UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Data Communication & Computer Networks
Course Code: BCA501
L-T Scheme: 3-1 **Course Credits:4**

Introduction:

This course is to provide students with an overview of the concepts and fundamentals of data communication and computer networks. Topics to be covered include: data communication concepts and techniques in a layered network architecture, communications switching and routing, types of communication, network congestion, network topologies, network configuration and management, network model components, layered network models (OSI reference model, TCP/IP networking architecture) and their protocols, various types of networks (LAN, MAN, WAN and Wireless networks) and their protocols. The course is supplemented by a practical component covered in CS692 concurrently.

Objectives:

At the end of the course, the students will be able to:

1. Build an understanding of the fundamental concepts of computer networking.
2. Familiarize the student with the basic taxonomy and terminology of the computer networking area.
3. Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
4. Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

Learning Outcomes:

After completing this course the student must demonstrate the knowledge and ability to:

1. Independently understand basic computer network technology.
2. Understand and explain Data Communications System and its components.
3. Identify the different types of network topologies and protocols.
4. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
5. Identify the different types of network devices and their functions within a network
6. Understand and building the skills of subnetting and routing mechanisms.
7. Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.
8. Analyze the features and operations of various application layer protocols such as Http, DNS, and SMTP.

Application:

1. To configure and implement network topology.
2. To configure and implement local area network.
3. To design network and assign IP address
4. Connect Remote computers
5. Analyze the network.

Course Contents:

Unit-1:

Introduction; Data communications: components, data representation (ASCII,ISO etc.),direction of data flow(simplex, half duplex, full duplex); Networks: distributed processing, network criteria, physical structure (type of connection, topology), categories of network (LAN, MAN,WAN);Internet: brief

history, internet today; Protocols and standards; Reference models: OSI reference model, TCP/IP reference model, their comparative study.

Physical layer:
Overview of data(analog & digital), signal(analog &digital), transmission (analog & digital)& transmission media (guided & non-guided); TDM, FDM, WDM; Circuit switching: time division & space division switch, TDM bus; Telephone network;

Unit-2:
Data link layer:
Types of errors, framing(character and bit stuffing), error detection & correction methods; Flow control; Protocols: Stop & wait ARQ, Go-Back- N ARQ, Selective repeat ARQ, HDLC;

Medium access sub layer:
Point to point protocol, LCP, NCP, FDDI, token bus,token ring; Reservation, polling, concentration; Multiple access protocols: Pure ALOHA, Slotted ALOHA, CSMA, CSMA/CD, FDMA, TDMA, CDMA; Traditional Ethernet, fast Ethernet;

Unit-3:
Network layer:
Internetworking & devices: Repeaters, Hubs, Bridges, Switches, Router, Gateway; Addressing : Internet address, classful address, subnetting; Routing : techniques,static vs. dynamic routing , routing table for classful address; Routing algorithms: shortest path algorithm, flooding, distance vector routing, link state routing; Protocols: ARP, RARP, IP, ICMP, IPV6; Unicast and multicast routing protocols.

Transport layer:
Process to process delivery; UDP; TCP; Congestion control algorithm: Leaky bucket algorithm, Token bucket algorithm, choke packets; Quality of service: techniques to improve QoS.

Unit-4:
Application layer:
DNS; SMTP, SNMP, FTP, HTTP & WWW; Security: Cryptography, user authentication, security protocols in internet, Firewalls.

Modern topics:
ISDN services & ATM ; DSL technology, Cable modem, SONET. Wireless LAN: IEEE 802.11; Introduction to blue-tooth, VLAN's, Cellular telephony & Satellite network.

Text Books:
1. B. A. Forouzan – "Data Communications and Networking (3rd Ed.) " – TMH
2. A. S. Tanenbaum – "Computer Networks (4th Ed.)" – Pearson Education/PHI
3. W. Stallings – "Data and Computer Communications (5th Ed.)" – PHI/ Pearson Education
4. Zheng & Akhtar, Network for Computer Scientists & Engineers, OUP
5. Black, Data & Computer Communication, PHI
6. Miller, data Communication & Network, Vikas

Reference Books:
1. Kurose and Rose – " Computer Networking -A top down approach featuring the internet" – Pearson Education
2. Leon, Garica, Widjaja – "Communication Networks" – TMH

3. Walrand – "Communication Networks" – TMH.
4. Comer – "Internetworking with TCP/IP, vol. 1, 2, 3(4th Ed.)" – Pearson Education/PHI

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: UNIX & Shell Programming
Course Code: BCA502
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

Batch process system programs, their components, operating characteristics, user services and limitations, implementation techniques for parallel, distributed and concurrent processing, interrupt handling, addressing techniques, file system design and management, system accounting, and other user-related services, traffic control, interprocess communication, remote procedure calls, design of system modules, and interfaces, system updating, documentation, and operation.

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:

Knowledge:

1. Be familiar with basic UNIX OS concepts such as: process, program, process groups, signals, running programs, process control, address space, user and kernel modes, system calls, and context switching.
2. Master in file I/O (i.e. open, close, read, write, seek)
3. Be familiar with using sockets to implement client-server environment.
4. Be familiar with using thread execution models (e.g. Posix threads).
5. Be familiar to handle signals and exceptions within a process and to control processes.
6. Be familiar with different approaches of concurrent programming.
7. Be familiar with different batch processing systems.
8. Be familiar with remote execution techniques.

Application:

1. Master in using the C/C++ programming language, its constructs and grammar, to create system software.
2. Master in the usage of makefiles, linking, object files, loading, symbol resolution, shared and static libraries, debugging, and execution of system programs.

Course Contents:

Unit 1: The UNIX Operating System, File system, General-purpose utilities
Unit 2: The Bourne Shell, Simple filters
Unit 3: Advanced Filters – I, Advanced Filters - II
Unit 4: Line editing with ex, Vi editor
Unit 5: The Process, communication and scheduling
Unit 6: Programming with the Shell
Unit 7: Introduction to System administration.

Text Books

1. UNIX-Concepts & Applications, Sumitava Das, TMH
2. Learning UNIX Operating System,Peek, SPD/O'REILLY
3. Understanding UNIX,Srirengan,PHI

Course Description

References

1. Learning the Vi Editor,Lamb, SPD/O'REILLY
2. Essentials Systems Administration,Frisch, SPD/O'REILLY

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Windows Programming
Course Code: BCA503
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

"Windows Programming" is programming that targets the Windows OS.The Windows API, informally WinAPI, is Microsoft's core set of applicationprogramming interfaces (APIs) available in the Microsoft Windows operating systems.

Objectives:

1. To understand Windows concepts and terminology
2. To explore the MFC programming concepts.

Learning Outcomes:

Knowledge:

After this course, the student will be able to
1. Implement and innovate commands using the basic tool kit.
2. Develop the practice of writing windows applications through OO concepts.

Course Contents:

Unit 1: Introduction to Windows Programming and Visual Basic:
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

Unit2: Visual Basic Forms and Controls:
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

Unit3: Visual Basic Programming:
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

Unit 4 : Visual Basic Advanced Features Creating a Database in VB – 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)

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Text Books:

Visual Basic 6 from ground up" by Garry Cornell, TMH, 1999.

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Course Description

Title of Course: Advanced Unix & Shell Programming
Course Code: BCA504A
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This course will prepare students to develop software in and for Linux/UNIX environments. Topics to be covered include basic operating system concepts, effective command line usage, shell programming, the C language, programming development tools, system programming, network programming.

Objectives:

To introduce the student to programming on Unix Systems. The student will learn the general issues of the Unix system and how to use them to build adequate and efficient programs. The student will learn how to program shell-scripts, how to program in C using all the facilities Unix can offer. Furthermore, the student will also learn to program network applications in a client/server way.

Learning Outcomes:
Knowledge:

1. To learn to develop software for Linux/UNIX systems.
2. To learn the C language and get experience programming in C.
3. To learn the important Linux/UNIX library functions and system calls.
4. To understand the inner workings of UNIX-like operating systems.
5. To obtain a foundation for an advanced course in operating systems.

Application:

1. Be able to transfer and apply programming approaches and techniques for solving specific problems using C and advanced Unix facilities.

Course Contents:

Unit 1: Organization of UNIX. User interface, Programmer interface.

Unit 2: The environment of UNIX process System calls. Process control, File related system calls. Process related system calls. Signals programming using system calls.

Unit 3: Advanced I/O multiplexing. Memory mapped I/O.

Unit 4: Interprocess communication: Pipes, shared memory, semaphores, messages. Advanced inter-process communications. Streams, Pipes, Open server.

Text Books

1. Your UNIX, The Ultimate Guide, Sumitava Das, TMH
2. Design of Unix Operating System,Bach,PHI

References

1. UNIX Programming Environment,Kernigham & Pike,PHI
2. Learning UNIX Operating System,Peek, SPD/O'REILLY
3. Learning the Vi Editor,Lamb, SPD/O'REILLY
4. Essentials Systems Administration,Frisch, SPD/O'REILLY

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Information Technology (IT)
Course Code: BCA504A
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This course involves study of the necessary theoretical foundations to design and develop stateof-the art web applications. Next to the technical aspects to develop applications for the web, business aspects are covered with the most common business models and explained with realworld examples.

Objectives:

The course will be supplemented by a separate Lab course in which the students learn how to design a good web site using the web technology tools (HTML, CSS, JavaScript, DHTML, XML and PHP). Technical aspects for the development of web applications are presented along with generic platforms and architectures. Students participating in the exercise apply this knowledge in individual projects that cover all aspects from the lecture/lab with the design and development of a web application. Students are strongly encouraged to participate actively in class discussions.

Learning Outcomes:

Knowledge:

1. You will broaden your knowledge of WWW ,Internet, HTTP, URL, DNS, Web browser, Web Server and FTP
2. You will become aware of the benefits and future of Web Applications
3. You will increase your proficiency in Scripting languages.
4. You will know the Web Architecture and how a Web client-server interaction happens.
5. You will Know the Website Development Process
6. You shall be exposed to various client side and server side technologies required to design web sites
7. You will know how a search engine and Meta search engine works and advantages and disadvantages of Meta search engine over a search engine.

Application:

1. The lab work and homework portions of the course are intended to help you apply your understanding,
2. To develop and implement client-side and server-side scripting language programs that meet stated specifications.
3. To develop and implement, and demonstrate Database Driven Websites through a project that meet stated specifications

Course Contents:

Unit 1: Overview, Network of Networks, Intranet, Extranet and Internet.

Unit 2: Introduction of Editors, Elements, Attributes, Heading, Paragraph. Formatting, Link, Head, Table, List, Block, Layout, CSS. Form, Iframe, Colors, Color name, Color value. Map, area, attributes of image area. Introduction of Tree, Syntax, Elements, Attributes, Validation, Viewing. XHTML in brief. Introduction of Environment Variable, GET and POST Methods.

Unit 3: Introduction of Variable, Condition, Loop, Array, Implementing data structure, Hash, String, Regular Expression, File handling, I/O handling. Basics, Statements, comments, variable, comparison, condition, switch, loop, break. Object – string, array, Boolean, reg-ex. Function, Errors, Validation.

Course Description

Definition of cookies, Create and Store a cookie with example. Container Class, Components, Applet Life Cycle, Update method; Parameter passing applet, Applications.

Unit 4: Java Socket, Java RMI. Malicious code-viruses, Trojan horses, worms. eavesdropping, spoofing, modification, denial of service attacks. Password and Authentication; VPN, IP Security, security in electronic transaction, Secure Socket Layer (SSL), Secure Shell (SSH). Introduction of Packet filtering, Stateful, Application layer, Proxy.

Unit 5: Introduction of VoIP. Multimedia over IP: RSVP, RTP, RTCP and RTSP. Streaming media, Codec and Plugins, IPTV. Definition, Meta data, Web Crawler, Indexing, Page rank, overview of SEO.

Text Books

1. Web Technology: A Developer's Perspective, N.P. Gopalan and J. Akilandeswari, PHI Learning, Delhi, 2013. (Chapters 1- 5,7,8,9).
2. Internetworking Technologies, An Engineering Perspective, Rahul Banerjee, PHI Learning, Delhi, 2011. (Chapters 5,6,12)

References

1. E. Balagurusamy – " Programming With Java: A Primer" – 3rd Ed. – , Tata Mc Graw Hill.
2. Herbert Schildt, Java: The Complete Reference (Tata Mcgraw Hill Education Private , 7th Ed).
3. Data Communications and Networking, Behrouz A. Forouzan, TMH
4. Data and Computer Communications, William Stallings, PHI

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: E-Commerce
Course Code: BCA504C
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This course examines E-Commerce concepts, and Business technique basics. The Topics to be covered (tentatively) include:

- Introduction
- Business to Business E-Commerce
- Legal issues
- Security Issues
- Business to Consumer E-Commerce
- E-business

Objectives:

In this course we will study the basic components of an E-Commerce, their functions, mechanisms, policies and techniques used in their implementation and examples from popular E-Commerce Application. The way different modules in the E-Commerce interact and work together to provide the basic services of an E-Commerce.

Learning Outcomes:

Knowledge:

1. Understand the theory and logic behind the design and construction of E-Business.
2. You will differentiate between various E-commerce functionalities in terms of performance.
3. Become aware of the issues in the management of resources like EDI,SET,RSA etc.
4. Know the problems in the design of E-Commerce and study the probable solutions.
5. Understanding various type of Business policies.
6. An overview of advanced E-Commerce and compare the technical aspects of all the advanced E-Commerce.

Application:

1. To develop, implement, and debug various VB & ASP.
2. To develop, implement, and demonstrate the algorithms of EDI.
4. To develop E-Business.

Course Contents:

Unit 1: Definition, Scope of E-Commerce, Hardware requirements, E-Commerce and Trade Cycle, Electronic Markets, Electronic Data Interchange and Internet Commerce.

Unit 2: Electronic Markets, Electronic Data Interchange (EDI): Technology, Standards (UN/EDIFACT), Communications, Implementations, Agreements, Security, EDI and Business, Inter-Organizational E-commerce.

Unit 3: Risks: Paper Document vs. Electronic document, Authentication of Electronic document, Laws, Legal issues for Internet Commerce: Trade marks and Domain names, Copyright, Jurisdiction issues, Service provider liability, Enforceable online contract.

Unit 4: Security Solutions: Symmetric and Asymmetric Cryptosystems, RSA, DES, and Digital Signature, Protocols for secure messaging, Secure Electronic Transaction(SET) Protocol, Electronic cash over internet, Internet Security .

Course Description

Unit 5: Consumer trade transaction, Internet, Page on the Web, Elements of E-Commerce with VB, ASP,SQL.

Unit 6: Internet book shops, Software supplies and support, Electronic Newspapers, Internet Banking, Virtual Auctions, Online Share Dealing, Gambling on the net, E-Diversity, Case studies through internet.

Text Books

1. E- Commerce-Strategy, Technologies & Applications by David Whitley, TMH.
2. Beginning E-Commerce with VB, ASP, SQL Server7.0 & MTS by Mathew Reynolds, Wrox Publishers.

References

1. E-Commerce-The cutting edge of business by Kamlesh K.Bajaj, TMH.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Values & Ethics in Profession
Course Code: HU501
L-T Scheme: 3L+1T **Course Credits: 3**

Introduction:

This course teaches students the basic principles of Values and Ethics within profession. These deals mainly with

- Values in professional life
- Ethics in professional life
- Resources depletion
- Conservation of resources for future generations
- Technology transfer
- Eco friendly Technology
- Value crisis in society
- Present society without values and Ethics.

Objectives:

This course relates to the present world and teaches students the need and importance of values and the problems faced by the present society in terms of depletion of natural resources and how to control the same for the sake of future generations.

Learning Outcomes:

Knowledge:

1. Understand the present scenario of degradation of values and Ethics system
2. Depletion of resources and how to conserve them.
3. Club Of Rome and what all stalwarts have thought to improve the situation
4. Sustainable Development.
5. Value spectrum of a good life
6. Present societal changes in terms of values and ethics
7. What steps to be taken to improve value system?
8. How to avoid conflicts to have a peaceful job life.
9.

Course Contents:

Unit 1: Rapid Technological growth and depletion of resources, Reports of the Club of Rome. Limits of growth: Sustainable development Energy Crisis: Renewable Energy Resources Environmental degradation and pollution. co-friendly Technologies. Environmental Regulations, Environmental Ethics Appropriate Technology Movement of Schumacher; later developments Technology and developing notions. Problems of Technology transfer, Technology assessment impact analysis. Human Operator in Engineering projects and industries. Problems of man, machine, interaction, Impact of assembly line and automation. Human centered Technology.

Unit 2: Engineering profession: Ethical issues in Engineering practice, Conflicts between business demands and professional ideals. Social and ethical responsibilities of Technologists. Codes of professional ethics. Whistle blowing and beyond.

Unit 3: Values Crisis in contemporary society Nature of values: Value Spectrum Of good life 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 judgments; canons of ethics; ethics of virtue; ethics of duty; ethics of responsibility.

Books:

AN Tripathi ,Human values in the Engineering Profession, Monograph published byIIM,Calcutta1996

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Unix & Shell Programming
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.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Minor Project **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>

Course Description

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****.*