Introduction to dictionary.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Problem Solving, Classes, Lists, Tuples.

Information Security and Cyber Laws (IS & CL) (BACS06A) Discipline Specific Elective - (DSE-II) Credit:6

Course Objective

The course aims to introduce the cyber threats, issues in information security and contemporary cyber laws.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. enumerate issues in computer security.·
2. enumerate and describe common forms of attacks.
3. describe the importance of security policy in the security framework.
4. describe security related terms like cryptography, privacy, steganography.
5. describe the need for cyber laws, and important provisions of IT Act.

Unit 1

Introduction: Protection, security, risk, threat, flaw, vulnerability, exploit, attack, confidentiality,integrity, availability, non-repudiation, authentication, authorization, codes, ciphers, substitution cipher (Caesar), transposition cipher (Rail-Fence), public and private key cryptography, cyber forensics.

Unit 2

Risk Analysis and Threat: Risk analysis, key principles of conventional computer security, security policies, authentication, data protection, access control, internal vs external threat, security assurance, passwords, computer forensics and incident response.

Unit 3

Cyber Attacks and Digital Crime: DoS attack, man-in-the-middle attack, phishing attack, spoofing attack, spam attack, drive-by attack, password attack, SQL injection attack, cross-site scripting attack, eavesdropping attack, birthday attack, malware attack, social engineering attack, session hijacking attack, criminology of computer crime, cyber forensics, cyber foot prints.

Unit 4

Safety Tools and Issues: Firewalls, logging and intrusion detection systems, e-mail security, digital signature, electronic signature, digital certificate, security issues in operating systems, ethics of hacking and cracking.

Unit 5

Cyber laws to be covered as per IT Act:

- [Section 43] Penalty and compensation for damage to computer etc.
- [Section 65] Tampering with computer source documents
- [Section 66A] Punishment for sending offensive messages through communication service etc.
- [Section 66B] Punishment for dishonestly receiving stolen computer resource or communication device
- [Section 66C] Punishment for identity theft
- [Section 66D] Punishment for cheating by personation by using computer resource
- [Section 66E] Punishment for violation of privacy
- [Section 66F] Punishment for cyber terrorism
- [Section 67] Punishment for publishing or transmitting obscene material in electronic form

- [Section 67A] Punishment for publishing or transmitting of material containing sexually explicit act, etc. in electronic form
- [Section 67B] Punishment for publishing or transmitting of material depicting children in sexually explicit act, etc. in electronic form
- [Section 72] Breach of confidentiality and privacy

Unit 6

Information Security in India: Brief introduction of IT infrastructure for information security in India.

Practical

Practical List for Information Security:

1. Demonstrate the use of Network tools: ping, ipconfig, ifconfig, tracert, arp, netstat, whois

   Suggested Readings: whois, ping, tracert, netstat, ifconfig:[2] (pg 33-34, 38-41, 80)

2. Use of Password cracking tools : John the Ripper, Ophcrack. Verify the strength of passwords using these tools.[2] Ch-6 (john the ripper)

3. Perform encryption and decryption of Caesar cipher. Write a script for performing these operations.

4. Demonstrate sending of a protected word document.

5. Demonstrate sending of a digitally signed document.

6. Demonstrate sending of a protected worksheet.

7. Demonstrate creating users - Admin and Regular

8. Use "steghide" steganography tool to hide data in an image file

9. Use nmap/zenmap to analyse a remote machine.(optional) [2] Ch-3 (nmap)

10. Use Burp proxy to capture and modify the message. (optional)

11. Demonstrate use of steganography tools.(optional)

12. Demonstrate use of gpg utility for signing and encrypting purposes.(optional)

References

1. Merkow, M. S., & Breithaupt, J. (2014). *Information Security Principles and Practices* (5th Edition). Pearson Education.
2. Snyder, G.R.F., & Pardoe, T. (2010). *Network Security*. Cengage Learning.
3. Whitman, M., & Mattod, H. J. (2015). *Principles of Information Security* (5th Edition). Cengage Learning.

Additional Resources

1. Basta, A., & Halton, W. (2008). *Computer Security: Concepts, Issues and Implementation*. Cengage Learning India.
2. Ross, A. (2001). *Security engineering*. John Wiley & Sons.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1.	Introduction: Protection, security, risk, threat, flaw, vulnerability, exploit, attack, confidentiality, integrity, availability.
2.	Introduction (contd.):Non-repudiation, authentication, authorization, ciphers, codes.
3.	Introduction (contd.): Substitution cipher (Caeser), transposition cipher (Rail-Fence).
4.	Introduction (contd.): Public key cryptography (definitions only), private key cryptography (definition and example), cyber forensics.
5.	Risk Analysis and Threat: Risk analysis, process, key principles of conventional computer security, authentication, data protection.
6.	Risk Analysis and Threat (contd.): Access control, internal vs external threat, security assurance, passwords.
7.	Risk Analysis and Threat (contd.): Security policies, computer forensics and incident response.
8.	Cyber Attacks and Digital Crime: DoS attack, man-in-the-middle attack, phishing attack, spoofing attack, spam attack, drive-by attack, password attack, SQL injection attack, cross-site scripting attack, eavesdropping attack.
9.	Cyber Attacks and Digital Crime (contd.): Birthday attack, malware attack, social engineering attack, session hijacking attack, criminology of computer crime, cyber forensics, cyber foot prints.
10.	Safety Tools and Issues : Firewalls, logging and intrusion detection systems, e-mail security
11.	Safety Tools and Issues (contd.): Security issues in operating systems.
12.	Safety Tools and Issues (contd.): Ethics of hacking and cracking. Cyber laws to be covered as per IT Act: Definitions: Digital certificate, Digital Signature And Electronic Signature, [Section 43].

13.	Cyber laws to be covered as per IT Act: [Section 65], [Section 66A], [Section 66B], [Section 66C], [Section 66D].
14. -15.	Cyber laws to be covered as per IT Act (contd.): [Section 66E], [Section 66F], [Section 67], [Section 67A], [Section 67B], [Section 72]. Information Security in India: Brief introduction of IT infrastructure for information security in India.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Hardware and software vulnerability, Cyber forensics, Risk Analysis, Cyber Laws, IT Act

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Project Work / Dissertation
(BACS06B)
Discipline Specific Elective - (DSE) Credit:6

Course Objective

The students will undergo one semester of project work based on the concepts studied in a subject of their choice. The objective is to train the students for the industry by exposing them to prototype development of real life software.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. develop a project plan based on informal description of the project.
2. implement the project as a team.
3. write a report on the project work carried out by the team and defend the work done by the team collectively.
4. present the work done by the team to the evaluation committee.

Unit 1

The students will work on any project based on the concepts studied in core/elective/ skill based elective courses. Specifically, the project could be a research study, or a software development project.

Unit 2

Project Group Organization/Plan

- Students will initially prepare a synopsis (500 words) and submit it to their respective department.
- For a given project, the group size could be a maximum of four (04) students.
- Each group will be assigned a teacher as a supervisor who will be responsible for their lab classes.
- A maximum of four (04) projects would be assigned to one teacher.

Unit 3

Project Evaluation

- 100 marks for end semester examination comprising Viva/presentation (50 marks) and project report evaluation (50 marks): to be awarded jointly by the external examiner and supervisor / mentor.
- 50 marks for continuous evaluation (to be awarded by the supervisor/mentor). Work carried out in each lab session will be assessed out of five marks (zero for being absent). Finally, the marks obtained will be scaled out of a maximum of 50 marks. For example, if 30 lab sessions are held in a semester, and a student has obtained an aggregate of 110 marks, then he/she will be assigned round (110/(30*5)) i.e. 37 marks.
- The students will submit only the soft copies of the report.
- The reports may be retained by the internal/external examiners.

Practical

Practical/discussion sessions based on the area of the project.

Teaching Learning Process

- Group Discussions
- Presentations by group of students for enhanced learning.

Assessment Methods

- Assignments, presentations, viva, quiz
- Internal assessment
- End semester exam

Keywords

Software Development, Project planning, Programming.

**Word Processing and Presentation Software
(BACS07A)
Skill-Enhancement Elective Course - (SEC-1A) Credit:4**

Course Objective

The course introduces the students to word processing and presentation software. The basic features and skills of creating, editing, inserting table, graphics and power point presentation are covered.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. create and refine documents using text formatting, tables and graphics.
2. use mail merge.
3. create macros and templates in documents.
4. protect documents.
5. create presentations containing transitions and animations. learn advanced presentation features like custom slide show, call outs and action buttons.

Unit 1

Word Processing Basics: Creating, opening and saving a document, text formatting, header and footer, creating and editing of tables, importing graphics, insert picture, using word processor's drawing features, text in drawing.

Unit 2

Advanced Features: Creating macros, watermarks, templates, reviewing documents, comparing and combining documents, protection of documents-using passwords.

Unit 3

Mail Merge: Mail merge concept, main document, data sources, merging data source and main document.

Unit 4

Presentation Tools : Creating presentations, using blank presentation option, using design template option, adding slides, deleting a slide, importing images from the outside world, deleting a slide, numbering a slide, saving presentation transition and animations, adding notes to slides, customize slideshow.

Practical
Practicals based on Word Processing and Presentation Software:

1. Design E-book cover page/ Magazine front/ books front/back page using cover page option in Insert Menu.

2. Create Business Cards using Shapes, text, and colors.

3. Design Happy Birthday Message by using Word Art.

4. Create a document
- Use Word Header & Footer to insert a header, including your last name and the page number, positioned at the top right side of the page.
- Your name should be separated from the number using a vertical line, similar to "Smith | 1".

- The title page should not have a page number.
- Use Roman numerals (i, ii, iii, etc.) for the page numbers for the Table of Contents, List of Figures and List of Tables pages.
- Arabic numbers (1, 2, 3 etc.) begin on the first page of the assignment and should be used for all subsequent pages (including appendices when applicable).

5. Create a bio-data for yourself.

6. Create a class time table using table option.

7. Create a student marks analysis table and apply formula to Total and Average.

8. Use MS Word to create a document with the given font type and size, Italic, bold, shading, borders and perform spell check to correct spelling mistakes, if any:

9. Create an invoice as shown below by using Table option and input data accordingly and use Sum function in a table for Total Amount:-

M/s Alpha Ltd				
22, Chhatra Marg, Delhi University Campus, Delhi-110007				
M/s Red and Blue Associates 87653, Rohit chambers, Nariman Point Bombay		Your Order: *Reference:* Dated: Invoice No:		
Invoice				
S.No	Item	Qty	Price	Amount
1				
2				
3				
			Total	

10. Reproduce the following text using WRITER:

Special Feature of PNB Card

- International Acceptance-Accepted over 30 million banks worldwide
  - 24 Hour ATM Access-Access cash over 95000 worldwide ATM

Schedule of Charges

Description of charges	PNB Cards	Diners Club International cards
1. Transaction Fees	2.5% on advanced amount	3% on advanced amount
2. Late Payment Fees	- Rs 300 for Bill <20000 - Rs 400 for Bill >20000	- 2.95%- Payment due by 30 days - 5%-Payment due by 60 days
3. Over Credit Charge	- 2.5 % over the limit	- Not Applicable

11. Write a college invitation letter and merge the draft with student's personal database using mail merge.
12. XYZ college issues a certificate to all the students who get training from the college. It offers 3 courses Mobile repairing, PC repairing and Camera repairing. It has 5 students of whom the record is kept in the database in the following sequence: Name, Date of Birth, Gender, Fee Paid and Division in which He/She passed. Create a database and issue the certificate as follows using mail merge.

To Whom So It May Concern

Date: July 29, 2017

This is to certify that Mr/Ms <<Name>> whose date of birth according to
College record is <<Date of Birth>> has passed <<course>> in <<divison>>
He/She has paid a total fee of Rs. <<Fee>>

XYZ
Course Coordinator

Note: Use "Mr" for male students and "Miss" for female students.

Practical list for Presentation

1. Create five Presentation slides. Each slide should support different format. In these slides explain areas of applications of IT. Make slide transition time as 10 seconds.
2. Create five Presentation slides to give advantages/disadvantages of computer, application of computers and logical structure of computer.
3. Create five Presentation slides detailing the process of internal assessment. It should be a self-running demo.
4. Create five presentation slides, one having table, one having clip-art and others giving in brief the details of the two above slides. Create a self-running demo of the slides.
5. Create a presentation to teach that area of a square is a*a where 'a' is the size of side of the square. Explain this feature with suitable diagram. Also explain that when a given square is divided into two equal parts, how do you calculate its area (area of part), with a suitable example.
6. Create a presentation to explain the key feature of BA program with proper coloring and formatting of the slides (at least 8 slides). Your slides should contain figures, graphs. During slide show, slides should run automatically after specified time (a suitable time).

References

1. Libreoffice Documentation Team (2018) *Getting Started with LibreOffice 6.0*. Friends of OpenDocument, Inc.
2. Libreoffice Documentation Team (2018), *LibreOffice 6.0 Writer Guide*. Friends of OpenDocument, Inc.
3. Mali, L. (2017). *Libre office 5.1 Impress, Draw*. Base book- Vol 2, Notion Press.

Additional Resources

Free internet resources as decided by the department in the beginning of semester.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions
- Unit-wise assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1	Word Processing Basics: Basic word processing concepts, creating, opening and saving of a document. Editing text data in word processor
2	Word Processing Basics (contd.): Text Formatting, Headers and footer, creating and editing of tables.
3	Word Processing Basics (contd.): Importing graphics, inserting pictures.
4	Word Processing Basics (contd.): Using word processing software's drawing features, text in drawing.
5	Advanced Features: Creating macros, Watermarks, templates.
6	Advanced Features (contd.): Reviewing documents, comparing and combining documents.
7	Advanced Features (contd.): Protection of documents in word processing software using passwords.
8	Mail Merge: Mail merge concept, main document, data sources, merging data source and main document.
9	Presentation Tools: Creating basic presentations: Using blank presentation option, adding slides, deleting a slide.
10	Presentation Tools (contd.): Using design template option, using different designs in a presentation.
11	Presentation Tools (contd.): Importing images, audio and video from the outside world and integrating into presentation.
12	Presentation Tools (contd.): Numbering a slide, saving presentation, adding notes.
13	Presentation Tools (contd.): Transition and animations, customize slideshow.
14-15	Creating presentation on relevant topics and presenting in class.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Word processing, Mail-merge, Macros, Presentation.

PHP Programming
(BACS07B)
Skill-Enhancement Elective Course - (SEC-1B) Credit:4

Course Objective

This course is designed as a first course in PHP programming. The course focuses on the principle of server side scripting and building dynamic web applications.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. write PHP scripts to handle HTML forms.
2. write regular expressions including modifiers, operators, and meta-characters.
3. write PHP programs that use various PHP library functions, and that manipulate files and directories.
4. create a dynamic web site employing server side scripting.

Unit 1

Introduction: Introduction to PHP, installation, testing an installation, setting time zone, running PHP with other web servers, embedding PHP within HTML , using comments.

PHP Language Basics:Variables, data types, type casting, operators and expressions, Operator Types, operator precedence, constants

Unit 2

Decisions and Loops : If statement, switch statement, ternary operator, looping, while Statement, do-while loop, for statement, break statement, continue statement, nested loops.

Unit 3

Strings: Introduction to strings in PHP, string functions strlen(), str_word_count(), strrev(), strpos(), str_replace(), echo(), bin2hex(), hex2bin(), ltrim(), rtrim()

Unit 4

Arrays : Arrays, indexed arrays - associative, multidimensional arrays, count(), loop through an indexed array, loop through an associative array using foreach loop, two dimensional array, looping in two dimensional array, sort() function, rsort(), asort(), ksort(), arsort(), krsort().

Practical
Practical for PHP Programming

1. Create a script to construct the following pattern
   *
   **
   ***
   ****
   *****

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

2. Write PHP Script for addition of two 2x2 matrices.
3. Write PHP Script to generate result and display grade
4. Write a program to calculate and print the factorial of a number.
5. Write a program to count a specific characters in a string.
6. Write a PHP script to get the shortest/longest string length from an array.
7. Write a PHP function that returns the lowest integer that is not 0
8. Create a PHP page using functions for comparing three integers and print the largest number.
9. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
10. WAP to check whether the given number is prime or not.
11. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
12. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)
13. Write a PHP script that finds out the sum of first n odd numbers.
14. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.
15. Write a PHP script that checks if a string contains another string.
16. Write a simple PHP program to check that emails are valid.
17. WAP to print first n even numbers.
18. Using switch case and dropdown list display a "Hello" message depending on the language selected in drop down list.
19. Write a PHP program to print Fibonacci series using recursion.
20. Write a PHP script to replace the first 'the' of the following string with 'That'. Sample: 'the quick brown fox jumps over the lazy dog.' Expected Result: That quick brown fox jumps over the lazy dog.

References

1. Forbes, A. (2015). *The Joy of PHP Programming: A Beginner's Guide*. Createspace Independent Pub.
2. Holzne, S. (2017). *PHP: The Complete Reference*. McGraw Hill Education.

Additional Resources

1. Nixon, R. (2015). *Learning PHP, MySQL & JavaScript with j Query, CSS and HTML5* (Paperback). O'rielly.
2. Welling, L., & Thompson, L. (2016). *PHP and MySQL Web Development*. Pearson Education.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions

- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1	Introduction Introduction and evolution of PHP, installation, testing an installation, setting time zone.
2	Introduction (cont..) Running PHP with other web servers, embedding PHP within HTML, using comments.
3	Introduction (cont..) Variables, data types, changing type by casting, operators and expressions: operator types, operator precedence, constants.
4	Decisions and loops If statement, else statement, switch statement.
5	Decisions and Loops (cont..) Ternary operator, while loop, do . . . while Loop.
6	Decisions and Loops (cont..) For loop, break statement, continue statement, nested loops.
7	Strings Introduction to strings in PHP, string functions: calculating string length using strlen(), counting the number of words in a string using str_word_count(), reversing a string using strrev().
8	Strings (cont..) Search for a specific text using strpos(), replace the text using str_replace(), output one or more string using echo().
9	Strings (cont..) Converts a string of ASCII characters to hexadecimal values using bin2hex(), converts a string of hexadecimal values to ASCII characters using hex2bin().
10	Strings (cont..) Removes whitespace or other characters from the left side of a string using ltrim(), removes whitespace or other characters from the right side of a string using rtrim().
11	Arrays Create an Array in PHP, types of arrays: Indexed arrays - arrays with a numeric index, associative arrays - arrays with named keys.
12	Arrays (cont..) Multidimensional arrays - arrays containing one or more arrays, get the length of an array using count(), loop through an indexed array using for loop, loop through an associative array using foreach loop.

13	Arrays (cont..) Two dimensional array - looping in two dimensional array, sort array in ascending order using sort() function, sort array in descending order using rsort(),sort associative arrays in ascending order, according to the value using asort().
14-15	Arrays (cont..) Sort associative arrays in ascending order, according to the key using ksort(), sort associative arrays in descending order, according to the value using arsort(), sort associative arrays in descending order, according to the key krsort().

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

PHP, Web Server, Strings, Arrays

Data Handling using Spreadsheet
(BACS08A)
Skill-Enhancement Elective Course - (SEC-2A) Credit:4

Course Objective

The course will help students to learn how to analyse data with spreadsheets. They will learn about referencing, charts, functions and various utilities.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. perform data analysis and manipulation in a spreadsheet.
2. use built-in mathematical functions in a spreadsheet.
3. perform what-if analysis using Goal seek, ASAP utility add-ins in spreadsheets.
4. sort and filter data.
5. protect a spreadsheet

Unit 1

Functions: Relative, absolute and mixed referencing, mathematical and statistical functions, nested functions, VLOOKUP, HLOOKUP and pivot table

Unit 2

Charts: Data visualization using built in charts.

Unit 3

Utilities: What-if scenarios, goal seek, solver, data validation, creating a drop down list from a range of cells, data filtering and sorting, calculating linking sheets, detective tools, using regular expression in functions, add-in in calc.

Unit 4

Protection: using passwords and digital signatures on spreadsheets

Practical

Practical list for Data Handling using Spreadsheet

1. In a meeting of a marketing department of an organization it has been decided that price of selling an item is fixed at Rs. 40. It was resolved to increases the selling of more items and getting the profit of Rs. 50000/-. Use Goal Seek of find out how many items you will have to sell to meet your profit figure.
2. For the current business situation, the profit earned is Rs.460000. If you wish to know what percentage of units produced should be sold in open market in order to make a profit of Rs.

Cycle Store	
Total No. of Cycles Manufactured	% of cycles sold in open market
2000	40%

	No. of Cycles Sold	Sales Price per unit	Cost Price per unit	Profit per unit
Sold in open market		1200	800	
Sold to stockists		1000	800	
	Fixed Cost	100000		
	Total Profit			

50000, use Goal Seek. (enter the data in the tables accordingly)

3. Consider the following worksheet:- (enter 5 records)

FULL NAME	GRADE 1/2/3	BASIC SALARY	HRA	PF	GROSS	NET	VA	VA>HRA

HRA is calculated as follows:

Grade	HRA (% of basic)
1	40%
2	35%
3	30%

PF is 8% for all grades

VA is 15000, 10000, 7000 for Grades 1, 2 and3.

Gross=Basic+HRA+VA

Net=Gross-PF

i) Find max, min and average salary of employees in respective Grade.
ii) Count no. of people where VA>HRA
iii) Find out most frequently occurring grade.
iv) Extract records where employee name starts with "A" has HRA>10000
v) Print Grade wise report of all employees with subtotals of net salary and also grand totals.
vi) Use subtotal command.
vii) Extract records where Grade is 1 or 2 and salary is between 10000 and 20000 both inclusive.

4. You are required to prepare a payroll statement in the given format making maximum use of cell referencing facility:

Code	Name	Category	Is HRA is to be Paid	Basic	DP	DA	HRA	TA	CCA	Gross
1			Y							
2			N							
	Total									

Required:
- Basic salary (Allow any Basic salary in the range of Rs.10000-35000)
- DP is 50% of Basic Salary.
- DA (as a Percentage of Basic + DP) is more than 35000 then 40% of basic else 30% of basic.
- HRA is to be paid @ 40% of (Basic plus DP) to those whom HRA payable is yes.
- TA is to be paid @ Rs. 800 PM if Basic Salary is Less than Rs.12000, otherwise the TA is Rs. 1000 PM)
- CCA is to be paid @ Rs. 300 PM if Basic Salary is less than Rs.12000/- otherwise the CCA is Rs. 500 PM)
- Gross salary is the sum of Salary and all other allowances
- Deduction: a) GPF 10% of (Basic +DP)) subject to a minimum of Rs.2000/- b) IT 10% of Gross Salary
- Net salary is Gross salary minus total deductions.

5. Consider the following worksheet for APS 1st year students:-

S.No.	Name	Physics	Chem	Bio	Maths	CS	Total	%	Grade
1									
2									
3									
4									
5									

Grade is calculated as follows:
If % >=90   Grade A
If % >=80 & <90   Grade B
If % >=70 & <80   Grade C
If % >=60 & <70   Grade D
Otherwise students will be declared fail.
i) Calculate Grade using if function
ii) Sort the data according to total marks
iii) Apply filter to display the marks of the students having more than 65% marks.

iv) Draw a pie chart showing % marks scored in each subject by the topper of the class.

v) Draw the doughnut chart of the data as in (iv)

vi) Enter the S.No. of a student and find out the Grade of the student using VLOOKUP.

vii) Extract all records where name
    a) Begins with "A"
    b) Contains "A"
    c) Ends with "A"

6. Using a simple pendulum, plot I vs T and I vs T^2 graph (enter 5 values of I, t_1, t_2 and t_3).

I	t_1	t_2	t_3	Mean(t_i)	T=t/20	T^2

7. Create the following worksheet(s) containing an year wise sale figure of five salesmen (in Rs.) in the format given below

Salesman	2002	2003	2004	2005

Apply the following Mathematical & Statistical functions:

    i) Calculate the commission for each salesman under the condition:

    a) If total sale is greater than Rs. 3,00,000/-, then commission is 10% of total sale made by the salesman.

    b) Otherwise, 4% of total sale.

    ii) Calculate the maximum sale made by each salesman.

    iii) Calculate the maximum sale made in each year.

    iv) Calculate the minimum sale made by each salesman.

    v) Calculate the minimum sale made in each year.

    vi) Count the no. of sales persons.

    vii) Calculate the cube of sales made by different salesmen in the year 2002.

    viii) Find the difference in sales by different salesmen between the year 2002 and 2003. Find the absolute value of difference.

    ix) Also calculate the Standard deviation and Variance for the sale made by each salesman.

    ix) Calculate the year wise Correlation coefficient between two salesman year wise.

8. Enter the sales in Rs. for the year 2000, 2001, 2002, 2003 of five different salesmen in an Excel Sheet according to the format given below:

Salesman	2000	2001	2002	2003

    i) Calculate total sale year wise.

    ii) Calculate the net sales made by each salesman

    iii) Calculate the commission for each salesman under the condition:

        a) If total sales is greater than Rs. 4, 00,000/-, then commission is 5% of total sale made by the salesman.

        b) Otherwise, 2% of total sale.

    iv) Calculate the maximum sale made by each salesman.

    v) Calculate the maximum sale made in each year.

    vi) Draw a bar graph representing the sale made by each salesman.

    vii) Draw a pie graph representing the sale made by salesmen in year 2001.

9. Enter the data for five different students in a worksheet and then calculate their grade

S.No.	Roll No.	Name	Marks	Grade

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
>= 80	A+
>= 60 < 80	A
>= 50 < 60	B
	F
< 50	

10.   Enter the data for yearwise revenue earned by xyz's bookstall in a worksheet

TOTAL REVENUE EARNED FOR XYZ'S BOOKSTALL					
Publisher Name	1997	1998	1999	2000	Total

   a.   Compute the total revenue earned.
   b.   Plot the line chart to compare the revenue of all publisher for 4 years.
   c.   Chart Title should be 'Total Revenue of XYZ's Bookstall (1997-2000)'
   d.   Give appropriate categories and value to axis titles.

   11.   Create a workbook containing data shown in question 10 and protect the worksheet by inserting password so that users cannot insert, delete, rename, move, copy, hide or unhide worksheet anymore.
   12.   Add digital signature in a worksheet.
   13.   Create a Drop down list from a range of cells by using Data validation.
   14.   By using Quick Operations (Multiply) increase all the revenue values by 10 percent.
   15.   Consolidating and Linking Spreadsheets:
Enter the following information onto Sheet1. Double click on the tab for the worksheet and rename it: East. (It represents sales in Rs. 1000)

	A	B	C	D	E	F
1	1997 Record Sales: East Store					
2		First	Second	Third	Fourth	Annual
3		Quarter	Quarter	Quarter	Quarter	Total
4	Pop	254	290	198	354	
5	Soul	154	184	154	290	
6	R&B	290	320	287	456	
7	Country	345	361	258	524	
8	Classical	45	52	12	98	
9	Soundtracks	75	125	157	185	
10	Children	26	19	15	56	
11	TOTAL					

   Enter the following information onto Sheet2. Double click on the tab for the worksheet and rename it West.

	A	B	C	D	E	F
1	1997 Record Sales: West Store					
2		First	Second	Third	Fourth	Annual
3		Quarter	Quarter	Quarter	Quarter	Total
4	Pop	154	167	142	245	
5	Soul	165	124	225	264	
6	R&B	187	95	254	322	
7	Country	201	210	342	412	
8	Classical	12	21	18	54	

	A	B	C	D	E	F
9	Soundtracks	42	34	65	102	
10	Children	20	16	20	45	
11	TOTAL					

Enter the following row and column labels onto Sheets 3 and 4. Rename Sheet3: Consolidate. Rename Sheet4: Link.

	A	B	C	D	E	F
1	1997 Record Sales: Combined Sales					
2		First	Second	Third	Fourth	Annual
3		Quarter	Quarter	Quarter	Quarter	Total
4	Pop					
5	Soul					
6	R&B					
7	Country					
8	Classical					
9	Soundtracks					
10	Children					
11	TOTAL					

(Highlight the cell ranges B4:F11. Open the FORMAT menu, select CELLS..., select CURRENCY, and select $1,234. Click on OK. Do this for both the East and West worksheets.
Enter the following formulas in the appropriate cells on both the East and West worksheets.
B11:   =sum(b4:b10)
Copy the formula in cell B11 to cells C11 through F11.
F4:   =sum(b4:e4)
Copy the formula in cell F4 to cells F5 through F10.)
Hint : (Add another worksheet to your spreadsheet as this exercise has you using four worksheets. Open the INSERT menu, select WORKSHEET. A new worksheet label Sheet4 should be added to your spreadsheet.
Click on the tab Consolidate to make it the active worksheet. Open the DATA menu, select the option CONSOLIDATE.
Under the "Reference:" option enter the following: East!b4:f11
Then click on ADD. This refers to cells B4:F11 on worksheet East.
Under the "Reference:" option enter the following: West!b4:f11
Then click on ADD. The cell range B4:F11 for both East and West worksheets should be entered in the "All References" box.
Click OK.
The worksheet Consolidate should now report the sum of the East and West store sales for each category of music by quarter.)
Your worksheet Consolidate should look like the one below.

	A	B	C	D	E	F
1	1997 Record Sales: Combined Sales					
2		First	Second	Third	Fourth	Annual
3		Quarter	Quarter	Quarter	Quarter	Total
4	Pop	$408	$457	$340	$599	$1,804
5	Soul	$319	$308	$379	$554	$1,560
6	R&B	$477	$415	$541	$778	$2,211
7	Country	$546	$571	$600	$936	$2,653
8	Classical	$57	$73	$30	$152	$312
9	Soundtracks	$117	$159	$222	$287	$785
10	Children	$46	$35	$35	$101	$217
11	TOTAL	$1,970	$2,018	$2,147	$3,407	$9,542

Your Link worksheet should look like the one below.

	A	B	C	D	E	F
1	1997 Record Sales: Combined Sales					
2		First	Second	Third	Fourth	Annual
3		Quarter	Quarter	Quarter	Quarter	Total
6	Pop	$408	$457	$340	$599	$1,804
9	Soul	$319	$308	$379	$554	$1,560
12	R&B	$477	$415	$541	$778	$2,211
15	Country	$546	$571	$600	$936	$2,653
18	Classical	$57	$73	$30	$152	$312
21	Soundtracks	$117	$159	$222	$287	$785
24	Children	$46	$35	$35	$101	$217
27	TOTAL	$1,970	$2,018	$2,147	$3,407	$9,542

(The difference in this second merged worksheet is that after it is created, any changes in the East and West worksheets will be updated on the Link worksheet. Modify some of the figures on the East or West worksheet and see how the numbers on the Link worksheet are updated but the numbers on the Consolidate worksheet are still the same.)

References

1. Mali, L. (2017). *Libre Office 5.1 Writer, Calc*: Math Formula Book- Vol 1. Notion Press.

Additional Resources

Relevant user manuals and online resources decided each year by the committee of course

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Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1	Referencing: Relative, Absolute and Mixed references.
2	Functions (contd.): Mathematical functions.
3	Functions (contd.): Statistical functions nested functions.
4	Functions (contd.): VLOOKUP, HLOOKUP.
5	Functions (contd.): Pivot table and its functions.
6	Charts: Data visualization using built in charts.
7	Utilities: What-if Scenarios, Goal seek, Solver.
8	Utilities (contd.): Data validation.
9	Utilities (contd.): Creating a drop down list from a range of cells.
10	Utilities (contd.): Data filtering and sorting.

11	Utilities (contd.): Calculating linking sheets.
12	Utilities (contd.): Detective tools.
13-14	Utilities (contd.): Using regular expression in functions, add-in calc.
15	Protection: using passwords and digital signatures on spreadsheets.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Referencing, Charts, Functions, Protection

Web Designing using HTML 5
(BACS08B)
Skill-Enhancement Elective Course - (SEC-2B) Credit:4

Course Objective

The course introduces the students to planning and designing effective web pages, implementing web pages by writing HTML and CSS code and producing a functional website.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. define the principle and basics of Web page design
2. visualize the basic concept of HTML.
3. recognize the elements of HTML.
4. apply basic concept of CSS.
5. publish the web pages.

Unit 1

Introduction to HTML: What is HTML, HTML Documents, basic structure of an HTML document, creating an HTML document, markup tags, heading-paragraphs, line breaks, HTML tags.

Unit 2

Elements of HTML: Introduction to elements of HTML, working with Text, working with Lists, tables and frames, working with hyperlinks, images and multimedia, working with forms and controls.

Unit 3

Introduction to Cascading Style Sheets: Concept of CSS, creating style sheet, CSS properties, CSS styling (background, text format, controlling fonts), working with block elements and objects, working with lists and tables, CSS id and class, box model (introduction, border properties, padding properties, margin properties).

Unit 4

CSS Advanced Features: CSS advanced features (grouping, dimension, display, positioning, floating, align, pseudo class, navigation bar, image sprites, attribute sector), CSS color.

Unit 5

JavaScript Fundamentals: Data types and variables, functions, methods and events, controlling program flow, JavaScript object model, built-in objects and operators.
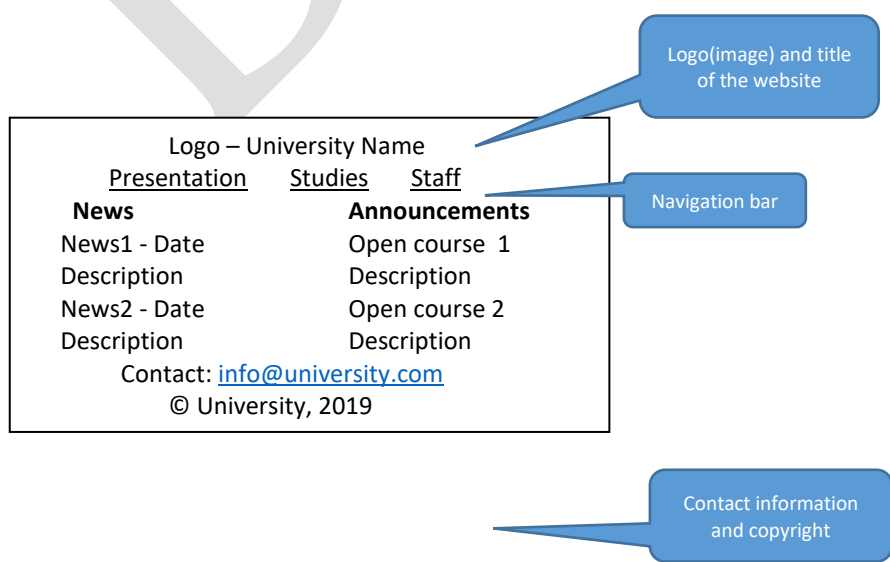
Unit 6

Introduction to Web Publishing or Hosting: Creating website, saving the website, working on the website, creating website structure, creating titles for web pages, themes-publishing websites

Practical
Practicals on Web Designing using HTML5:

1. Create your own CSS files with custom styles.
2. Demonstrate the use of these styles in various web pages
3. Demonstrate the use of audio in HTML5.
4. Demonstrate the use of video in HTML5.
5. Demonstrate the HTML5 form with text flow management.
6. Create a program so that the initial text shown on the screen is "Monday", and it will change in the following way when the button is pressed repeatedly: Monday ... Tuesday ... Wednesday ... Thursday ... Friday ... Saturday ... Sunday ... Monday ... Tuesday ... etc.
7. Add a new image to the list of pictures that is being displayed by the page.
8. Create a website with the following information, structure, and visual presentation

Logo(image) and title of the website

Logo – University Name
Presentation   Studies   Staff

News   **Announcements**
News1 - Date   Open course 1
Description   Description
News2 - Date   Open course 2
Description   Description
Contact: info@university.com
© University, 2019

Navigation bar

Contact information and copyright

References

1. Boehm, A., & Ruvalcaba, Z. (2018). *Munarch's HTML5 and CCS*(4th Edition). Mike Murach & Associates.

Additional Resources

1. Minnick, J. (2015). *Web Design with HTML5 and CSS3* (8th Edition). Cengage Learning.
2. Relevant user manuals and online resources decided each year by the committee of courses.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1	Introduction to HTML: What is HTML, HTML documents, basic structure of an HTML document. Creating an HTML document, mark up tags, heading-paragraphs, line breaks, and HTML tags.
2	Elements of HTML5: Introduction to elements of HTML5, working with text, working with lists, tables.
3	Elements of HTML5 (contd.): Creating frames, working with hyperlinks, images and multimedia.
4	Elements of HTML5 (contd.): Working with forms and controls.
5	Introduction to Cascading Style Sheets: concept of CSS, creating style sheet, CSS properties.
6	Introduction to Cascading Style Sheets (contd.): CSS Styling (background, text Format, controlling fonts), working with block elements and objects.
7	Introduction to Cascading Style Sheets (contd.): Working with lists and tables, CSS id and class, box model (introduction, border properties, padding properties, margin properties),
8	CSS Advanced: Grouping, dimension, display, positioning, floating, align, pseudo class, navigation bar, image sprites, attribute sector.
9	CSS Advanced (contd.): CSS Color, creating page layout and site designs.
10 -11	Introduction To Web Publishing Or Hosting: Creating the web Site, saving the web site, working on the web site. Creating web site structure, creating titles for web pages, themes-publishing web sites.
12-15	JavaScript Fundamentals: Data types and variables. Functions, methods and events, controlling program flow, JavaScript object model, built-in objects and operators.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Web Design, HTML, CSS, Web Publishing

Open Source Softwares
(BACS09A)
Skill-Enhancement Elective Course - (SEC-3A) Credit:4

Course Objective

The course defines what open source software is and will cover the history of open source software and its benefits. Students will learn about the linux operating system. They will also learn copyright law and different licensing models.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. install open source software.
2. work on an open source operating system like Linux, Gambas and Gimp.
3. describe common open source licenses and the impact of choosing a license.
4. find open source projects related to a given development problem.
5. identify open source alternatives available for a given proprietary software.
6. participate in a public open source project/ task.

Unit 1

Introduction: History of Open Source Software (OSS), commercial software vs OSS, free software vs freeware, open source software examples - the GNU projects, copy right issues about open source software.

Unit 2

The Linux operating system : Linux installation and hardware configuration – boot process - Linux loader (LILO) – Grand Unified Boot loader (GRUB), user account, accessing, starting and shutting processes, log in and log out, command line, simple commands, Unix file system, Unix files, i-node structure and file system related commands.

Unit 3

Basic principles of copyright law, open source licensing, issues with copyright and patent, warranty, MIT license, BSD License, Apache license, Academic Free License, Mozilla Public License, GPL, LGPL.

Unit 4

Study of commercial application software vs OSS, Open Office.

Unit 5

GAMBAS: GUI environment: GAMBUS IDE, compiling, debugging and running the programs, explain new project window, property window, project explorer window.

GAMBAS: Working with controls like textbox, frames, check box, option button, images, designing the user interface, coding for controls; data types, constants, declaring variables, scope of variables, formatting data.

GAMBAS: Conditional and loop statements: If and nested if statements, comparing strings, select case statement, using statement, displaying message in message box, user input validation.

Unit 6

GIMP: Installation, GIMP user interface, creating new windows.

GIMP: Freehand drawing in GIMP, drawing regular shapes, image editing- cropping and resizing, masking.

GIMP: Language support

Practical

Practicals based on Open Source Software:

GAMBAS PRACTICAL QUESTIONS

1. Write a program to finding the average of numbers.
2. Write a program that will allow the user to enter a name and three test scores subject wise.
3. Write a program to print hello word in text box.
4. Write a program to link two different forms.
5. Write a program to enter two numbers into two different boxes. The result should be displayed into the third box.
6. Write a program to design a simple calculator that performs the basic operation.
7. Write a program to ask the user to guess the number, it will keep asking them to guess the number until they guess it correctly. Once they have guessed it correctly it will tell them how many attempts it took.
8. Write a program that will allow the user to enter their name, select the day of the week that their birthday falls on a particular year and then choose the month of their birthday from the list.

GIMP PRACTICAL QUESTIONS

1. Design a collage from the pictures of any recent event held in school.
2. Design a digital poster for any state of your choice in India depicting their tourist spots and thus promoting tourism.
3. Collect and import few pictures or images of important monuments (tourist spots). Add layers and place a picture in each layer. Merge layers and edit layers and use mask to selectively colour the images.
4. Design a three dimensional poster in GIMP.
5. Take a screen shot of the window using the technique Screenshot in GIMP.

Hints:
- Set the background.
- Include the text "University of Delhi, Delhi" in two lines with suitable colour.
- Export the picture into ping format and save it in the folder

6. Prepare a poster in GIMP as:-
   - Open the picture of Traffic Light in Home through GIMP.
   - Take a duplicate and close the original picture.
   - Crop the part with the traffic signal.
   - Include the text ' OBEY TRAFFIC RULES ' in two lines.
   - Export the picture into png format and save it in the folder.

References

1. Laurent, A..M. (2004), *Understanding Open Source and Free Software Licensing*. O'Reilly Media.
2. Rao, M. N. (2014). *Fundamentals of Open Source Software* (1st edition). PHI Learning.
3. Shotts, W.E. (2012). *The Linux Command Line: A Complete Introduction*. No Starch Press.

Additional Resources
1. Das, S. (2000). *Your Unix - The Ultimate Guide.* TMH.
2. Lecarme, O. and Delvare, K. (2013). *The Book of GIMP*. No Starch Press.
3. Smith, J. and Joost, R. (2012) *GIMP for Absolute Beginners*. Apress.
4. https://en.wikibooks.org/wiki/Gambas.
5. Relevant user manuals and online resources decided each year by the committee of courses.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning

Tentative weekly teaching plan is as follows:

Week	Topics
1.	Introduction: History of Open Source Software (OSS), commercial software vs OSS, free software vs freeware, open source software examples - the GNU projects, copy right issues about open source software.
2.	The Linux Operating System: Linux installation and hardware configuration – boot process- The Linux loader (LILO) – The Grand Unified Boot loader (GRUB), user accounts, accessing, starting and shutting processes, log in and log out.
3.	The Linux Operating System (contd.): Command line, simple commands, Unix file system, Unix files, i-nodes and structure and file system related commands.
4.	Unit 3: Basic principles of copyright law, open Source licensing, issues with copyright and patents, warranties.
5.	MIT license, BSD License, Apache license.

6.	Academic Free License, Mozilla Public License.
7.	GPL, LGPL.
8.	Unit 4: Study of commercial application software vs OSS, Open Office.
9.	GAMBAS: GUI environment: GAMBUS IDE, compiling, debugging and running the programs, explain new project window, property window, project explorer window
10.	GAMBAS (contd.): Working with controls like textbox, frames, check box, option button, images, designing the user interface, coding for controls; data types, constants, declaring variables, scope of variables, formatting data.
11.	GAMBAS (contd.): Conditional and loop statements: If and nested if statements, comparing strings, select case statement, using statement, displaying message in message box, user input validation
12.	GIMP: Installation, GIMP user interface, creating new windows,
13.-14.	GIMP (contd.): Freehand drawing in GIMP, drawing regular shapes, image editing-cropping and resizing, masking
15.	GIMP (contd.): Language support

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Open Source Software, Free software, LINUX operating system, open source licensing, GPL, LGPL, GIMP, GAMBAS

Desktop Publishing
(BACS09B)
Skill-Enhancement Elective Course - (SEC-3B) Credit:4

Course Objective

This is an introductory course that provides students with a basic understanding of the field of desktop publishing including page layout and design.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. write, edit and print documents using word processing and spreadsheet.

2. use tools for Desktop Publishing and would be able to create and design documents with text and graphics like newspaper ads, visiting cards, posters etc.

Unit 1

Introduction: Introduction to desktop publishing, the need and tools.

Unit 2

Master Pages Preparation: Prepare borders dies, first page, left and right pages.

Unit 3

Layout: Skeleton, composition, fonts install, place objects, naming, fill text frame, styles, fit text properly in the frame, link text frames, lists, links.

Unit 4

Image: Transform, flow text around, path and nodes, effects, Glyth to vector graphics.

Unit 5

Cover Design: Design layout, decompose into geometric primitives, layers, levels, multilingual layout.

Unit 6

Publish: Export, store, print.

Practical
Practicals based on Desktop Publishing:

Question1)Your musical group is well practiced and ready to play some live gigs. Write a letter to club owners introducing yourselves. To create a good impression you want to print the letter on your own letterhead.

Your task:
- Create a letterhead for your musical group that contains its name. Below it place the mailing address and telephone number against the left margin and the email and web site address against the right margin.
- Use one or more horizontal lines for effect.
- Change the top page margin to 0.75"

Desktop Publishing Skills
Check these areas for the Skills you need.
- ❏ Margin
- ❏ TextArt
- ❏ Flush Right
- ❏ Horizontal Line

Question2) Create sign/flyer to get the word out about your dance groups upcoming performance. You need a stack of flyers that will stand out on a crowded bulletin board or store window. It has to grab the viewer's attention and clearly communicate the important details about the show.

Your task:
- Create an 81/2 X 11 Sign/Flyer that promotes either an upcoming performance by your dance group.
- As you plan the layout of your flyer keep in mind the rule of threes, points of interest and white space

Desktop Publishing Skills
Check these areas for the Skills you need.
- ❏ Page Orientation
- ❏ Margin
- ❏ TextArt
- ❏ Graphic Image
- ❏ TextArt
- ❏ Horizontal Line
- ❏ Text Box

Question3) Design a Newspaper Advertisement about new gym in the newspaper. The good news is you can design your own ad and submit it to the newspaper. The bad news is you don't have much money so you can only afford an ad about 1/6 the size of a regular sheet of paper. Clarity and simplicity will be essential.
Your task:
- Create an advertisement that promotes your gym.
- Adjusting the margins to the Minimum amount will increase the space available on your divided page section
- Inserting a table of one column and one row will allow you to use all of the features available to modify a cell
- Your ad will be in printed black and greys on a white background. Use this contrast to your advantage.

Desktop Publishing Skills
Check these areas for the Skills you need.
- ❏ Margin
- ❏ Divide Page
- ❏ Table
- ❏ Text Box
- ❏ Border/Fill

Question 4) Design invitations or thank you cards to the important folks invested or helped in your restaurant set up.

Your task:
- Using a regular sheet of paper, create a two fold invitation or thank you card.
- A two fold card is one made by folding the paper once in half, top to bottom and once again in half side to side.
- You need to design a cover panel and at least one inside panel for your card.

- Planning your design will be important since you will need at least one upside down panel in the original layout. Check out how to rotate a Text Box in the Skills section.
- Adjusting the margins to the Minimum amount will increase the space available on each divided page section (card panel)

Desktop Publishing Skills

Check these areas for the Skills you need.

- ❏ Divide Page
- ❏ Page Break
- ❏ TextArt
- ❏ Graphic
- ❏ Flip Graphic
- ❏ Text Box
- ❏ Border/Fill

Question 5 - You decided to open "computer academy". This Institute of higher learning offers lessons to people of all ages. A brochure would be a simple but effective way to give potential customers all the information they need.

Your task:

- Create a six panel tri-fold brochure promoting your computer business.
- Your layout should use two separate pages with three panels on each. Imagine that they will be photocopied back to back.
- Along with the name, location and contact information be sure to include information on what services are offered, prices and some enticing information to attract people.
- Planning your design will be important as you consider what information goes on which panel. Do you want a barrel/roll fold or a Z/accordion fold design? Folding a piece of paper in three helps to give you ideas of the possibilities and where to place items.
- Using a Landscape page orientation will provide the best design possibilities
- Adjusting the margins to the Minimum amount will increase the space available on each divided page section (card panel)
- Carefully using Text Boxes, Graphics, Horizontal Lines, Bullets and Drop Caps are all ways to add visual impact to a single column of text.
- Carefully varying font style and size but maintaining consistency throughout the brochure

Desktop Publishing Skills

Check these areas for the Skills you need.

- ❏ Page Orientation
- ❏ Divide Page (3 Columns across 2 pages for 6 Panels)
- ❏ TextArt
- ❏ Center Text (Vertically)
- ❏ Text Box
- ❏ Graphic
- ❏ Text Wrap
- ❏ Drop Cap

Question 6)You are a rising cricketer . You have fans! Not a huge number but some faithful devotees who want news about you that they can read and pass along to others. While you are not yet at full fanzine status you are at the one page newsletter level.

Your task:

- Create the first issue of a three column newsletter with a catchy title at the top and lots of interesting information about you or your tours.

- The Name Plate must include the title, sub-title telling what the newsletter is about, the date and issue number
- The body of the newsletter can include things like the latest news, likes and dislikes, photos and contests.
- Using the Columns feature rather than Dividing the Page will allow you to create a Name Plate at the top of your page.
- Carefully using Text Boxes, Graphics, Horizontal Lines, Bullets and Drop Caps are all ways to add visual impact to a single column of text.
- Carefully varying font style and size but maintaining consistency throughout the newsletter

Desktop Publishing Skills
Check these areas for the Skills you need.
- ❏ TextArt
- ❏ Flush Right
- ❏ Horizontal Line
- ❏ Columns
- ❏ Text Box
- ❏ Graphic
- ❏ Text Wrap

Question 7)Big shots in modelling world are contacting you! They want to have lunch and set up meetings to discuss business and deals and money. One way to show you mean business and to be taken seriously in these meetings is to have your own business card.

Your task:
- Create a business card that you can lay on various projects who are interested in.
- Be sure to include the name and contact information as well as a graphic for visual impact.
- A watermark allows you to use a graphic without overcrowding a limited space

Desktop Publishing Skills
Check these areas for the Skills you need.
- ❏ Labels
- ❏ Text Box
- ❏ Text Art
- ❏ Watermark

Question 8) You have to record your first cooking CD. You are responsible for what's on the Outside of the CD cover.

Your task:
- Create a front and back cover for your CD.
- The Front cover must be visually interesting and include both the name of the CD and the cooking.
- The Back cover must be visually unified with the front and contain the recipe and time to cook at least 10 recipes on the CD.
- While the design part should be fairly easy considering all the skills you have mastered, setting the margins will be a challenge.

- Measure a CD cover and prepare to do some calculating to determine what the four margins should be set.

Desktop Publishing Skills
Check these areas for the Skills you need.
- ❏ Margins
- ❏ TextArt
- ❏ Horizontal Line
- ❏ Text Box
- ❏ Graphic
- ❏ Watermark

References

1. Kumar, B. (2013). *Desktop publishing: Practical Guide to Publish anything on Your Desktop*. V & S publishers.
2. Singh, V.P., & Singh, M. (2008). *Desktop Publishing: course book*. Computech Publications Limited.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1	Introduction: Introduction to desk top publishing.
2	Introduction (contd.): The need of desk top publishing and tools.
3	Master pages preparation: Prepare borders dies, first page.
4	Master pages preparation (contd.): Left and right pages.
5	Layout: Skeleton: Composition, fonts.
6	Layout (contd.): Install: Place objects, Naming, fill text frame, styles.
7	Layout (contd.): Fit text properly in the frame, link text frames, lists, links.
8	Image (contd.): Transform, flow text around.
9	Image (contd.): Path and nodes, effects.
10	Image (contd.): Glyth to vector graphics.

11-12	Cover Design: Design layout, decompose into geometric primitives.
13	Cover Design (contd.): Layers, levels, multilingual layout.
14	Publish: Export, store.
15	Publish (contd.): Print.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Skeleton, layout, transform

System Administration and Maintenance
(BACS10A)
Skill-Enhancement Elective Course - (SEC-4A) Credit:4

Course Objective

The course focuses on administration of operating systems(windows, linux/unix), installation and maintenance. The students will also learn the difference between desktop based and server based operating system.

Course Learning Outcomes

On successful completion of the course, a student will be able to:

1. distinguish between features of Linux/Unix and windows operating system.
2. install/uninstall hardware and software.
3. configure system environment.
4. troubleshoot network connectivity issues.
5. examine system performance issues.
6. examine file structure and properties.

Unit 1

Introduction to Operating system: Basics of operating system, services, features and functions of different operating systems, Kernel, API, CLI, GUI, devices and device drivers, IPv4, IPv6.

Unit 2

Exploring different Operating Systems: Introduction to Linux/Unix based operating systems, introduction to Windows based operating systems, difference between Linux/Unix and other

operating systems, introduction to server based operating systems, difference between desktop based (Windows 10) and server based operating systems like Windows server 2003/2008.

Unit 3

Linux/Ubuntu System Environment: Configuring desktop environment and desktop settings, installing and configuring software and hardware, exploring file structure, terminal, shell, basic Unix Commands like cat, ls, cd, date, cal, man, echo, pwd, mkdir, rm, rmdirps, kill etc.

Unit 4
Windows System Environment: Configuring desktop environment and desktop settings, installing and configuring software and hardware, explore system configuration using control panel, creating users, add/ delete users, difference between workgroup and domain, concept of user profiles – creating and roaming, concept of Active Directory, process and disk management, Windows task manager, exploring file structure and file properties, backup and recovery.

Unit 5
Network Administration : Examine network settings using commands like ipconfig/ifconfig, hostname, net, netstat, whoami etc., troubleshoot network connectivity issues using commands like: ipconfig, ping, tracert, route etc., sharing resources (files, printers etc.) on the network, accessing a system remotely using remote desktop.

Practical
Practicals based on System Administration and Maintenance
1. Installation of LINUX operating system.
2. Installation of WINDOWS operating system
3. Installation of office productivity software (MS Office/ Open Office) .
4. User Management
    a. Graphical tools
    b. Command line tools include commands like useradd, userdel, passwd, etc.
    c. Edit the local configuration files directly using vi editor.
5. Directory management commands
    a. Write a syntax and usage the directory management commands with all options.
        i. Ls command
        ii. cd command
        iii. pwd command
        iv. mkdir command
        v. rmkdir command
6. Process management commands and their execution.
    a. Ps
    b. Kill
    c. nice
7. Study the Firewall Configuration in Windows in detail.
8. Study the Firewall Configuration in Linux.
9. Study the Networks tools like ipconfig/ifconfig, netstat, whoami , trace route , Ping etc.
10. Start-up and shutdown scripts on Linux

References

1. Panek, W., & Wentworth, T. (2010). *Mastering Windows 7 administration*. Wiley Publishing Inc.
2. Snyder, G., Hein, T. R., & EviNemeth, B. W. (2018). *UNIX and Linux System Administration Handbook* (Fifth edition). Pearson.
3. Sobell, M.S. (2014). *A Practical Guide to Ubuntu Linux* (Fourth edition). Prentice Hall.

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2. Limoncelli, T.A., Hogan, C., & Chalup, S. R. (2007). *The Practice of System and Network Administration*. Addison-Wesley.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1	Introduction to Operating system: Basics of operating system, services, features and functions of different operating system.
2	Introduction to Operating system (contd.): Kernel, API, CLI, GUI, devices and device drivers, IPv4, IPv6.
3	Exploring different Operating systems: Introduction to Linux/Unix based operating systems, introduction to Windows based operating systems, difference between Linux/Unix and other operating systems.
4	Exploring different Operating systems (contd.): Introduction to desktop based and server based operating systems.
5	Linux/Ubuntu system environment: Linux desktop tour, configuring desktop environment and desktop settings.
6	Linux/Ubuntu system environment (contd.): Installing and configuring software and hardware, exploring file structure.
7	Linux/Ubuntu system environment (contd.): Terminal, shell, basic Unix commands like cat, ls, cd, date, cal, man, echo, pwd, mkdir, rm, rmdir ps, kill etc.
8	Windows system environment: Windows desktop tour, configuring desktop environment and desktop settings, installing and configuring software and hardware.
9	Windows system environment (contd.): Explore system configuration using control panel, creating users, add/ delete users, difference between workgroup and domain.
10	Windows system environment (contd.): Concept of user profiles – creating and roaming, concept of active directory, process and disk management.
11	Windows system environment (contd.): Windows task manager, exploring file structure and file properties, backup and recovery.
12	Network Administration: Examine network settings using commands like ipconfig/ifconfig, hostname, net, netstat, whoami etc.,

13	Network Administration (contd.): Troubleshoot network connectivity issues using commands like: ipconfig, ping, tracert, route etc.
14-15	Network Administration (contd.): Sharing resources (files, printers etc.) on the network, Accessing a system remotely using remote desktop.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Desktop Operating system, Server Operating system, Shell, Network Administration.

Android Programming
(BACS10B)
Skill-Enhancement Elective Course - (SEC-4B) Credit:4

Course Objective

The course is designed for students to help them learn how to develop android apps. They will also learn android architecture and key principles underlying the design.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. describe various components of an Android application.
2. design user interfaces using various widgets, dialog boxes, menus.
3. design and implement interaction among various activities/applications using intents.
4. develop application(s) that require database handling.

Unit 1

Introduction: Overview of Java programming, Android architecture, Android components including activities, view and view group, services, content providers, broadcast receivers, intents, parcels, instance state. Android development tools like Android virtual device manager, Android SDK manager, Android emulator, Android profiler, Android debug bridge.

Unit 2

User Interface Architecture: application context, intents: explicit intents, returning results from activities, implicit intents, intent filter, intent resolution, and applications of implicit intents, activity life cycle, activity stack, application's priority and the process' states.

Unit 3

User Interface Design: Layouts, optimizing layout hierarchies, form widgets, text fields, button control, toggle buttons, spinners, auto-complete textview, edittext, images, image buttons, menu, dialog.

Unit 4

Database using SQLite: SQLite, Content Values and Cursors, creating SQLite databases, querying a database, adding, updating, and removing rows.

Practical

Practicals Based on Android Programming:
1. Create "Hello World" application. That will display "Hello World" in the middle of the screen in the emulator. Also display "Hello World" in the middle of the screen in the Android Phone.

2. Create an application with login module. (Check username and password).

3. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.

4. Create a menu with 5 options and and selected option should appear in text box.

5. Create a list of all courses in your college and on selecting a particular course teacher-incharge of that course should appear at the bottom of the screen.

6. Create an application with three option buttons, on selecting a button colour of the screen will change.

7. Create and Login application as above. On successful login, pop up the message.

8. Create an application to Create, Insert, update, Delete and retrieve operation on the database.

References

1. Griffiths, D., & Griffiths, D. (2015). *Head First Android Development*. O'reilly.
2. Meier, R. (2012). *Professional Android™ 4 Application Developmen:* John Wiley & Sons, Inc.

Additional Resources

1. Murphy, M. L. (2018). *The Busy Coder's Guide to Android Development*. CommonsWare.
2. Phillips, B., Stewart, C., Hardy, B., & Marsicano, K. (2015). *Android Programming: The Big Nerd Ranch Guide*. Big Nerd Ranch, LLC.
3. Sheusi, J. C. (2013). *Android Application Development for Java Programmers*. Cengage Learning.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions

- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1	Introduction: Overview of Java programming, Android architecture.
2	Introduction (contd.): Android components including activities, view and view group, services, content providers.
3	Introduction (contd.): Broadcast receivers, intents, parcels, instance state. Android development tools like Android virtual device manager,
4	Introduction (contd.): Android development tools like Android SDK manager, Android emulator, Android profiler, Android debug bridge.
5	User Interface Architecture: Application context, intents: explicit intents, returning results from activities, returning results from activities.
6	User Interface Architecture (contd.): Intents: implicit intents, intent filter, intent resolution, and applications of implicit intents.
7	User Interface Architecture (contd.): Activity lifecycle, activity stack, application's priority and the process' states.
8	Database using SQLite: SQLite, content values and cursors.
9	Database using SQLite (contd.): Creating SQLite databases, introduction to querying a database.
10	Database using SQLite (contd.): Querying a database: adding, updating, and removing rows.
11	User Interface Design: Layouts, optimizing layout hierarchies.
12	User Interface Design (contd.): form widgets, text fields, button control.
13-14	User Interface Design (contd.): Toggle buttons, spinners, auto-complete textview, edittext.
15	User Interface Design (contd.): Images, image buttons, menu, dialog.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

Android architecture, Android emulator, User interface design, Database.

Data Visualization using R
(BACS10C)
Skill-Enhancement Elective Course - (SEC-4C) Credit:4

Course Objective

This course is oriented to provide students an introduction to R programming language with a focus to visualize and present data through different type of plots.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. import/export small data sets in and out of R environment.
2. draw different types of plots to aid analysis of datasets.
3. identify a suitable technique for analysis data for the given objective.
4. Interpret and use the results of analysis.

Unit 1

Introduction to R: installation of R, features of R, applications of R programming, data types in R, scripting in R, data editing, use of R as a calculator, control structures in R

Unit 2

Data Handling in R: importing data in R (loading Tables and CSV files), Reading and writing files in R

Unit 3

Basic data structures in R: Vectors, matrices, array, lists, data frames.

Unit 4

Visualization Tools: Introduction to simple graphics and plots, bar charts, histograms, pie charts, scatter plots (plotting multiple variables), line plots and regression, word clouds, radar charts, waffle charts, box plots, exporting plots as images.

Practical

Use data set of your choice from Open Data Portal (https://data.gov.in/) for the following exercises. All visuals must have appropriate legends, and pleasing color schemes. The practical record must contain interpretation of each visual.

1. Find the measures of central tendencies for the data stored in the Excel sheet, CSV file - with and without headers.
2. Plot the scatter plot matrix for this data and and write your observations about the relationship between columns.
3. Plot the probability density curve for each numeric column in the given data.

4. Draw boxplots for each numeric column and examine skewness.
5. Draw suitable visuals to show distribution of categorical attributes.
6. Make visual representations of data using the base, lattice and ggplot2 plotting systems in R, and apply basic principles of data graphics to create rich analytic graphs for available datasets.

Projects and laboratory problems as decided by the department in the beginning of the semester.

References

1. Kabacoff, R. (2011). *R in Action: Data Analysis and Graphics with R*: Manning Publications.
2. Rahlf, T. (2017). *Data Visualization with R: 100 Examples*. Springer.

Additional Resources

1. Adler, J. (2012). *R in a Nutshell: A Desktop Quick Reference* (2nd edition). O'Reilly Media.
2. Davies, T. M. (2016). *The book of R*. (1st Edition). No Starch Press.

Teaching Learning Process

- Talk and chalk method
- Computer based presentations by teachers to explain certain topics.
- Group Discussions
- Assignments
- Offline and online Quiz
- Presentations by group of students for enhanced learning.

Tentative weekly teaching plan is as follows:

Week	Topics
1	Introduction to R: Installation of R, features of R.
2	Introduction to R (contd.): Applications of R programming, basic data types in R.
3	Introduction to R (contd.): Simple scripting in R, data editing.
4	Introduction to R (contd.): Use of R as a calculator
5	Introduction to R (contd.): Control structures in R (conditional statements, loops).
6	Data Handling in R: Importing data in R (loading Tables and CSV files), Reading and writing files in R
7	Basic data structures in R: Vectors, matrices, array.
8	Basic data structures in R (contd.): Lists, data frames.
9	Visualization Tools: Introduction to simple graphics and plots,
10	Visualization Tools (contd.): Bar Charts, histograms.
11	Visualization Tools (contd.): Pie Charts, scatter Plots (plotting multiple variables).

12	Visualization Tools (contd.): Line plots and regression, word clouds.
13	Visualization Tools (contd.): radar charts, waffle charts.
14-15	Visualization Tools (contd.): Box plots, exporting plots as images.

Assessment Methods

- Unit-wise assignments, presentations, viva, quiz as announced by the instructor in the class.
- Internal assessment
- End semester exam

Keywords

R Scripting, Data frames, Data Visualization, Word Cloud.