UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Lecture-wise Plan

Subject Name: Data Communication & Computer Networks   Subject Code-BCA501

Year: 3rd Year   Semester: Fifth

Module Number	Topics	Number of Lectures
	Data Communication Fundamentals:	**10L**
1	1. Layered Network Architecture; Data and Signal; Guided Transmission Media; Unguided Transmission Media; Transmission Impairments and Channel Capacity; Transmission of Digital Signal; Analog Data to Analog Signal; Digital Data to Analog Signal; Multiplexing of Signals: The telephone system and DSL technology; Cable MODEM and SONET	10
	Data Link control:	**6L**
2	1. Interfacing to the media and synchronization; Error Detection and Correction; Flow and Error control; Data Link Control.	10
	Switching Communication Networks:	**8L**
3	1. Circuit switching; Packet switching; Routing in packet switched networks; Congestion control in packet switched networks; X.25; Frame Relay; Asynchronous Transfer Mode Switching (ATM).	8
	Broadcast communication networks:	**10L**
4	1. Network Topology; Medium Access Control Techniques; IEEE CSMA/CD based LANs; IEEE Ring LANs; High Speed LANs – Token Ring Based; High Speed LANs – CSMA/CD based; Wireless LANs; Bluetooth; Cellular Telephone Networks; Satellite Networks.	10
	Internetworking:	**6L**
5	1. Internetworking Devices; Internet Protocols; TCP/IP; Transport and Application layer protocols. Network Security: Cryptography; Secured Communication; Firewalls.	6
Total Number Of Hours = 40		

Assignments:

Module-1:
1. Write down the functions of OSI Layers
2. What will be SNR value in case of noiseless channel?
3. Define Bandwidth? Create the relationship between Bit Rate and Baud Rate?

Module-2:
1. What is the significance of sequence number in Stop & Wait ARQ protocol?
2. Discuss Stop & Wait ARQ with 010101 bit sequence?

Module-3:
1. Differentiate between circuit switching and packet switching.
2. Write short notes on the following topic:
   A. Frame Relay
   B. X.25

Module-4:
1. Discuss CSMA/CA with the help of a flowchart.
2. Why CSMA/CD is not implemented in WLAN?
3. Describe 802.3 header formats. Why padding is required?

Module-5:
1. What is distance vector routing protocol? What is the difference between RIP and EGP?
2. Distinguish between gateway and bridge. What is transparent bridge?
3. A network has subnet mask 255.255.255.224 Determine the maximum or number of Host in this network. Also determine the broadcast address of this network.
4. Write the differences between ARP and RARP?
5. Write the differences between TCP and UDP?

6. Write the short notes on the following
   A. DNS
   B. FTP
   C. EMAIL
   D. MIME
   E. POP3
   F. SMTP
7. How are 'iterative query resolution and 'recursive query resolution different from each other in the context of DNS?
8. Define Firewall? Discuss all types of Firewall.

Lecture-wise Plan

Subject Name: UNIX and Shell Programming　　　　**Subject Code-BCA502**
Year: 3rd Year　　　　　　　　　　　　　　　　　**Semester: Fifth**

Module Number	Topics	Number of Lectures
1	**Introduction:**	**5L**
	1. Organization of UNIX.	2L
	2. User interface, Programmer interface.	3L
2	**System calls**	**12L**
	1. The environment of UNIX process System calls.	4L
	2. Process control, File related system calls.	4L
	3. Process related system calls. Signals programming using system calls.	4L
3	**I/O**	**4L**
	1. Advanced I/O multiplexing. Memory mapped I/O.	4L
4	**Inter-process communications**	**9L**
	1. Interprocess communication: Pipes, shared memory, semaphores, messages.	5L
	2. Advanced inter-process communications. Streams, Pipes, Open server	4L

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Assignment:
Module-1 (Introduction):
　　1.　　User interface vs programmer interface

Module-2 (System calls):
　　1.　　Different system calls.

Module-3 (I/O):
　　1.　　Advanced Memory mapped I/O

Module-4 (Interprocess communication):
　　1.　　Interprocess communication
　　2.　　Pipes

UNIVERSITY OF ENGINEERING & MANAGEMENT,JAIPUR
Lecture-wise Plan

Subject Name: Windows Programming　　　　　**Subject Code-BCA503**
Year: 3rd Year　　　　　　　　　　　　　　**Semester: 5th**

Module Number	Topics	Number of Lectures
1	**Introduction to Windows Programming and Visual Basic:**	**12L**
	Components of Windows Programming: Graphical User Interface – Window and its elements – Dialog Box – Drop-Down and Pop-Up menus – Visual Basic – Event-Driven Programming – Steps in Building a Project – User Interface Design – Writing Code – Visual Basic IDE – Creating and Running a simple project	12L
2	**Visual Basic Forms and Controls:**	**8L**
	Form – Tool Box controls – Property window – Design and Run-time properties – Events – Keyboard, Mouse, Code and System events – Visual Basic Object oriented programming – Creating buttons at run-time through object declaration - Screen, Printer, Error Objects	8L
3.	**Visual Basic Programming:**	**9L**
	Visual Basic Data Types - Constants: predefined constants – User-Defined constants – Variables – Scope Rules – Control Structures – If – Select Case – Loops – FOR , DO, WHILE loops – Goto – On Goto statements – Event procedures – User defined procedures – Library functions – Numeric, String, Boolean and miscellaneous functions – Sub Main() procedure – User-defined functions – Public, Private Scope rules – Creating EXE files – Arrays – User-defined data type – Type statement – Control Arrays – Graphics handling – Using multiple forms – Activating a form – Multiple Document Interface – A simple MDI application	9L
4	**Visual Basic Advanced Features Creating a Database in VB**	**10L**
	Accessing an external database with Data Control – Object Linking and Embedding (OLE): Linking and embedding an excel worksheet with VB project – Using third-party controls in VB - Creating an Active X control project – Activating other applications from VB – Windows Application Program Interface functions (WINAPI)	10L
	Total =	**39L**

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Assignment:
   1. **Minor project (Window Application)**
   2. **Major project (Window application)**

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Lecture-wise Plan

Subject Name: Advanced UNIX and Shell Programming **Subject Code-BCA501A**

Year: 3rd Year

Semester: Fifth

Module Number	Topics	Number of Lectures
1	**Introduction:**	**6L**
	1. Overview, Network of Networks, Intranet, Extranet and Internet.	1L
	2. **World Wide Web:** Domain and Sub domain, Address Resolution, DNS, Telnet, FTP, HTTP.	1L
	3. **Review of TCP/IP:** Features, Segment, Three-Way Handshaking, Flow Control, Error Control, Congestion control, IP Datagram, IPv4 and IPv6.	1L
	4. **IP Subnetting and addressing:** Classful and Classless Addressing, Subnetting. NAT, IP masquerading, IP tables.	1L
	5. **Internet Routing Protocol:** Routing - Intra and Inter Domain Routing, Unicast and Multicast Routing, Broadcast.	1L
	6. **Electronic Mail:** POP3, SMTP.	1L
2	**HTML, Image Maps, Extensible Markup Language, CGI Scripts:**	**9L**
	1. Introduction of Editors, Elements, Attributes, Heading, Paragraph. Formatting, Link, Head, Table, List, Block, Layout, CSS. Form, Iframe, Colors, Colorname, Colorvalue.	3L
	2. Map, area, attributes of image area.	1L
	3. Introduction of Tree, Syntax, Elements, Attributes, Validation, Viewing. XHTML in brief.	4L
	4. Introduction, Environment Variable, GET and POST Methods.	1L
3	**PERL, JavaScript, Cookies, Java Applets:**	**10L**
	1. Introduction of Variable, Condition, Loop, Array, Implementing data structure, Hash, String, Regular Expression, File handling, I/O handling.	3L
	2. Basics, Statements, comments, variable, comparison, condition, switch, loop, break. Object – string, array, Boolean, reg-ex. Function, Errors, Validation.	4L
	3. Definition of cookies, Create and Store a cookie with example.	1L

	4.	Container Class, Components, Applet Life Cycle, Update method; Parameter passing applet, Applications.	2L
4	**Client-Server programming In Java, Threats,Network security techniques, Firewall:**		**4L**
	1.	A) Java Socket, Java RMI. 1. B) Malicious code-viruses, Trojan horses, worms; eavesdropping, spoofing, modification, denial of service attacks.	2L
	2.	A) Password and Authentication; VPN, IP Security, security in electronic transaction, Secure Socket Layer (SSL), Secure Shell (SSH). B) Introduction of Packet filtering, Stateful, Application layer, Proxy	2L
5	**Internet Telephony, Multimedia Applications, Search Engine and Web Crawler:**		**5L**
	1.	Introduction of VoIP.	1L
	2.	Multimedia over IP: RSVP, RTP, RTCP and RTSP. Streaming media, Codec and Plugins, IPTV.	2L
	3.	Definition, Meta data, Web Crawler, Indexing, Page rank, overview of SEO.	2L
Total Number Of Hours = 34			

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UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Lecture-wise Plan

Subject Name: Internet Technology (IT)　　　　　　**Subject Code-BCA504A**

Year: 3rd Year　　　　　　　　　　　　　　　　　　Semester: Fifth

Module Number	Topics	Number of Lectures
1	**Introduction:**	**6L**
	1. Overview, Network of Networks, Intranet, Extranet and Internet.	1L
	2. **World Wide Web:** Domain and Sub domain, Address Resolution, DNS, Telnet, FTP, HTTP.	1L
	3. **Review of TCP/IP:** Features, Segment, Three-Way Handshaking, Flow Control, Error Control, Congestion control, IP Datagram, IPv4 and IPv6.	1L
	4. **IP Subnetting and addressing:** Classful and Classless Addressing, Subnetting. NAT, IP masquerading, IP tables.	1L
	5. **Internet Routing Protocol:** Routing - Intra and Inter Domain Routing, Unicast and Multicast Routing, Broadcast.	1L
	6. **Electronic Mail:** POP3, SMTP.	1L
2	**HTML, Image Maps, Extensible Markup Language, CGI Scripts:**	**9L**
	1. Introduction of Editors, Elements, Attributes, Heading, Paragraph. Formatting, Link, Head, Table, List, Block, Layout, CSS. Form, Iframe, Colors, Colorname, Colorvalue.	3L
	2. Map, area, attributes of image area.	1L
	3. Introduction of Tree, Syntax, Elements, Attributes, Validation, Viewing. XHTML in brief.	4L
	4. Introduction, Environment Variable, GET and POST Methods.	1L
3	**PERL, JavaScript, Cookies, Java Applets:**	**10L**
	1. Introduction of Variable, Condition, Loop, Array, Implementing data structure, Hash, String, Regular Expression, File handling, I/O handling.	3L
	2. Basics, Statements, comments, variable, comparison, condition, switch, loop, break. Object – string, array, Boolean, reg-ex. Function, Errors, Validation.	4L
	3. Definition of cookies, Create and Store a cookie with example.	1L

	4.	Container Class, Components, Applet Life Cycle, Update method; Parameter passing applet, Applications.	2L
4	**Client-Server programming In Java, Threats,Network security techniques, Firewall:**		**4L**
	1.	A) Java Socket, Java RMI. 1. B) Malicious code-viruses, Trojan horses, worms; eavesdropping, spoofing, modification, denial of service attacks.	2L
	2.	A) Password and Authentication; VPN, IP Security, security in electronic transaction, Secure Socket Layer (SSL), Secure Shell (SSH). B) Introduction of Packet filtering, Stateful, Application layer, Proxy	2L
5	**Internet Telephony, Multimedia Applications, Search Engine and Web Crawler:**		**5L**
	1.	Introduction of VoIP.	1L
	2.	Multimedia over IP: RSVP, RTP, RTCP and RTSP. Streaming media, Codec and Plugins, IPTV.	2L
	3.	Definition, Meta data, Web Crawler, Indexing, Page rank, overview of SEO.	2L
Total Number Of Hours = 34			

Faculty In-Charge   HOD, CSE Dept.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Lecture-wise Plan

Subject Name: E-Commerce(IT) **Subject Code-BCA504A**
Year: 3rd Year **Semester: Fifth**

Module Number	Topics	Number of Lectures
1	**Introduction:**	**6L**
	1. Definition, Scope of E-Commerce, Hardware requirements.	2
	2. E-Commerce and Trade Cycle	1
	3. Electronic Markets	1
	4. Electronic Data Interchange and Internet Commerce	2
2	**Business to Business E-Commerce :**	**7L**
	1. Electronic Markets, Electronic Data Interchange (EDI): Technology, Standards (UN/EDIFACT),Communications, Implementations, Agreements, Security,	3
	2. 2. EDI and Business	2
	3. Inter-Organizational E-commerce.	2
3.	**Legal issues :**	**5L**
	1. Risks: Paper Document vs. Electronic document, Authentication of Electronic document, Laws.	2
	2. Legal issues for Internet Commerce : Trade marks and Domain names, Copyright, Jurisdiction issues, Service provider liability, Enforceable online contract.	3
4	**Security Issues :**	**6L**
	1. Security Solutions : Symmetric and Asymmetric Cryptosystems, RSA,DES ,and Digital Signature.	3
	2. Protocols for secure messaging	1
	3. Secure Electronic Transaction(SET) Protocol	1
	4. Electronic cash over internet, Internet Security.	1
5	**Business to Consumer E-Commerce :**	**8L**
	1. Consumer trade transaction.	2
	2. Internet	1
	3. Page on the Web.	1
	4. Elements of E-Commerce with VB,ASP	2
	5. SQL	2
6	**E-business :**	**7L**
	1. Internet book shops, Software supplies and support, Electronic Newspapers, Internet Banking.	2

	2. Virtual Auctions, Online Share Dealing, Gambling on the net	2
	3. E-Diversity	2
	4. Case studies through internet.	1
Total Number Of Hours = 39		

Faculty In-Charge   HOD, CSE Dept.

Assignment:

1. What is E-Commerce?
2. Short Notes: EDI, RSA,DES and Digital Signature.
3. Definition of B2B, B2C, C2B, C2C.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Lecture-wise Plan

Subject Name: Values and Ethics in Profession　　　　**Subject Code-HU501**
Year: 3rd Year　　　　　　　　　　　　　　　　**Semester: Fifth**

Module Number	Topics	Number of Lectures
	Introduction:	**19L**
1	Rapid Technological growth and depletion of resources, Reports of the Club of Rome. Limits of growth: Sustainable development	3
	Energy Crisis: Renewable Energy Resources Environmental degradation and pollution. Eco-friendly Technologies. Environmental Regulations, Environmental Ethics	5
	Appropriate Technology Movement of Schumacher; later developments Technology and developing notions. Problems of Technology transfer, Technology assessment impact analysis.	6
	Human Operator in Engineering projects and industries. Problems of man, machine, interaction, Impact of assembly line and automation. Human centered Technology.	5
	Ethics of Profession:	**9L**
2	Engineering profession: Ethical issues in Engineering practice, Conflicts between business demands and professional ideals.	3
	Social and ethical responsibilities of Technologists. Codes of professional ethics. Whistle blowing and beyond.	6
	Profession and Human Values	**8L**
3.	Values Crisis in contemporary society Nature of values: Value Spectrum of a good life	3
	Psychological values: Integrated personality; mental health Societal values: The modern search for a good society, justice, democracy, secularism, rule of law, values in Indian Constitution. Aesthetic values: Perception and enjoyment of beauty, simplicity, clarity Moral and ethical values: Nature of moral judgements; canons of ethics; ethics of virtue; ethics of duty; ethics of responsibility.	5

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Lab Manual

Title of Course: Unix & Networking
Course Code: BCA591
L-T-P scheme: 0-0-3   **Course Credit: 2**

Objectives:
This course introduces basic understanding of UNIX OS, UNIX commands and File system and to familiarize students with the Linux environment. To make student learn fundamentals of shell scripting and shell programming. Emphases are on making student familiar with UNIX environment and issues related to it..

Learning Outcomes:
 Upon completion of this course, the student will be able to:
1. You will be able to run various UNIX commands on a standard UNIX/LINUX Operating system (We will be using Ubuntu flavor of the Linux operating system).
2. You will be able to run C / C++ programs on UNIX.
3. You will be able to do shell programming on UNIX OS.
4. You will be able to understand and handle UNIX system calls.

Course Contents:
Exercises that must be done in this course are listed below:
Exercise No.1: Installation of Unix/Linux operating system.
Exercise No. 2: Write a C program to emulate the UNIX ls-l command.
Exercise No. 3: Write a C program to check the given integer is prime or not.
Exercise No. 4: Write a C program to display Largest of three numbers.
Exercise No. 5: Write a shell script program to display list of user currently logged in.
Exercise No. 6: Write a shell script program to display HELLO WORLD
Exercise No. 7: Write a shell script program to develop a scientific calculator
Exercise No. 8: Write a grep/egrep script to find the number of words character, words and lines in a file.
Exercise No. 9: Shell programming.
Exercise No. 10: Write a shell script program to display the process attributes.
Exercise No. 11: Write a shell script program to check variable attributes of file and processes.
Exercise No. 12: Installation of VirtualBox (VMWare) on a PC having other operating system.
Exercise No. 13: Shell Script program for changing process priority.

Text Book:
1. Maurice J. Bach, Design of the UNIX Operating System, PHI.

Recommended Systems/Software Requirements:
1. Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space.
2. Turbo C or TC3 complier in Windows XP or Linux Operating System.

Experiment No: 2

AIM:

Write a C program to emulate the Unix ls-l command.

Program:

```c
#include <stdio.h>

#include <unistd.h>

#include <sys/types.h>

#include <sys/wait.h>

#include <stdlib.h>

int main()

{

int pid;            //process id

pid = fork();     //create another process

if ( pid < 0 )

{                              //fail

printf("\nFork failed\n");

exit (-1);

}

else if ( pid == 0 )

{                    //child

execlp ( "/bin/ls", "ls", "-l", NULL );  //execute ls

}

else

{                            //parent

wait (NULL);           //wait for child

printf("\nchild complete\n");

exit (0);

}

}
```

Output:

guest-glcbIs@ubuntu:~$gcc –o lsc.out lsc.c

guest-glcbIs@ubuntu:~$./lsc.out

total 100

-rwxrwx—x 1 guest-glcbls guest-glcbls 140 2012-07-06 14:55 f1

drwxrwxr-x 4 guest-glcbls guest-glcbls 140 2012-07-06 14:40 dir1

child complete

Title of Course: Project Part-II **Course Code: BCA592**
L-T –P Scheme: 9P **Course Credits: 6**

Project: an activity where the participants have some degree of *choice* in the outcome. The result is complete and functional, that is, it has a beginning, middle and end. Usually, it spans multiple lab periods and requires work outside scheduled lab periods. Since there are choices in implementation, *design* is inherently a component of a project. A project is inherently different from an *analysis* or *exercise*, in which the solution has a predictable form. Projects span a wide variety of possibilities: design and build, identify a system, do a forensic analysis, evaluate a product or assess some environmental situation.

Program Objective 1
Graduates shall make their way to the society with proper scientific and technical knowledge in mechanical engineering.

Program Objective 2
Graduates shall work in design and analysis of mechanical systems with strong fundamentals and methods of synthesis.

Program Objective 3
Graduates shall adapt to the rapidly changing environment in the areas of mechanical engineering and scale new heights in their profession through lifelong learning.

Program Objective 4
Graduates shall excel in career by their ability to work and communicate effectively as a team member and/or leader to complete the task with minimal resources, meeting deadlines.

Program Outcomes:

1. Ability to apply knowledge of mathematics, science and mechanical engineering fundamentals for solving problems.
2. Ability to Identify, formulate and analyze mechanical engineering problems arriving at meaningful conclusions involving mathematical inferences.
3. Ability to design and develop mechanical components and processes to meet desired needs considering public health, safety, cultural, social, and environmental aspects.
4. Ability to understand and investigate complex mechanical engineering problems experimentally.
5. Ability to apply modern engineering tools, techniques and resources to solve complex mechanical engineering activities with an understanding of the limitations.
6. Ability to understand the effect of mechanical engineering solutions on legal, cultural, social, public health and safety aspects./li>

7. Ability to develop sustainable solutions and understand their impact on society and environment.
8. Ability to apply ethical principles to engineering practices and professional responsibilities.
9. Ability to function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
10. Ability to comprehend, design documentation, write effective reports, make effective presentations to the engineering community and society at large.
11. Ability to apply knowledge of engineering and management principles to lead teams and manage projects in multidisciplinary environments.
12. Ability to engage in independent and life-long learning in the broad context of technological changes and advancements.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Course Description

Title of Course: Seminar on Industrial Training   **Course Code: BCA593**
L-T –P Scheme: 0-0-3   **Course Credits: 2**

Course Description & Objectives:

1. **Understand** the history of medical research and bioethics related to the HeLa cells. Understand the diverse social and economic, racial and gender contexts within which Henrietta Lacks lived and died. Understand the themes of this seminar. Appreciate the legacy and implications of these medical, ethical and social understandings on today's society.

2. **Identify**, understand and discuss current, real-world issues.

3. **Distinguish** and **integrate** differing forms of knowledge and academic disciplinary approaches (e.g., humanities and sciences) with that of the student's own academic discipline (e.g., in agriculture, architecture, art, business, economics, education, engineering, natural resources, etc.). And apply a **multidisciplinary strategy** to address current, real-world **issues**.

4. Improve oral and written **communication** skills.

5. Explore an appreciation of the **self** in relation to its larger diverse social and academic contexts.

6. Apply principles of **ethics** and **respect** in interaction with others.

Course Outcomes:

After the completion of this course, the student should be able to:

1. **Learn and integrate.** *Through independent learning and collaborative study, attain, use, and develop knowledge in the arts, humanities, sciences, and social sciences, with disciplinary specialization and the ability to integrate information across disciplines.*

2. *Use multiple thinking strategies to* **examine real-world issues**, *explore creative avenues of expression*, **solve problems, and make consequential decisions**

3. **Learn and integrate.** Communicate**.** *Acquire, articulate, create and convey intended meaning using* **verbal** *and* **non-verbal method of communication** *that demonstrates respect and understanding in a complex society.*

4. *Use multiple thinking strategies to examine* **real-world issues**, **explore creative avenues of expression**, **solve problems, and make consequential decisions.**

5. **Clarify purpose and perspective.** *Explore* **one's life purpose and meaning** *through transformational experiences that foster an understanding of* **self**, **relationships**, *and* **diverse global perspectives**.

6. **ractice citizenship.** *Apply principles of **ethical** leadership, **collaborative engagement**, **socially responsible behavior**, **respect for diversity** in an interdependent world, and a service-oriented commitment to advance and sustain local and **global communities***.