

Program: BCA

Semester: Fourth

Course: Computer Graphics

Course Code: 3C.273

L	T	P	C
3	0	0	3

Course Objective:

- Understand the structure of modern computer graphics systems
- Understand the basic principles of implementing computer graphics primitives
- Familiarity with key algorithms for modeling and rendering graphical data
- Develop design and problem solving skills with application to computer graphics
- Gain experience in constructing interactive computer graphics programs

Unit I:

Computer Graphics and their applications. Overview of Graphics system. Display Devices: CRT Monitors (Random Scan and Raster Scan, DVST, Plasma – Panel Display, LED and LCD Monitors).

Unit II:

Graphics Software. Elementary Drawing: Points and various line drawing Algorithms and their comparisons efficiency contact. Cycle generating algorithms other objects like ellipses, arcs, section spirits. Two Dimensional Geometric Transformations: Basic Transformations, Matrix Representations and Homogeneous coordinates, Composite Transformations, Reflection and Shear, Transformations between Coordinates Systems.

Unit III:

Raster Methods for Transformations. Two-Dimensional Viewing: The Viewing Pipeline, Viewing Coordinate Reference Frame, Window-to-View Port coordinate Transformation.

Unit IV:

Clipping- Point, Line (Cohan-0Sutherland Line Clipping and Liang –Barsky Line Clipping and Nicholl-Lee-Nicholl Line Clipping) and Polygon Clipping(Sutherland-Hodgeman Polygon Clipping, Weiler-Atherton Polygon Clipping).

Suggested Readings:

1. Computer Graphics by Donal Hearn M. Pardive Baker (PHI) Easter Economy Edition.
2. Computer Graphics by Roy A. Plastockand Gordon Kalley – Schaum's Series.
3. Computer Graphics by Marc Berger.
4. J. F. Koegel Buferd -Multimedia Systems, Pearson Education, New Delhi,
5. J.D.Foley- Computer Graphics, 2ndEdn, Pearson Education, New Delhi

Program: BCA

Semester: Fourth

Course: Computer Graphics Lab

Course Code: 3CP.273

L	T	P	C
0	0	2	1

Course Objective:

- Demonstrate an understanding of contemporary graphics hardware.
- Create and formulate interactive graphics applications in programming language e.g C.
- Understand and explain the mathematical and theoretical principles of computer graphics. Eg: To draw basic objects like lines, triangles and polygons using built-in functions.
- Implement programs that demonstrate geometrical transformations.
- Understand about the modern software that are used in current scenario used in computer graphics.

Program:

1. Program to draw a point
2. Program to draw line.
3. Program to draw a circle.
4. Program to draw a rectangle
5. Program to draw an arc.
6. Program to draw an ellipse. .
7. Program to draw a polygon.
8. Program to draw a filled polygon.
9. Program to draw a concentric circle.
10. Program to draw a sector.
11. Program to draw pie slice.
12. Program to draw a bar.
13. Program to draw a 3D bar.
14. Program to draw pie chart.
15. Program to draw bar chart.
16. Program to draw 3D Bar chart.
17. Program to draw a kite.
18. Program to draw a mesh ball.
19. Program to draw smiley face.
20. Program to draw a car.

Program: BCA

Semester: Fourth

Course: Data Communication

Course Code: 3C.271

L	T	P	C
4	0	0	4

Course Objective:

- Explain the importance of data communications and the Internet in supporting business communications and daily activities.
- Explain how communication works in data networks and the Internet.
- Recognize the different internetworking devices and their functions.
- Explain the role of protocols in networking.
- Analyze the services and features of the various layers of data networks.
- Design, calculate, and apply subnet masks and addresses to fulfill networking requirements.
- Analyze the features and operations of various application layer protocols such as Http, DNS, and SMTP.

Unit I:

Introduction: Data Communication: Components, Data Flow; Network Categories: LAN, MAN, WAN (Wireless / Wired); Data Transmission Basic Concepts and Terminology: Data Communication Model, Communication Tasks, Parallel & Serial Transmission, Transmission Models, Transmission Channel, Data Rate, Bandwidth Signal Encoding Schemes, Data Compression, Transmission Impairments

Unit II:

Concept of layers, protocols, interfaces and services; Reference Model: OSI, TCP/IP and their Comparison, Computer Network: Network Topology, Performance of Network, Network Classification, Advantages & Disadvantages of Network,

Unit III:

Transmission Media (guided and unguided) Twisted pair, coaxial cable, fiber optics, wireless transmission (radio, microwave, infrared); Circuit Switching & Packet Switching. Physical Layer: Concept of Analog & Digital Signal; Bit rate, Bit Length;

Unit IV:

Transmission Impairments: Attenuation, Distortion, Noise; Data rate limits: Nyquist formula, Shannon Formula; Multiplexing: Frequency Division, Time Division, Wavelength Division; Data Link Layer: Need for Data Link Control, Frame Design Consideration, Flow Control & Error Control (Flow control mechanism, Error Detection and Correction techniques)

Suggested Readings:

1. Andrew S. Tanenbaum : "Computer Networks", Pearson Education
2. Behrouz A Forouzan : Tata Mcgraw Hill
3. William Stallings : "Data and Computer Communications", Pearson Education.
4. Douglas E. Comer : "Internet working with TCP/IP", Pearson Education.
5. Kurose Ross : Computer Networking: A top down approach, 2nd Edition, Pearson Education

Program: BCA

Semester: Fourth

Course: Unix and Shell Programming

Course Code: 3C.251

L	T	P	C
3	0	0	3

Course Objective:

- To learn the basic UNIX operating systems and its basic commands.
- Understand the buffer representation, kernels and system calls.
- Explain the system structure, implementation of system calls.
- Understand the UNIX segmentation, paging and scheduling.
- Understand the Drivers and IPC.

Unit I:

Unix utilities – 1

Introduction to Unix file system .vi editor, functions of the following commands cp, mv, in, rm, unlink, mkdir, re\mdir, du, df, mount, umount, find. umask, ps, who, w, finger, atp, ftp, telnrt, rlogin.

Unix utilities -2

The processing utilities and backup utilities. Detailed commands to be covered are : cat, tail, head, sort, nl, uniq, grep, fgrep, cut, past, jointee, more, pg, comm., cmp, diff, tr, awk, tar, cpio.

Unit II:

What is a shell, shell responsibilities. The shell as programming language shell variables conditions history and control structures and shell programming.

Unit III:

Unix Internals – 1

Unix file structure, directories, files and devices, system calls and device drivers, library functions, Low-Level file access (write, read, open, close, ioctl, lseek, fstat, stat, dup and dup2), the standard I/O (fopen, fread, fclose, fflush, fseek, fgetc, getc, getchar, fputc, putc putchar, fgets, gets), formatted I/O, Stream Errors, streams and file descriptors, File and directory maintenance (chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd).

Unit IV:

Unix Internals – 2

Process and Signals: What is process, process structure, starting new process, waiting for a process, zombie process, process control: process identifiers, fork function, vfork, exit, wait, exec, system functions, user identification, process times signal:-

Signal functions, unreliable signals, interrupted system calls, kill and raise functions, alarm, pause functions, abort, system, sleep functions.

Suggested Readings:

- 1.UNIX: Concepts & Applications, Sumitava Das, TMH
- 2.Your UNIX –The Ultimate Guide, Sumitava Das, TMH

Program: BCA

Semester: Fourth

Course: Unix and Shell Programming Lab

Course Code: 3CP.251

L	T	P	C
0	0	2	1

Course Objective:

- Recognize, understand and make use of various UNIX commands
- Gain hands on experience of UNIX commands and shell programs
- Writing the shell scripts and shell programs
- Understand the basics of UNIX administration

Program:

1. To create a file?
2. To manipulate the contents of a file?
3. To delete a file(s)?
4. To rename a file?
5. To copy a file from one directory to another directory?
6. To move a file from one directory to another directory?
7. To change the permissions of a file?
8. To list the contents of a file(s)?
9. To rename a directory?
10. Script to find a given number is even or odd?
11. Script to find a year whether it is a leap or not? Get the year from the system date.
12. Script to generate Fibonacci series.
13. Script to find a factorial of a given number

Program: BCA

Semester: Fourth

Course: Numerical Analysis and Statistical Methods

Course Code: 3C.272

L	T	P	C
4	0	0	4

Course Objective:

- Formulate and solve linear programming problems and operations with nonlinear expressions.
- Able to find the mean and the variance of a random variable.
- Able to find the confidence interval for the mean of a normal population from a sample.
- Able to find the sample regression line.
- Ability to solve financial math problems.
- Ability to solve basic problems in probability and statistics.
- Ability to solve the equation by Newton-Raphson Method.

Unit I:

Numerical Method : Algebraic equation –Bisection Method ,Regula Falsi Method ,and Newton Raphson Method, Gauss elimination Method and Iterative Method –Gauss sidle and Jacobi’s Method.

Unit II:

Interpolation – Lagrange’s interpolation formula, Difference operator and Difference table. Newton’s forward and backward difference interpolation formula.

Unit III:

Numerical Differentiation and Integration: Trapezoidal Rule and Simpson’s $1/3^{\text{rd}}$ and $3/8^{\text{th}}$ rule.

Unit IV:

Statistic: Probability Distribution, Binomial and Normal Distribution, correlation, Rank correlation.

Suggested Readings:

1. V.Rajaraman: Computer oriented Numerical Methods, Prentice Hall of India Private Ltd. New Delhi.
2. B.S Grewal, Numerical Method for Engineering, Sultan Chand Publication.
3. S.S Shastri Numerical Analysis.
- 4.V.K. Kapoor Mathematical statistics, S.Chand & Sons .

Program: BCA

Semester: Fourth

Course: Professional skills

Course Code: 40B.251

L	T	P	C
2	0	0	2

Course Objective:

It is student-centric, value based, activity oriented professional education, where the Faculty is not only the disseminator of common wealth of knowledge and experience but the organizer of learning situations, facilitator of the learning process and co coordinator of learning following the age old adage of “**I hear, I forget, I see, I remember, I do, I understand**”

- In this unit the students get opportunities to apply their classroom learning to practical situation. This course aims to develop the professional traits in them, so that they can meet the neo-challenges of job opportunities.
- Students become the architect of their career goals.
- Acquire leadership traits,
- Interpersonal skills,
- Adaptability, discussion skills, interview skills etc..

Unit I: DISCUSSION SKILLS

- Introduction
- Importance of Group Discussion Skills
- Process, Scope & Limits of Group Discussion
- Group Discussion, Interaction Strategies, Individual Contribution
- Leadership Skills, Team Management, Creating Friendly Co-operative Atmosphere
- Selection Group Discussion, Interactive Oral Process, Purposeful & Goal Oriented Characteristics, Agreement on Group Goals, Agreement on Procedure, Effective Communication, Equitable Distribution of Time; Speaking & Listening Skills; Adaptability; Assertiveness; Command Over the Subject

Unit II: NEGOTIATION SKILLS

- Speaking & Listening Skills
- Rapport Building
- Decision Making Ability
- Problem Solving Skill
- Attitudes
- Adaptability
- Conflict Handling Ability

Unit III: JOB SEARCH & CORRESPONDENCE SKILLS

- Introduction; Job Search Strategies
- Developing Job Communication Skills
- Skill Analysis
- Job Communication Process
- Creating Network,
- Prelude; Biodata, Curricula Vitae (CV) Resume

- Determining the Need of the Employer
- Relevant Information Analysis
- Preparing Final Draft
- Developing Confidence, Apprehension, Set Realistic Goals, Negative Thoughts
- Stress Reduction Techniques
- Follow up Correspondence

Unit IV: INTERVIEW SKILLS

- Interview; Introduction
- The Interview Process
- Types of Interview; Face to Face, Group Interview, Through Video Conferencing, Telephonic,
- Skype, Panel Interview
- Planning/Purpose
- Pre-Interview Techniques
- Answering Strategies
- Follow up

Suggested Books & Readings:

- Monippally, Matthukutty. M. 2001. Business Communication Strategies. 11th Reprint. Tata McGraw-Hill. New Delhi
- Swets, Paul. W. 1983. The Art of Talking So That People Will Listen: Getting Through to Family, Friends and Business Associates. Prentice Hall Press. New York
- Lewis, Norman. 1991. Word Power Made Easy. Pocket Books
- Sen , Leena .Communication Skills ; Eastern Economy Edition
- Ghanekar , Dr. Anjali . Essentials of Business Communication Skills ; Everest Publishing House
- David Green . Contemporary English Grammar, Structure & Composition ; MacMillan
- Dictionary; Oxford
- Dictionary ; Longman

Websites

- www.tatamcgrawhill.com/digital_solutions/monippally
- www.dictionary.cambridge.org
- www.wordsmith.org
- www.edufind.com
- www.english_the_easy_eay.com
- www.englishclub.com
- www.english_grammar_lessons.com
- www.wikipedia.org/wiki/english_grammar