KURUKSHETRA UNIVERSITY KURUKSHETRA

SCHEME OF STUDIES / EXAMINATIONS

Bachelor of Technology (Information Technology)

Semester – V (w.e.f. Session 2017-18)

S. No.	Course No.	Course Title	Teaching Schedule				Allotment of Marks				Duration of Exam (Hrs.)
			L	T	P	Hours/ Week	Theory	Sessional	Practical	Total	
1.	IT-301N	Linux Operating System	4	1	--	5	75	25	--	100	3
2.	IT-303N	Introduction to Digital & Data Communication	4	–	--	4	75	25	--	100	3
3.	IT-305N	JAVA Programming	4	1	--	5	75	25	--	100	3
4.	IT-307N	Multimedia & Virtual Reality	4	–	--	4	75	25	--	100	3
5.	IT-309N	Computer Graphics	4	1	--	5	75	25	--	100	3
6.	IT-311N	Computer Graphics Lab	--	–	3	3	---	40	60	100	3
7.	IT-313N	Multimedia Lab	--	–	2	2	---	40	60	100	3
8.	IT-315N	JAVA Programming Lab	--	–	3	3	---	40	60	100	3
9.	IT-317N	Linux Lab	----	–	2	2	--	40	60	100	3
10.	IT-319N	Industrial Training-I	1	–	---	1	---	100	----	100	
		Total	**21**	**3**	**10**	**34**	**375**	**385**	**240**	**1000**	

Note: Industrial Training which was undergone by the students after IV sem is to be evaluated during V sem as **(IT-319N)** through submission of certified computerized report to the Head of the Department followed by viva-voce, seminar/presentation.

IT-301 N	Linux Operating System					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3 (Hrs.)
Purpose	The course helps students to prepare for the real world in which there is a diversity of operating system & platform.					
CO 1	To familiarize with basic commands of Linux.					
CO 2	To study Linux networking and file system.					
CO 3	To understand the installation of server.					
CO 4	Security in Linux.					

Unit-1

Introduction: Basic concepts of the operating system. Commands, shells and processes; users and groups; file system and directories. System installation, configuration and upgrade Installation stages; network installation; disk partitioning; post-install system customization and upgrade; dpkg and APT package installation, remove, upgrade and query; semiautomatic system installation.
Kernel: Kernel tasks; managing kernel modules at runtime; kernel configuration and compilation boot loaders GRUB and LILO.

Unit-2

Linux Networking: Basic concepts of networking: Network packets, TCP/IP protocol suit, address resolution protocol (ARP); IP addresses and network mask; subnets and routing; IPV4 and Network classes; ports. Configuring Linux machine on the network; arp, ipconfig and netstat commands. Network services and tools; telnet, rsh, ftp, rcp, ssh, rsync, inetd.conf; opening and closing ports.
Network File system (NFS): File system sharing or the network; remote procedure call (R P C) services; NFS server and client sides; NFS installation & configuration; and statistic mount and auto mount configuration; when trouble shooting NFS; security and optimization
Network information service (NIS): Centralized authentication systems; sharing user and host information or the network; IS server and client sides and configuration; compatibility mode; net group; security issues.

Unit –3

Integrating Linux and Windows: Elements of windows networking; Net BIOS SMB\ \ CIFS protocols; domain controller; Samba server on Linux for centralized window logon; file sharing and printing, samba client; samba installation and configuration; Unix and windows password. Dual Boot: running windows and Linux on the same PC; GRUB and NT Boot loaders; accessing windows files systems from Linux and vice versa;
Light Weight Directory Access Protocol (LDAP): Overview of Unix authentication and naming service; introduction to LDAP: Domain component (DC); organizational Unit (OU); common names (CN); Schemas; IDIF format; services; polls and commands; server and client sides; Open LDAP installation and configuration; LDAP applications. Shell scripting, syntax of brash; looping; case statement; function; command substitution; awk, grep, sed. Startup and Run Levels. Scheduled jobs. Boot up and login process sequence; run levels; startup scripts; scheduling jobs with at and cron.

Unit-4

Linux Security: System vulnerabilities; port scanning; encryption, encrypted services and connections; PGP/GPG Intrusion protection: tcp-wrappers, IP-firewalls (iptables), NAT and DMZ; Intrusion detection systems: tripwire; Secure system management practices.
Email Server: Steps of Email transaction; Email envelope and headers; SMTP servers; IMAP and POP3 servers; E-mail relay; Postfix configuration; Spam and viruses,
Domain Name Server (DNS): Host name resolution; domain name hierarchy; DNS zones; configuration of master, slave and caching DNS servers with BIND 9.

Text Books

1. Bell & Duff , *Red Hat Linux 9* –- Pearson.
2. Richard L. Peterson , *Complete Reference, Red Hat Linux*—TMH.
3. Tery Dawson, Gregor N. Purdy, Tony Bautts ; *Linux N/W Administration Guide*– OREILLY.

Reference Books

1. Christopher Negus , *Red Hat Linux 9 Bible*- WILEY publishing.
2. Patrick Volker Ding, Kevin Richard, Eric Foster-Johnson, *Linux Configuration & Installation* BPB publication.
3. John Goerzen, *Linux Programming Bible* -Wiley Dream Tech India (P) Ltd.

NOTE: Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT - 303 N	Introduction to Digital & Data Communication					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	--	--	75	25	100	3(Hrs.)
Purpose	To provide the knowledge of digital data communication					
CO 1	To introduce the concept of communication.					
CO 2	To study pulse modulation.					
CO 3	To educate about the various modulation techniques in digital communication					
CO 4	To understand various methods for data transmission.					

Unit-1

Introduction

What is communication , Elements of communication system , Signal , Concept of bandwidth , sources of signal , Types of communication channels , classification of electronic communication system , Modulation , Introduction to analog modulation system – AM , FM , PM ; Elements of Digital communication system , Comparison of analog and digital modulation , advantages and disadvantages of digital communication , Limitations of communication system , Electromagnetic spectrum for communication

Unit-2

Pulse Modulation:

Sampling theorem, Nyquist rate, Introduction to PAM, PWM, PPM; Quantization, Introduction to PCM and delta modulation, Introduction to TDM and FDM

Unit-3

Digital Modulation

Line coding, introduction to Encoding schemes: RZ , NRZ ; Modulation Techniques – ASK-FSK-PSK-QPSK

Unit-4

Digital data Transmission

Classification: Parallel, Serial, Asynchronous and synchronous transmission; Error Detection and correction techniques: Parity checks, Hamming code; DTE & DCE interface,
Introduction to: a) RS-232C, b) RS-449, c) USB , d) HDMI.

Text Books:

1. Proakis, *"Digital Communications"*, Mc Graw Hill.
2. Sanjay Sharma , *" Digital communication"* , S.K. Kataria and sons

Reference Books :

1. W.Stalling, *"Wireless Communication And Networks"* , Pearson.
2. Stallings, *"Data & computer Communications"*, PHI.
3. Forouzen, *"Data Communication & Networking"*, Tata Mcgraw Hill.
4. Miller, *"Introduction to Digital & Data Communications"*, Jaico Pub.

NOTE: The course is introductory in nature. Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-305 N	JAVA Programming					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3(Hrs.)
Purpose	To understand design and implementation of various software applications.					
CO 1	To study basic concept of OOP.					
CO 2	Learn about the interfaces, multithreading in JAVA.					
CO 3	To study database connectivity with JAVA.					
CO 4	To familiarize the student to server side programming.					

Unit-1

Introduction to Java & Principles of Object Oriented Programming: Basic Concepts of OOP and it's Benefits. Application of OOP. The Creation of Java, Importance of Java for the Internet, Java's Magic: The Byte-code, Features of Java. Object-Oriented Programming in Java, Java Program Structure.

Defining Classes: Defining of a Class, Definition of Methods, Constructors, Creating Objects of a Class, Assigning Object Reference Variables, The keyword "this" , Defining and Using a Class, Automatic Garbage Collection.

Arrays and Strings: Arrays, Arrays of Characters, String handling Using String Class, Operations on String Handling Using. String Buffer Class.

Extending Class and Inheritance: Using Existing Classes, Class Inheritance, Choosing Base Class, Access Attributes, Polymorphism, Multiple Levels of Inheritance, Abstraction through Abstract Classes, Using Final Modifier, The Universal Super class-Object Class.

Unit-2

Package & Interfaces: Understanding Packages, Defining a Package, Packaging up your Classes, Adding Classes from a Package to your Program, Understanding CLASSPATH, Standard Packages, Access Protection in Packages, Concept of Interface.

Exception Handling: The Idea behind Exceptions, Types of Exceptions, Dealing with Exceptions, Exception Objects, Defining Your Own Exceptions, Checked and Unchecked Exceptions.

Multithreading Programming: The Java Thread Model, Understanding Threads, The Main Thread, Creating a Thread: extending Thread and implementing Runnable, Creating Multiple Threads, Thread Priorities, Synchronization, Deadlocks inter-thread communication, Deadlocks.

Input/Output in Java: I/O Basic, Byte and Character Structure, I/O Classes, Reading Console Input, Writing to Console Output, Reading and Writing on Files, Random Access Files, Storing and Retrieving Objects from File. Stream Benefits.

Unit-3

Creating Applets in Java: Applet Basics, Applets Architecture, Applet Life Cycle, Simple Applet Display Methods, Requesting Repainting, Using the Status Window, The HTML APPLET Tag, Passing parameters to Applets.

Java Data Base Connectivity (JDBC): Database Connectivity- Relation Databases, JDBC API, Reusing Database Objects, Transactions, Advance Techniques.

Working with Windows: AWT Classes, Window Fundamentals, Working with Frame, Creating a Frame Window in an Applet, displaying information within a Window.

Unit-4

Event Handling: Two Event Handling Mechanisms, The Delegation Event Model, The Event Handling Process, Event Classes, Sources of Events, event Listener Interfaces, Using the Delegation Event Model, Adapter Classes.

Java Servlet Programming: Role and Advantages of Java Servlets in Web application Development.

HTTP Servlets- Introduction, page generation, server side includes, servlet chaining, java Server pages.

Server Life Cycle: Servlet Alternative, Reloading, Init and Destroy, Single Thread Model, Background Processing Last Modified times, synchronization, Persistent state capabilities.

Text Books / Reference:

1. Herbertz Schildt , *The complete Reference Java,* Mc Graw.
2. Ivor Horton , *Beginning JAVA 2 (JDK1.3 Edition),* , WROX Public.
3. Bruce Eckel , *Thinking in Java,* Prentice Hall.
4. Jamie Jaworski, "*Java Unleashed",* SAMS Techmedia Publication, 1999.
5. JAVA 2 (1.3) API Documentations.
6. E. Balaguruswamy , *"Programming with Java"* , Tata McGraw-Hill Education.

NOTE: Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-307 N	Multimedia & Virtual Reality					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
4	-	-	75	25	100	3 (Hrs.)
Purpose	To familiarize with different techniques and tools of multimedia applications.					
CO 1	Introduction to basics of multimedia technologies.					
CO 2	To study file system and information model of multimedia.					
CO 3	To familiarize with the animation in multimedia.					
CO 4	To study the virtual reality concepts.					

UNIT - 1

Basics of Multimedia Technology: Computers, communication and entertainment, multimedia an introduction & emerging applications, framework for multimedia systems, multimedia devices, CD-AUDIO,CD_ROM, multimedia presentation tools.
Audio, Video And Image: Digital representation of sound, transmission of digital sound, MPEG-Audio ,audio compression and decompression, brief survey of speech recognition and generation, musical instrument digital interface, evaluating a compression system-redundancy and visibility , video compression techniques, JPEG-image compression standards, MPEG-motion video compression standard-DVI Technology

UNIT - 2

Multimedia File Systems and Information Models: The case of multimedia information system, file support for continuous media-data models for multimedia and hyper media information, multimedia presentation and authoring, current state of industry-design paradigms and user interface-barriers to widespread use, multimedia system service architecture, media stream protocol and services and window system, client control of continuous media, file system support, hyper applications.

UNIT - 3

Multimedia Communication Systems: Multimedia services over the public network, requirements, architecture and protocols-applications-network services-network protocols-multimedia interchange :Quicktime movie file format(QMF)-MHEG(Multimedia and Hypermedia information and coding expert group)-format function and representation summary-real time interchange-Multimedia conferencing: teleconferencing systems.
Animation: Introduction, Basic terminology techniques, Motion graphics 2D & 3D animation. Introduction to MAYA (Animating tool): Fundamentals, Modeling: NURBS, Polygon, Organic, animation, paths & boxes, deformers, working with MEL: Basics & programming Rendering &special effects: shading & texturing surfaces lighting, special effects.

UNIT - 4

Virtual Reality: Introduction to Virtual Reality, Four key elements of virtual reality - a) virtual world, b) immersion, c) sensory feedback d) interactivity, ; Desktop virtual reality, VR operating system, virtual environment displays & orientation making; visually coupled system requirements; intelligent VR software systems.

Text Books:

1. David Hillman ,*"Multimedia Technology & Applications"*, Galgotia publications.
2. John.F.Koegel Buford, *Multimedia Systems*, Pearson education,1994.
3. John Villamil Louis Molina , *Multimedia An Introduction* PHI.
4. Jose Lozano , *Multimedia: Sound & video*, PHI(Que)
5. Sherman & Craig. *Understanding Virtual Reality – Interface, Application, and Design*, Morgan Kaufmann, 2002.

Reference Books:

1. John Villamil *Multimedia : Production, planning and delivery* , Que E&T, 1997.
2. Jeff Coate Judith , "*Multimedia in Action*", 1995, PHI.
3. Norman Desmarais, *Multimedia on the PC: A Guide for Information Professionals,* Mc Graw Hill.
4. Ze-Nian Li and Mark S.Drew, *Fundamentals of Multimedia* , Pearson education.

NOTE: Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-309 N	Computer Graphics					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
4	1	-	75	25	100	3 (Hrs.)
Purpose	To provide the conceptual knowledge of Computer Graphics.					
CO 1	Introduction to different graphics algorithm.					
CO 2	To acquaint with viewing system and clipping.					
CO 3	To study different transformation techniques and projection of an object.					
CO 4	To familiarize with 3D curves and surfaces.					

Unit – 1

Introduction: What is Computer Graphics, Computer Graphics Applications, Two dimensional Graphics Primitives: Points and Lines, Point Plotting Techniques: Coordinate system, Incremental Method, Line drawing algorithms: DDA & Bresenhams's; Circle generating algorithms: Using polar coordinates, Mid point circle drawing algorithms . Filled area algorithms: Scan line polygon filling algorithms, Boundary filled algorithms.
Graphic devices: Light pen, Mouse, Tablet, Touch panel, Digitizers

Unit – 2

Two Dimensional Viewing: Two dimensional geometric transformations, Viewing pipeline, Window to view port transformation, Window to view port mapping.
Clipping: Point & Line clipping algorithm, Cohen-Sutherland Line clipping algorithms, Polygon clipping: Sutherland-Hodgeman Polygon clipping algorithm. Curve clipping, Text clipping.

Unit – 3

Three Dimensional Viewing: Introduction to Three-dimensional display methods : Parallel & Perspective Projection , depth cueing , surface rendering ; Three-Dimensional Geometric and Modeling Transformations; Viewing pipeline, Viewing coordinates,.

Unit – 4

Representation of 3-D Curves and Surfaces: Curved lines and surfaces, spline representations, interpolation and approximation splines, Parametric continuity conditions, Geometric continuity conditions.
Bezier curves and surfaces: Bezier curves, properties of Bezier curves, Bezier surfaces, B-spline curves and surfaces.
Hidden Surfaces removal: Classification of Visible-Surface Detection algorithms , Hidden surface elimination, depth buffer algorithm, scan line coherence and area coherence algorithm, priority algorithm.
Introduction to animation: Design of Animation Sequences, General Computer-Animation Functions, Morphing

Text Books

1. Hern & Baker – *Computer Graphics*, 2nd Ed. PHI.
2. Newmann & Sprawl – *Introduction to interactive Computer Graphics*, MGH.

Reference Books

1. Harrington – *Computer Graphics* – A programming Approach.
2. Rogers – *Principles of Computer Graphics* – MGH.
3. Folay – *Fundamental of Interactive Computer Graphics* – Addison Welsey

NOTE: The course is introductory in nature. Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-311 N	Computer Graphics Lab					
Lecture	Tutorial	Practical	Minor Test	Practical Exam	Total	Time
--	--	3	40	60	100	3(Hrs.)
Purpose	To provide the conceptual knowledge of Computer Graphics.					
CO 1	To implement different graphics algorithm.					
CO 2	To perform practical on viewing system and clipping.					
CO 3	To study different transformation techniques and projection of an object.					
CO 4	To implement Beizer curve					

List of experiments:

1. Write a program to implement DDA line drawing algorithm.
2. Write a program to implement Bresenham's line drawing algorithm.
3. Implement the Bresenham's circle drawing algorithm.
4. Write a program to implement the midpoint circle drawing algorithm.
5. Write a program to implement 2-D transformations.
6. Write a program to show a ball moving on the screen according to the given requirements.
7. Write a program to implement the midpoint circle drawing algorithm.
8. Write a program to implement the Beizer curve.
9. Implement the line clipping algorithm using C.
10. Implement boundary fill algorithm using C.
11. Implement the depth buffer algorithm using C.

Note: A student has to perform 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-313 N	Multimedia Lab					
Lecture	Tutorial	Practical	Minor Test	Practical Exam	Total	Time
--	--	2	40	60	100	3(Hrs.)
Purpose	To familiarize different techniques and tools of multimedia applications.					
CO 1	Introduction to basics of multimedia technologies.					
CO 2	Creation of websites					
CO 3	To study animation in multimedia.					
CO 4	To use adobe photoshop for editing.					

List of experiments:

1. Create any two slides using power point
2. Create a website on any of your favorite topic.
3. Create a website of your college using HTML tags
4. Perform the following using Movie star:
    a) Video Capturing
    b) Video Editing and
    c) Creating Video CD.
5. Animate a ball using Flash
6. Using Adobe Deluxe Photoshop edit a digital photo by changing the background color, changing the theme, changing the part of the photo and editing the different parts of the photo.
7. Animate the following using GIF animator:
    a) Image
    b) Banner Text
8. Perform the following using Multimedia Software:
    a) Clip a portion of an audio wave file
    b) Add another audio file to the above clipped file
9. Perform the following using Multimedia software
    a) Extract audio from video file like .avi/.dat/.mpeg and save it in MP3
    b) Change the format of above audio file into midi/wav/asf/wm/cda

Note: A student has to perform 9 experiments. At least seven experiments should be performed from the above list. Two experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-315 N	JAVA Programming Lab					
Lecture	**Tutorial**	**Practical**	**Minor Test**	**Practical Exam**	**Total**	**Time**
--	--	3	40	60	100	3(Hrs.)
Purpose	To introduce the principles and paradigms of Java Programming.					
CO 1	Introduction to the concept of OOP.					
CO 2	To implement various programs in JAVA					
CO 3	To study database connectivity with JAVA.					
CO 4	To study server side programming					

List of experiments:

1. Write a program to illustrate the concept of simple and multilevel inheritance.
2. Write a program to illustrate the concept of "this" keyword.
3. Write a program to illustrate the concept of Constructor and method Overloading.
4. Write a program to draw a Pyramid in JAVA.
5. Write a program to implement Binary Search.
6. Write a program to illustrate the concept of Threads by using yield (), stop (), and sleep () methods.
7. Write a program to illustrate the concept of synchronization in Threads.
8. Write a program to illustrate the concept of applets.
9. Write a program to draw shapes using Graphics Methods
10. Write a program to read a record into database using JDBC Connectivity.
11. Write a program to illustrate the concept of Event Handling

Note: A student has to perform 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-317 N	Linux Lab					
Lecture	**Tutorial**	**Practical**	**Minor Test**	**Practical Exam**	**Total**	**Time**
--	--	2	40	60	100	3(Hrs.)
Purpose	To introduce the student to Linux OS					
CO 1	To explore basic commands of Linux.					
CO 2	To study Linux networking and file system.					
CO 3	To learn installation of server.					
CO 4	To familiarize with administration of Linux operating system					

LIST OF EXPERIMENTS

1. Install Linux on the system dual boot with the windows Operating System.
2. Do the following tasks :-
   a) Create, remove & resize various types of partitions through GUI as well as command line.
   b) Configure printers in Linux through GUI as well as command line.
3. Creating, Removing of Swap space as well as swap files trough command line as well as GUI.
4. Implementation Disk Quotas- enabling, creating, mounting, configuring, assigning, disabling.
5. Managing Users and Groups in Linux- Adding, Modifying, Password aging.
6. Configuration Networks on Linux through GUI & Command Line- Ethernet, Modem, ISDN, Wireless.
7. Configuring NFS (Network File System) on Linux both GUI & Command Line.
8. Configuring Samba server on Linux both GUI & Command line.
9. Configuring D.N.S (Domain Name system) server on Linux both GUI & Command Line.
10. Configure an e-mail server in Linux-send mail.
11. Configuring Firewalls and managing various services of Linux.
12. Configuring Log Server in Linux.

Note: A student has to perform 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.