

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES  
DEVI AHILYA UNIVERSITY, INDORE**

**MCA (6 Years)**

**VI SEMESTER**



**January 2019 - April 2019**

<b>Sub. Code</b>	<b>Sub. Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
IC-611	Computer Graphics	3	1	0	4
IC-601A	Human Computer Interaction	3	1	0	4
IC-612	UNIX Operating System	3	1	0	4
IC-604	System Analysis & Design	3	1	0	4
IC-606B	Project	3	1	0	4
IC-608B	UNIX Lab	0	0	4	2
IC-608C	Computer Graphics Lab	0	0	4	2
IC-607	Comprehensive Viva	0	0	0	4
					28

INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE  
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IC- 611 : Computer Graphics

**Unit -I**

**Introduction and need of computer graphics:** Definition of Computer Graphics, Broad Areas of Computer Graphics (Generative Graphics, Cognitive Graphics, Image Processing), Application of Computer Graphics.

**Block diagram of computer graphics systems:** Necessary hardware requirements for Computer Graphics systems. **Graphics display devices:** CRT, Color CRT, Direct View Storage Comparison between them. **Flat panel devices:** Plasma, LCD, LED, Comparison between these technologies.

**Basic concepts and terminologies of computer graphics:** Pixel, Frame Buffer, Refresh rate, Persistence, Aspect Ratio, Numerical problems. **Block diagram of raster scan and random scan system:** Vectored Graphics, Graphics Card, Video Controller, Graphics Processing Units GPUs. CPU v/s GPU. **Input devices:** Scanners, Handheld, BarCode Reader(s), Mouse, Keyboard. **Output devices:** Hard Copy devices: Printer, Plotter(s). Bio metric input/output devices.

**Unit -II**

**Output primitives:** Development and implementation of algorithms for basic graphics output. Point plotting, Line drawing (using Cartesian equations, Parametric equations, Digital Differential Analyzer DDA, Bresenham's algorithm with all cases), Circle and ellipse drawing algorithms, Numerical problems.

**Polygon(s) representation:** Definition ,types (Convex and Concave), Inside Outside Test with (4 and 8 Connected Points) ,Filling of Polygon , Circle and ellipse.

**Unit -III**

**2D Transformation:** Mathematical Background of Transformation, Homogeneous co ordinates Derivations of Transformations (Translation, Reflection, Rotation, Scaling, Shearing, Reflection about arbitrary line  $y = m x + c$  ), Related numerical problems and Programs.

**3D Transformation:** Mathematical Background of Transformation, Derivations of Transformations (Translation, Reflection, Rotation, Scaling, Shearing, Reflection, Projections), related numerical problems and Programs.

**Segmentation:** (Refer chapter5, from book *Computer Graphics by Steven Harrington*) Display files, segment table, creating, closing, renaming, and deletion of segments.

#### **Unit-IV**

**Introduction to windowing:** Definitions of world coordinate system, normalized device coordinates, viewport coordinate systems, 2D viewing transformation, Window to viewport transformation.

**Introduction to clipping:** (Point, line, Polygon, Curve, Text clipping), Algorithm for point and line clipping, Cohen Sutherland line clipping, Parametric LiangBarsky line clipping algorithm, Polygon clipping, Sutherland Hodgeman Algorithm.

#### **Unit-V**

**Introduction to design of curves:** Parametric equations of curve, interpolation and approximation approach for curve representation, Piecewise curves, Splines, Cubic Splines, zeroorder, Firstorder, second order, parametric and geometric Continuity, Bezier curves, Bezier surfaces, BSpline curves and their properties.

**Hidden Surface and Back face Detection:** Depth Buffer algorithm, Painters algorithm.

#### **Books:**

1. Computer Graphics by D Hearn and P M Baker, Printice Hall of India (Indian Edition).
2. Computer Graphics (Principles and Practice) by Foley, van Dam, Feiner and Hughes, Addisen Wesley (Indian Edition).
3. Computer Graphics by Atul P. Godse and Deepali A. Godse, Technical Publications
4. Computer Graphics by Steven Harrington published by McGrawHill
5. Computer Graphics by Zhigang Xiang and Roy Plastock, Schaum's outline, Second Edition

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**IC- 601A : HUMAN COMPUTER INTERACTION**

**UNIT-I** Introduction - Importance of user Interface – definition, importance of good design, Benefits of good design. A brief history of Screen design.

**UNIT-II** The Graphical user interface - popularity of graphics, the control of direct manipulation, graphical system, Characteristics, web user-Interface popularity, characteristics-Principle of user interface.

**UNIT-III** Design process – Human interaction with computers, importance of human characteristics human consideration. Human interaction speed, understanding business junctions.

**UNIT-IV** Screen Design- Design goals- Screen planning and purpose, organizing screen elements, ordering of screen data and content- screen navigation and flow Visually pleasing composition- amount of information- focus and emphasis presentation information simply and meaningfully- information retrieval on web, statistical graphics technology consideration in interface design.

**UNIT-V** Windows-New and navigation schemes selection of window, selection of devices based and screen based controls, Components- text and messages, Icons and increase –Multimedia, colors, uses problems, choosing colors.

**UNIT –VI**

Software tools- specification methods, interface building tools

Interaction Devices- Keyboard and function keys- pointing devices- speech recognition and generation- image and video displays- drivers. Case Study 1-

Multi-Key press Hindi Text Input Method on Mobile Phone. Case Study 2- GUI design for a mobile phone based Matrimonial application. Case study 3-

Employment information system for unorganized construction workers on a mobile Phone.

**TEXT BOOKS:** 1. The essential guide to user interface design, Wilbert O Galitz, Wiley DreamTech. 2 Designing the user interface, 3rd Edition Ben Shneidermann Pearson Education Asia.

**REFERENCES:**1 Human –Computer Interaction ALAN DIX,JANET FINCAY,GRE GORED,ABOWD,RUSSWELL BEALG,PEARSON 2Interaction Design PRECE ROGERS SHARPS Wiley Dreamtech, 3User Interface Design. Soren ,PEARSON EDUCATION

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**IC- 612 : UNIX Operating System**

**Aim of Course:** To develop an understanding of basic concepts of operating system with special reference to UNIX operating system.

**Objectives:**

The course is designed to make students:

- Understand UNIX as operating system.
- Learn to use UNIX shell.
- Learn to use UNIX commands.
- Send and receive electronic mail and learn its real-world limitations
- Learn File handling and shell programming.

**Course Contents:**

**UNIT I**

Introduction and familiarization: History of UNIX operating system, Architecture of Unix login and log out

**UNIT II**

UNIX file system: File system hierarchy: file name, attributes, access rights and their change, copying moving and removal of files.

File permission mask, /etc/passwd file, su, newgrp, chown, chgrp commands. Contents of file and file commands. Hard and Soft links, search in file system find command.

**UNIT III**

Filters, standard input and standard output, pipes, pipelines, simple text manipulation utilities, utilities for comparing text files. Regular expression grep, egrep, fgrep, programmable filters sed, awk. Back up of files and directories, tar, cpio, dd.

**UNIT IV**

UNIX shell: Basic UNIX user skill, shell as command language, interpreter, command line, shell file metacharacter, script writing, examples of script. Process, ps, shell as process, job control, signals. Vi editor

**UNIT V**

Shell programming concept. Shell script control statements, loops, branching, return codes, test statements, shell parameters.

**Text Books:**

1. Sumitabha Das, UNIX: Concepts and application.

**Reference Books:**

1. Maurice J. Bach, The design of the UNIX operating system.
2. Y. Kanetkar, UNIX shell programming
3. Kamran Hussain, Linux Unleashed, Tim Parker.
4. Christopher Vickery, UNIX shell programmer's Interactive Workbook.

5. Mark F. Komarinsk, Cary Colette, Linux system administration handbook.
6. Dent and Gaddis, Guide to using Linux

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**IC- 604 : System Analysis & Design**

**Aim of Course:** To introduce established and evolving methodologies for the analysis, design, and development of an information system.

**Objectives:** The course is designed to make students:

- Understand system characteristics, project management, prototyping, and systems development life cycle phases.
- To analyze a problem and design an appropriate solution using a combination of tools and techniques.

**Prerequisite(s):** Knowledge of following concepts is required, computer applications and software's, computer programming, Database management systems.

**Course Contents:**

**UNIT- I**

**Overview of system analysis and design:** Systems concepts, Definition, Characteristics of a system, Elements of a system, Types of System Physical or Abstract System, Open or Closed Systems, Man-Made Information Systems: Categories of Information, Formal Information Systems, Informal Information Systems.

**UNIT- II**

**System Development Life Cycle:** Recognition of need, feasibility study, Analysis, Design, Implementation, Post implementation and Maintenance, Project Termination, Prototyping.

**Role of the system Analyst:** Definition, Skills, Academic and Personal Qualifications, The Multifaceted Role of Analyst.

**UNIT- III**

**System Analysis:**

**System Planning and the Initial Investigation:** Bases of Planning in System Analysis, Dimensions of Planning, Initial Investigation, Needs Identification, Strategies for Determining Information Requirements, Problem Definition and Project Initiation, Background Analysis: Fact-Finding, Fact Analysis, Determination of Feasibility.

**Structured Analysis:** Introduction, Tools of Structured Analysis: Dataflow Diagrams, Data Dictionaries, Decision Tables, Decision Trees, Structured English.

**Feasibility study:** Introduction, Feasibility Considerations, Feasibility Study Stages, Feasibility Report, Cost/Benefit Analysis.

**UNIT- IV**

**System design:**

**The Process and Stages of System Design: Introduction, The Process of Design:** Logical and Physical Design, Design Methodologies: Structured Design, Form-Driven Methodology – The IPO Charts.

**Input /Output and Form Design:** Introduction, Input Design, Output Design, Form Design.

**File Organization and Data Base Design:** Introduction, File Structure, File Organization, Data Base Design, Views of Data, Data Structure.

#### **UNIT- V**

**System Implementation, Post Implementation and Maintenance:** Introduction, Testing objectives, System Testing, Types of System Tests, Quality Assurance: Quality Factors Specifications, Levels of Quality Assurance, Post Implementation and Maintenance, Project Scheduling, Project management.

#### **Text Books:**

1. System Analysis and Design by Elias M. Awad (GALGOTIA Publications)

#### **Reference Books:**

2. Analysis and Design of Information Systems by V. Rajaraman (PHI Publications)
3. System Analysis and Design & MIS by Anurag Jain (EXCEL BOOKS Publications)