**PROPOSED SYLLABUS FOR CHOICE BASED CREDIT SYSTEM IN**

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATION (PGDCA)**

**Department of Computer Science**

**North Lakhimpur College (Autonomous)**

Contents

[PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN 2](#_Toc10797375)

[C-101: Computer Fundamentals 4](#_Toc10797376)

[Practical : 4](#_Toc10797377)

[C-102: Database Management System 4](#_Toc10797378)

[Practical: 5](#_Toc10797379)

[C-103: Programming using C 7](#_Toc10797380)

[Practical 7](#_Toc10797381)

[C-201: Computer Networks and Internet Technologies 9](#_Toc10797382)

[Practical : 9](#_Toc10797383)

[C-202: Multimedia Systems and Applications 10](#_Toc10797384)

[Practical: 11](#_Toc10797385)

[C-203: Dissertation / Project work 11](#_Toc10797386)

[E-101 (a): Information Security and Cyber Laws Course 12](#_Toc10797387)

[Practical: 13](#_Toc10797388)

[E-101 (b) : Multimedia and Web Design 13](#_Toc10797389)

[Practical: 13](#_Toc10797390)

[E-201 (a): Software Engineering 14](#_Toc10797391)

[Tutorial: Software Engineering 15](#_Toc10797392)

[E-102 (b): Visual Programming 15](#_Toc10797393)

[Practical: 15](#_Toc10797394)

# PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATION (PGDCA)**

**Department of Computer Science**

**North Lakhimpur College (Autonomous)**

|  |  |  |
| --- | --- | --- |
| **Semester** | **Core Course** | **Elective Courses (E)** |
| **No. of Courses** | **6** | **2** |
| **I** | Computer Fundamentals | Elective-1 |
| Database Management Systems |
| Programming Fundamentals using C |
| **II** | Computer Networks and Internet Technologies | Elective-2 |
| Multimedia Systems and Applications |
| Project Work / Dissertation |

**Core Papers(C): (Credit: 05 each)**

1. Computer Fundamentals
2. Database Management Systems
3. Programming Fundamentals using C
4. Computer Networks and Internet Technologies
5. Multimedia Systems and Applications
6. Project Work / Dissertation

**Elective Papers (E): (Credit: 06 each) – E-1, E-2**

**Elective – 1 (any one)**

1. Information Security and Cyber Laws
2. Multimedia and Web Design

**Elective – 2 (any one)**

1. Software Engineering
2. Visual Programming

|  |  |  |  |
| --- | --- | --- | --- |
| **Semester** | **Course Opted** | **Course Name** | **Credits** |
| **I** | Core course-I | Computer Fundamentals | 3 |
| Core course-I Practical | Computer Fundamentals LAB | 2 |
| Core course-II | Database Management Systems | 3 |
| Core course-II Practical | Database Management Systems LAB | 2 |
| Core course-III | Programming Fundamentals using C | 3 |
| Core course-III Practical | Programming Fundamentals using C LAB | 2 |
| Elective – I | E-I | 3 |
| Elective – I Practical | E-I LAB | 2 |
| **II** | Core course-IV | Computer Networks and Internet Technologies | 3 |
| Core course-IV Practical | Computer Networks and Internet Technologies LAB | 2 |
| Core course-V | Multimedia Systems and Applications | 3 |
| Core course-V Practical | Multimedia Systems and Applications LAB | 2 |
| Core course-VI | Project Work / Dissertation | 5 |
| Elective – II | E-II | 3/4 |
| Elective – II Practical | E-II LAB/Tutorial | 2/1 |
| **Total Credits** | | | **40** |

# C-101: Computer Fundamentals

**1. Introduction:** Introduction to computer system, uses, types. Number systems and character representation, binary arithmetic

**3. Human Computer Interface:** Types of software, Operating system as user interface, utility programs

**2. Devices:** Input and output devices (with connections and practical demo), keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera, monitor, printer, plotter, Primary, secondary, auxiliary memory, RAM, ROM, cache memory, hard disks, optical disks

**3. Computer Organisation and Architecture:** C.P.U., registers, system bus, main memory unit, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors.

**4. Overview of Emerging Technologies:** Bluetooth, cloud computing, big data, data mining, mobile computing and embedded systems.

**5. Office Automation Software:**

i**) Word Processor:** Creating & Editing Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Page Formatting, Bookmark, Mail Merge, Macros, Tables, Save, Printing, Styles, linking, Using Template)

**ii) Spreadsheet:** Creating & Editing Worksheet, Formatting Operations, Formulas and Functions, Inserting Charts, Sorting, Filtering, Table, Validation, Goal Seek

**iii) Presentation Software:**  Creating, Manipulating & Enhancing Slides, Inserting Charts, Word Art, Animations, Picture and Sounds, Inserting Sound and Video, Hyperlinks

**iv) Financial Packages:** Introduction to Tally

**Reference Books:**

1. A. Goel, Computer Fundamentals, Pearson Education, 2010.
2. P. Aksoy, L. DeNardis, Introduction to Information Technology, Cengage Learning, 2006
3. P. K.Sinha, P. Sinha, Fundamentals of Computers, BPB Publishers, 2007

## Practical :

The practical assignment must include connecting parts of a computer and assembling it to an extent, media formatting and installation of some software.

Practical exercises based on Open Office tools using document preparation and spreadsheet handling, presentation packages.

# C-102: Database Management System

**1. Database:** Introduction to database, relational data model, DBMS architecture, data independence, DBA, database users, end users, front end tools

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

**3. Relational Data Model:** Relational model concepts, relational constraints, primary and foreign key, normalization: 1NF, 2NF, 3NF, BCNF

**4. Structured Query Language:** SQL queries, create a database table, create relationships between database tables, modify and manage tables, queries, forms, reports, modify, filter and view data.

**Reference Books :**

1. P. Rob, C. Coronel, Database System Concepts by, Cengage Learning India, 2008
2. R. Elmsasri,S. Navathe Fundamentals of Database Systems, Pearson Education, Fifth Edition, 2007
3. MySQL : Reference Manual

## Practical:

**Practical List**

***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)**

1. Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
2. Delete the record of book titled “Database System Concepts”.
3. Change the Department of the book titled “Discrete Maths” to “CS”.
4. List all books that belong to “CS” department.
5. List all books that belong to “CS” department and are written by author “Navathe”.
6. List all computer (Department=”CS”) that have been issued.
7. List all books which have a price less than 500 or purchased between “01/01/1999” and “01/01/2004”.

***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).**

1. Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
2. 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.
3. List all students who live in “Delhi” and have marks greater than 60 in paper 1.
4. Find the total attendance and total marks obtained by each student.
5. List the name of student who has got the highest marks in paper 2.

***3)*** Create the following tables and answer the queries given below:

**Customer (CustID, email, Name, Phone, ReferrerID)**

**Bicycle (BicycleID, DatePurchased, Color, CustID, ModelNo)**

**BicycleModel (ModelNo, Manufacturer, Style)**

**Service (StartDate, BicycleID, EndDate)**

1. Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
2. List all the customers who have the bicycles manufactured by manufacturer “Honda”.
3. List the bicycles purchased by the customers who have been referred by customer “C1”.
4. List the manufacturer of red colored bicycles.
5. 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 ( Person\_Name, Street, City )**

**WORKS ( Person\_Name, Company\_Name, Salary )**

**COMPANY ( Company\_Name, City )**

**MANAGES ( Person\_Name, Manager\_Name )**

1. Identify primary and foreign keys.
2. Alter table employee, add a column “email” of type varchar(20).
3. Find the name of all managers who work for both Samba Bank and NCB Bank.
4. Find the names, street address and cities of residence and salary of all employees who work for “Samba Bank” and earn more than $10,000.
5. Find the names of all employees who live in the same city as the company for which they work.
6. Find the highest salary, lowest salary and average salary paid by each company.
7. Find the sum of salary and number of employees in each company.
8. Find the name of the company that pays highest salary.

***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, Qunatity)**

1. Identify primary and foreign keys.
2. Get supplier numbers for suppliers in Paris with status>20.
3. Get suppliers details for suppliers who supply part P2. Display the supplier list in increasing order of supplier numbers.
4. Get suppliers names for suppliers who do not supply part P2.
5. For each shipment get full shipment details, including total shipment weights.
6. Get all the shipments where the quantity is in the range 300 to 750 inclusive.
7. Get part nos. for parts that either weigh more than 16 pounds or are supplied by suppliers S2, or both.
8. Get the names of cities that store more than five red parts.
9. Get full details of parts supplied by a supplier in Delhi.
10. Get part numbers for part supplied by a supplier in Allahabad to a project in Chennai.
11. Get the total number of project supplied by a supplier (say, S1).
12. Get the total quantity of a part (say, P1) supplied by a supplier (say, S1).

# C-103: Programming using C

**1. Introduction to C and C++**

History of C, Overview of Procedural Programming and Object-Orientation Programming, Using main() function, Compiling and Executing Simple Programs in C.

**2. Data Types, Variables, Constants, Operators and Basic I/O**

Declaring, Defining and Initializing Variables, Scope of Variables, Using Named Constants, Keywords, Data Types, Casting of Data Types, Operators (Arithmetic, Logical and Bitwise), Using Comments in programs, Character I/O (getc, getchar, putc, putcharetc), Formatted and Console I/O (printf(), scanf(), cin, cout), Using Basic Header Files (stdio.h, conio.het c).

**3. Expressions, Conditional Statements and Iterative Statements**

Simple Expressions in C (including Unary Operator Expressions, Binary Operator Expressions), Understanding Operators Precedence in Expressions, Conditional Statements (if construct, switch-case construct), Understanding syntax and utility of Iterative Statements (while, do-while, and for loops), Use of break and continue in Loops, Using Nested Statements (Conditional as well as Iterative)

**4. Functions and Arrays**

Utility of functions, Call by Value, Call by Reference, Functions returning value, Void functions, Return data type of functions, Functions parameters, Differentiating between Declaration and Definition of Functions, Command Line Arguments/Parameters in Functions

Creating and Using One Dimensional Arrays (Declaring and Defining an Array, Initializing an Array, Accessing individual elements in an Array, Manipulating array elements using loops), Use Various types of arrays (integer, float and character arrays / Strings) Two-dimensional Arrays (Declaring, Defining and Initializing Two Dimensional Array, Working with Rows and Columns), Introduction to Multi-dimensional arrays

**5. Pointers in C**

Understanding a Pointer Variable, Simple use of Pointers (Declaring and Dereferencing Pointers to simple variables), Pointers to Pointers, Pointers to structures, Problems with Pointers, Passing pointers as function arguments, Returning a pointer from a function, using arrays as pointers, Passing arrays to functions.

**Reference Books**

**Books:**

1. Dromey, G: How to solve it by computer, PHI (EEE),
2. Kanitkar: Let us C
3. Karnighan and Ritchie: The C Programming Language

## Practical

1. WAP to print the sum and product of digits of an integer.
2. WAP to reverse a number.
3. WAP to compute the sum of the first n terms of the following series S = 1+1/2+1/3+1/4+……
4. WAP to compute the sum of the first n terms of the following series S =1-2+3-4+5……………
5. Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.
6. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.
7. WAP to compute the factors of a given number.
8. WAP to perform following actions on an array entered by the user:
   1. Print the even-valued elements
   2. Print the odd-valued elements
   3. Calculate and print the sum and average of the elements of array
   4. Print the maximum and minimum element of array
   5. Remove the duplicates from the array
   6. Print the array in reverse order

The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter array and to quit the program.

1. Write a macro that swaps two numbers. WAP to use it.
2. WAP that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.
3. Write a program that swaps two numbers using pointers.
4. Write a program in which a function is passed address of two variables and then alter its contents.
5. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
6. Write a program to find sum of n elements entered by the user.
7. Write a menu driven program to perform following operations on strings:
   1. Show address of each character in string
   2. Concatenate two strings without using strcat function.
   3. Concatenate two strings using strcat function.
   4. Compare two strings
   5. Calculate length of the string (use pointers)
   6. Convert all lowercase characters to uppercase
   7. Convert all uppercase characters to lowercase
   8. Calculate number of vowels
   9. Reverse the string
8. Write a menu driven program to perform following operations on strings:
9. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
10. WAP to display Fibonacci series (i)using recursion, (ii) using iteration
11. WAP to calculate Factorial of a number (i)using recursion, (ii) using iteration
12. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.

# C-201: Computer Networks and Internet Technologies

**1. Computer Networks:** Introduction to computer network, data communication, components of data communication, data transmission mode, data communication measurement, LAN, MAN, WAN, wireless LAN, internet, intranet, extranet.

**2. Network Models:** Client/ server network and Peer-to-peer network, OSI, TCP/IP, layers and functionalities.

**3. Transmission Media:** Introduction, Guided Media: Twisted pair, Coaxial cable, Optical fiber. Unguided media: Microwave, Radio frequency propagation, Satellite.

**4. LAN Topologies:** Ring, bus, star, mesh and tree topologies.

**5. Network Devices:** NIC, repeaters, hub, bridge, switch, gateway and router.

**6. Internet Terms:** Web page, Home page, website, internet browsers, URL, Hypertext, ISP, Web server, download and upload, online and offline.

**7. Internet Applications:** www, telnet, ftp, e-mail, social networks, search engines, Video Conferencing, e-Commerce, m-Commerce, VOIP, blogs.

**8. Introduction to Web Design:** Introduction to hypertext markup 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.

**9. Scripting Languages:** JavaScript, PHP basics

**Reference Books:**

* + 1. Andrew S. Tanenbaum, David J. Wetherall Computer Networks (5th Edition),PHI, 2010
    2. B. A. Forouzan, Data Communication and Networking , TMH,2003.
    3. D.R. Brooks, An Introduction to HTML and Javascript for Scientists and Engineers, Springer
    4. HTML A Beginner's Guide, Tata McGraw-Hill Education, 2009.
    5. J. A. Ramalho, Learn Advanced HTML 4.0 with DHTML, BPB Publications, 2007

## Practical :

Networking exercises in a trial lab, where effects of different connectors, topologies in practical could be demonstrated.

Before moving to JavaScript practicals, students must get an idea about fundamental programing using Scratch (https://scratch.mit.edu). Students should be encouraged to learn Scratch on their own and work on assignments available online such as https://sites.google.com/site/christopherscfahs/scratch-programming/scratch-assignments or http://scratched.gse.harvard.edu/resources/uw-catapult-project .

Alternatively, students may use Alice (http://www.alice.org/index.php) and learn basic programming. A lot of online assignments and spoken tutorials on YouTube would be helpful.

Practical exercises based on concepts listed in theory using 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 Form with Input Type, Select and Text Area in HTML.

4. Create an HTML containing Roll No., student’s name and Grades in a tabular form.

**List of Practicals using Scratch : (self-learning by students)**

3. Join the Scratch community on scratch.mit.edu. Explore featured projects and modify any one of them.

4. Create a game using SCRATCH similar to that of Beach Baby Volleyball. The game MUST meet the following objectives.

5. Create a website of 6 – 7 pages with different effects as mentioned in above problems.

• Have at least 3 sprites. All of which move, bounce, fall, etc. 10 pts.

• Edit at least one of the sprites in some way to make it your own. 10 pts.

• Make some or all sprites move with the use of certain keys. 15 pts.

• Create or use a given background on your game. 10 pts.

• Incorporate sound into your game. 10 pts.

• Use a counter or score keeper in your game. 15 pts.

• Must include a forever loop, show, hide, and “when I receive.” 30 pts.

**List of Practicals using Javascript :**

Create event driven program for following:

1. Print a table of numbers from 5 to 15 and their squares and cubes using alert.

2. Print the largest of three numbers.

3. Find the factorial of a number n.

4. Enter a list of positive numbers terminated by Zero. Find the sum and average of these numbers.

5. A person deposits Rs 1000 in a fixed account yielding 5% interest. Compute the amount in the account at the end of each year for n years.

6. Read n numbers. Count the number of negative numbers, positive numbers and zeros in the list.

# C-202: Multimedia Systems and Applications

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

**2. Text:** Fonts & Faces, Using Text in Multimedia, Font Editing & Design Tools, Hypermedia & Hypertext.

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

**4. Sound:** Digital Audio, MIDI Audio, MIDI vs Digital Audio, Audio File Formats.

**Video:** How video works, analog video, digital video, video file formats, video shooting and editing.

**5. Animation:** Principle of animations, animation techniques, animation file formats.

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

**7. Making Multimedia**: Stages of a multimedia project, Requirements to make good multimedia, Multimedia Hardware - Macintosh and Windows production Platforms, Hardware peripherals - Connections, Memory and storage devices, Multimedia software and Authoring tools.

**References:**

1. Tay Vaughan, “Multimedia: Making it work”, TMH, Eighth edition.

2. Ralf Steinmetz and Klara Naharstedt, “Multimedia: Computing, Communications Applications”, Pearson.

3. Keyes, “Multimedia Handbook”, TMH.

4. K. Andleigh and K. Thakkar, “Multimedia System Design”, PHI.

## Practical:

Practical exercises based on concepts listed in theory using Presentation tools in office automation tool/ GIMP/Blender / Audacity/ Animation Tools/ Image Editors/ Video Editors.

Implement the followings using Blender -

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 followings-

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 tools

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.

# C-203: Dissertation / Project work

The students will be allowed to work on any project based on the concepts studied in core/elective

The group size should be maximum of three (03) students.

Each group will be assigned a teacher as a supervisor who will handle both their theory as well lab classes.

Amaximum of Four (04) projects would be assigned to one teacher.

Theory classes will cover project management techniques.

# E-101 (a): Information Security and Cyber Laws Course

**1. Introduction:** Computer network as a threat, hardware vulnerability, software vulnerability, importance of data security.

**2. Digital Crime:** Overview of digital crime, criminology of computer crime.

**3. Information Gathering Techniques:** Tools of the attacker, information and cyber warfare, scanning and spoofing, password cracking, malicious software, session hijacking

**4. Risk Analysis and Threat:** Risk analysis, process, key principles of conventional computer security, security policies, authentication, data protection, access control,

internal vs external threat, security assurance, passwords, authentication, and access control, computer forensics and incident response

**5. Introduction to Cryptography and Applications :** Important terms, Threat, Flaw, Vulnerability, Exploit, Attack, Ciphers, Codes, Substitution Cipher (Caeser), Transposition Cipher (Rail-Fence), Public key cryptography (Definitions only), Private key cryptography (Definition and Example), Cyber forensics, Steganography

**6. Safety Tools and Issues :** Firewalls, logging and intrusion detection systems, Windows and windows XP / NT security, Unix/Linux security, ethics of hacking and cracking

**7. Cyber laws to be covered as per IT 2008:**

• Chapter 1: Definitions

• Chapter 2: Digital Signature And Electronic Signature

• [Section 43] Penalty and Compensation for damage to computer, computer system, etc.

• [Section 65] Tampering with Computer Source Documents

• [Section 66 A] Punishment for sending offensive messages through communication service, etc.

• [Section 66 B] Punishments 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

**Reference Books:**

1. M. Merkow, J. Breithaupt, Information Security Principles and Practices, Pearson

Education.

2. G.R.F. Snyder, T. Pardoe, Network Security, Cengage Learning, 2010

3. A. Basta, W.Halton, Computer Security: Concepts, Issues and Implementation,

Cengage Learning India, 2008

4. Anderson, Ross. Security engineering. John Wiley & Sons, 2008. (Freely available online)

## Practical:

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

2. Use of Password cracking tools : John the Ripper, Ophcrack. Verify the strength of passwords using these tools.

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

4. Perform encryption and decryption of a Rail fence cipher. Write a script for performing these operations.

5. Use nmap/zenmap to analyse a remote machine.

6. Use Burp proxy to capture and modify the message.

7. Demonstrate sending of a protected word document.

8. Demonstrate sending of a digitally signed document.

9. Demonstrate sending of a protected worksheet.

# E-101 (b) : Multimedia and Web Design

**1. Multimedia :** Definition, Components, uses, applications

**2. Multimedia Input/Output Devices:** scanner, camera, microphone, speaker, monitors, printers.

**3. Multimedia Storage Devices:** CD ROMs, DVDs, Blue ray disk.

**4. Multimedia Tools:** Sound editor, video editor, animator, authoring tools.

**5. Web Designing:** Concept of website, website as a communication resource. Internet, intranet and extranet, basic concepts related to website designing.

**6. HTML:** Introduction to hypertext markup language (html) document type definition, creating web pages, graphical elements, lists, hyperlinks, tables, web forms, inserting images, frames, use of CSS

**Reference Books:**

1. Scott Mitchell , Create your own website , SAMS Publication , 2008

2. Tay Vaughan, Multimedia : Making it work, Tata McGraw Hill, Seventh edition, 2006

3. J. Jeffcoate, Multimedia in Practice, Pearson Education, First Edition, 2007

## Practical:

Practical exercises based on concepts listed in theory using Presentation tools in office automation tool/ GIMP/Blender / Audacity/ Animation Tools/ Image Editors/ Video Editors.

Implement the followings using Blender -

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 followings-

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 tools

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.

# E-201 (a): Software Engineering

**1. Introduction to Software Engineering:** Challenges-Scale-Quality and Productivity-Consistency and Repeatability-Change, Software Engineering approach-Phased Development Process-Managing the Process

**2. Software Process:** Desired characteristics-Predictability-Maintainability-Change supportive-Early Defect Removal, Software Process models: Waterfall model-Prototyping-Iterative-Timebox, Comparison of the models.

**3. More Software Processes:** Project Management Process-Inspection Process-Configuration.

**4. Management Process:** Requirements change management process-Process management process.

**5. Software Requirement Specification (SRS):** Need for SRS-Requirement process, and Data dictionary, Characteristics of SRS, Components of an SRS.

**6. Design:** Software design: Function oriented, user interfaces. Software programming: Structured coding techniques, coding styles.

**7. Verification, Validation & Testing**

Software verification and validation, black box and white box approaches, integration and system testing.

**8: Software reliability& Maintenance**

Definition and concept of reliability, software faults, errors, Repair and availability. Categories of Maintenance, Problem during maintenance..

**Reference Books**

1. Pankaj Jalote, An Integrated approach to software engineering (third edition), Narosa, 2003

2. Roger S. Pressman ,Software Engineering (Sixth edition) , Tata McGraw Hill,2009

## Tutorial: Software Engineering

# E-102 (b): Visual Programming

**Use any open source alternative such as Tkinter with Python /SharpDevelop/GAMBAS/OPENXAVA with JAVA or any other**

1. **GUI Environment:** Introduction to graphical user interface (GUI), programming language (procedural, object oriented, event driven), the GUI environment, compiling, debugging, and running the programs.

**2. Controls :** Introduction to controls textboxes, frames, check boxes, option buttons, images, setting borders and styles, the shape control, the line control, working with multiple controls and their properties, designing the user interface, keyboard access, tab controls, default & cancel property, coding for controls.

**3. Operations:** Data types, constants, named & intrinsic, declaring variables, scope of variables, val function, arithmetic operations, formatting data.

**4. Decision Making :** If statement, comparing strings, compound conditions (and, or, not), nested if statements, case structure, using if statements with option buttons & check boxes, displaying message in message box, testing whether input is valid or not.

**5. Modular programming:** Menus, sub-procedures and sub-functions defining / creating and modifying a menu, using common dialog box, creating a new sub-procedure, passing variables to procedures, passing argument by value or by reference, writing a function/ procedure.

**6. Forms Handling :** Multiple forms creating, adding, removing forms in project, hide, show method, load, unload statement, me keyword, referring to objects on a different forms

**7. Iteration Handling:** Do/loops, for/next loops, using msgbox function, using string function

**8. Arrays and Grouped Data Control:** Arrays - 1-dimension arrays, initializing an array using for each, user-defined data types, accessing information with user-defined data types, using list boxes with array, two dimensional arrays. lists, loops and printing list boxes & combo boxes, filling the list using property window / additem method, clear method, list box properties, removing an item from a list, list box/ combo box operations.

**9. Database Connectivity:** Database connectivity of forms with back end tool like mysql, populating the data in text boxes, list boxes etc. searching of data in database using forms. Updating/ editing of data based on a criterion.

**Reference Books:**

**1.** Reference: Programming in Visual Basic 6.0 by Julia Case Bradley, Anita C. Millispangh (Tata Mcgraw Hill Edition 2000 (Fourteenth Reprint 2004))

## Practical:

1. Print a table of numbers from 5 to 15 and their squares and Cubes.

2. Print the largest of three numbers.

3. Find the factional of a number n.

4. Enter a list of positive numbers terminated by zero. Find the sum and average of these numbers.

5. A person deposits Rs. 1000 in a fixed account yielding 5% interest. Complete the amount in the account at the end of each year for n years.

6. Read n numbers. Count the number of negative numbers, positive numbers and zeros in the list.

7. Read n numbers. Count the number of negative numbers, positive numbers and zeroes in the list.use arrays.

8. Read a single dimension array. Find the sum and average of these numbers.

9. Read a two dimension array. Find the sum of two 2D Array.