UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Lecture-wise Plan

Subject Name: Advanced networking and Communication Subject Code-BCA601A
Year: 3rd Year Semester: SIX

Module Number	Topics	Number of Lectures
1	**Data Communication Fundamentals:**	**10L**
	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
2	**Data Link control:**	**6L**
	1. Interfacing to the media and synchronization; Error Detection and Correction; Flow and Error control; Data Link Control.	10
3	**Switching Communication Networks:**	**8L**
	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
4	**Broadcast communication networks:**	**10L**
	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
5	**Internetworking:**	**6L**
	1. Internetworking Devices; Internet Protocols; TCP/IP; Transport and Application layer protocols. Network Security: Cryptography; Secured Communication; Firewalls.	6
6	**Introduction to Mobile Computing:**	2L
	Introduction to Mobile technology (Topology, FDM, TDM, CDMA), Satellite Communication (LEO, GEO, TDM).	2
Total Number Of Hours = 41		

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?
4. Write down the names of network impairments?
5. Write down the features and basic components of a computer network
6. What kind of topology is well suited for university or college environment?
7. Why we need layered architecture?
8. What will be the channel capacity of a noisy channel having SNR value= 20dB and Bandwidth=3 KHz?

Module-2:

1. What is the significance of sequence number in Stop & Wait ARQ protocol?
2. Discuss Stop & Wait ARQ with 010101 bit sequence?
3. In Selective-Repeat ARQ, sender window size > 2m–1." Is it correct? Justify.
4. Suppose a sender is using sliding window protocol of window size 15. What will be the window status for the following occurrence? Sender has sent packets 0 to 11 and has received NAK 6.
5. Define ALOHA? Differentiate between Pure and Slotted ALOHA.

Module-3:

1. Differentiate between circuit switching and packet switching.
2. Write short notes on the following topic:
   A. Frame Relay
   B. X.25
   C. ATM
3. Why packet switching is connection less?

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?
4. Describe Bluetooth Architecture.
5. Differentiate between Token Ring and Token Bus

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. Compare IPv4 and IPv6
5. What is the purpose of subnetting? Find the netid and the host id of the following IP address
   A. 192.167.78.1
   B. 10.10.10.10
   C. 189.32.1.34
6. What is CIDR? Define NAT with proper example?

7. Write the differences between ARP and RARP?
8. Write the differences between TCP and UDP?
9. Differentiate Leaky Bucket Algorithm from Token Bucket Algorithm.
10. Why IP address is 32 Bit? How we need so many addresses? Compare IP address, Mac Address, Port address and Socket address?
11. Define Count to infinity problem? Which routing algorithm faces this problem?
12. Write the short notes on the following
    A. DNS
    B. FTP
    C. EMAIL
    D. MIME
    E. POP3
    F. SMTP
13. How are 'iterative query resolution and 'recursive query resolution different from each other in the context of DNS?
14. What do you understand by data privacy? How can authentication, integrity and non-repudiation be implemented by Digital Signature?
15. Define Firewall? Discuss all types of Firewall.

Module-6:

1. Define Mobile Computing? Write down the applications of Mobile computing?
2. Define Spread Spectrum? Discuss all the types of Spread Spectrum?
3. Compare and contrast between CDMA, TDMA?
4. Difference between Hidden and Exposed Terminal, Near and Far Terminals.
5. What are the multiplexing techniques (Space, Time, Frequency, Code division) and definition of each?

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Lecture-wise Plan

Subject Name: Artificial Intelligence Subject Code-BCA601B

Year: 3rd Year Semester: Sixth

Module Number	Topics	Number of Lectures
1	**Introduction:**	**2L**
	Overview of Artificial intelligence- Problems of AI, AI technique, Tic - Tac - Toe problem.	
2	**Intelligent Agents**	**2L**
	Agents & environment, nature of environment, structure of agents, goal based agents, utility based agents, learning agents.	
3	**Problem Solving**	**2L**
	Problems, Problem Space & search: Defining the problem as state space search, production system, problem characteristics, issues in the design of search programs.	
4	**Search techniques**	**5L**
	Solving problems by searching: problem solving agents, searching for solutions; uniform search strategies: breadth first search, depth first search, depth limited search, bidirectional search, comparing uniform search strategies.	
5	**Heuristic search strategies**	**5L**
	Greedy best-first search, A* search, memory bounded heuristic search: local search algorithms & optimization problems: Hill climbing search, simulated annealing search, local beam search, genetic algorithms; constraint satisfaction problems, local search for constraint satisfaction problems	
6	**Adversarial search**	**3L**
	Games, optimal decisions & strategies in games, the mini max search procedure, alpha-beta pruning, additional refinements, iterative deepening.	
7	**Knowledge & reasoning**	**3L**
	Knowledge representation issues, representation & mapping, approaches to knowledge representation, issues in knowledge representation.	

8	**Using predicate logic**	**2L**
	Representing simple fact in logic, representing instant & ISA relationship, computable functions & predicates, resolution, natural deduction.	
9	**Representing knowledge using rules**	**3L**
	Procedural verses declarative knowledge, logic programming, forward verses backward reasoning, matching, control knowledge.	
10	**Probabilistic reasoning**	**4L**
	Representing knowledge in an uncertain domain, the semantics of Bayesian networks, Dempster-Shafer theory, Fuzzy sets & fuzzy logics.	
11	**Planning**	2L
	Overview, components of a planning system, Goal stack planning, Hierarchical planning, other planning techniques.	
12	**Natural Language processing**	**2L**
	Introduction, Syntactic processing, semantic analysis, discourse & pragmatic processing.	
13	**Learning**	**2L**
	Forms of learning, inductive learning, learning decision trees, explanation based learning, learning using relevance information, neural net learning & genetic learning.	
14	**Expert Systems**	**2L**
	Representing and using domain knowledge, expert system shells, knowledge acquisition	
Total Number Of Hours = 39		

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UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Lecture-wise Plan

Subject Name: Artificial Intelligence Subject Code-BCA601B
Year: 3rd Year Semester: Sixth
Assignments:

Module-I: Introduction

1. What do you mean by Artificial intelligence?
2. Explain Tic - Tac - Toe problem.

Module-II: Intelligent Agents

1. Explain nature of environment
2. Discuss the followings:
    - structure of agents
    - goal based agents
    - utility based agents
    - Learning agents

Module-III: Problem Solving

1. Explain how the problem as state space search has defined?
2. Define problem characteristics and issues in the design of search programs.

Module-IV: Search techniques

1. What do you mean by problem solving agents? searching for solutions
2. Explain depth limited search, bidirectional search.

Module-V: Heuristic search strategies

1. Explain Greedy best-first search
2. How Hill climbing search and simulated annealing search are different from each other?

Module-VI: Adversarial search

1. What do you mean by optimal decisions & strategies in games?
2. Explain the mini max search procedure, alpha-beta pruning.

Module-VII: Knowledge & reasoning

1. Explain different knowledge representation issues, representation & mapping.
2. Mention different approaches to knowledge representation. What are the issues in knowledge representation?

Module-VIII: Using predicate logic

1. How you represent simple facts in logic?

2. Explain ISA relationship, computable functions & predicates.

Module-IX: Representing knowledge using rules

1. Differentiate Procedural and declarative knowledge
2. Explain logic programming. What are the differences between forward and backward reasoning?

Module-X: Probabilistic reasoning

1. How you represent knowledge in an uncertain domain?
2. Explain the semantics of Bayesian networks. What do you mean by Dempster-Shafer theory?

Module-XI: Planning

1. Explain the components of a planning system. What is Goal stack planning?
2. What do you mean by Hierarchical planning?

Module-XII: Natural Language processing

1. Explain Syntactic processing in NLP.
2. What do you mean by semantic analysis?

Module-XIII: Learning

1. Explain the different forms of learning. What do you mean by inductive learning, learning decision trees, explanation based learning?
2. Differentiate neural net learning & genetic learning.

Module-XIV: Expert Systems

1. How do you representing and use domain knowledge?
2. Explain expert system shells, knowledge acquisition.

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Lecture-wise Plan

Subject Name: Image Processing **Subject Code-BCA601C**
Year: 3rdYear, BCA **Semester: Sixth**

Module Number	Topics	Number of Lectures
1.	**Introduction:**	**4L**
	1. Background, Digital Image Representation,	1
	2. Fundamental steps in Image Processing	1
	3. Elements of Digital Image Processing – Image Acquisition, Storage, Processing, Communication, Display.	2
2.	**Digital Image Formation**	**6L**
	1. A Simple Image Model, Geometric Model- Basic Transformation (Translation, Scaling, Rotation),	3
	2. Perspective Projection,	1
	3. Sampling& Quantization - Uniform & Non-uniform	2
3.	**Mathematical Preliminaries**	**8L**
	1. Neighbour of pixels, Connectivity, Relations, Equivalence & Transitive Closure;	2
	2. Distance Measures, Arithmetic/Logic Operations, Fourier Transformation,	3
	3. Properties of The Two Dimensional Fourier Transform, Discrete Fourier Transform, Discrete Cosine & Sine Transform	3
4.	**Image Enhancement**	**10L**
	1. Spatial Domain Method, Frequency Domain Method, Contrast Enhancement –Linear& Nonlinear Stretching	3
	2. Histogram Processing; Smoothing - Image Averaging, Mean Filter, Low-pass Filtering; Image Sharpening. High-pass Filtering, High-boost Filtering	4
	3. Derivative Filtering, Homomorphic Filtering; Enhancement in the frequency domain - Low pass filtering, High pass filtering.	3
5.	**Image Restoration**	**6L**
	1. Degradation Model, Discrete Formulation, Algebraic Approach to Restoration – Unconstrained & Constrained	2
	2. Constrained Least Square Restoration, Restoration by Homomorphic Filtering,	2
	3. Geometric Transformation - Spatial Transformation, Gray Level Interpolation	2
6.	**Image Segmentation**	**8L**
	1. Point Detection, Line Detection, Edge detection, Combined detection, Edge Linking & Boundary Detection - Local Processing	3
	2. Global Processing via The Hough Transform; Thresholding - Foundation, Simple Global Thresholding, Optimal Thresholding	3
	3. Region Oriented Segmentation - Basic Formulation, Region Growing by Pixel Aggregation, Region Splitting & Merging	2
Total Number Of Hours = 42		

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Assignment :

Module -1 (Introduction)

Module -2 (Digital Image Formation)

Module -3 (Mathematical Preliminaries)

Module -4 (Image Enhancement)

Module -5 (Image Restoration)

Module -6 (Image Segmentation)

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Lecture-wise Plan

Subject Name: Software Engineering **Subject Code-BCA602A**
Year: 3rd Year **Semester: Sixth**

Module Number	Topics	Number of Lectures
1	**Software Engineering**	**6L**
	1. Objectives, Definitions	1
	2. Software Process models - Waterfall Model , Prototype model, RAD	3
	3. Evolutionary Models	1
	4. Incremental, Spiral.	1
2	**Software Project Planning**	**4L**
	1. Feasibility Analysis, Technical Feasibility	2
	2. Cost- Benefit Analysis,	1
	3. COCOMO model.	1
3.	**Structured Analysis**	**5L**
	1. Context diagram and DFD, Physical and Logical DFDs.	3
	2. Data Modelling, ER diagrams, Software Requirements Specification.	2
4	**Design Aspects**	**4L**
	1. Top-Down And Bottom-Up design; Decision tree, decision table and structured English	2
	2. Structure chart, Transform analysis Functional vs. Object- Oriented approach.	2
5	**Unified Modelling Language**	**6L**
	1. Class diagram, interaction diagram: state chart diagram,	2
	2. collaboration diagram, sequence diagram,	2
	3. Activity diagram, implementation diagram.	2
6	**Coding & Documentation**	**6L**
	1. Structured Programming, Modular Programming, Module Relationship- Coupling,	3
	2. Cohesion, OO Programming, Information Hiding, Reuse, System Documentation.	3
7	**Testing**	**4L**
	1. Levels of Testing	1
	2. Integration Testing	1
	3. System Testing.	1

8	**Software Quality**	**4L**
	1. Quality Assurance	1
	2. Software Maintenance	1
	3. Software Configuration Management	1
	4. Software Architecture, Computer Aided Software Engineering (CASE) tool	2
Total Number Of Hours = 39		

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Assignment:

Module-1(Software Engineering):

1. Explain Software Engineering as a layered technology with a neat sketch.
2. What are process models why do we require them? Explain in detail any one of the process model?
3. Why it is important to design a software and explain the role it play?

Module-2 (Software Project Planning):

1. What are the purposes of Data Flow diagrams, Entity-Relationship diagrams? Give an example diagram of each. (10 mks)

Module-3(Structured Analysis):

1. What is functional and non-functional requirements?
2. What is a requirement modeling? Explain about the types of requirement modeling
3. How can software project estimation be done by empirical estimation model

Module-4(Design Aspects):

1. How designing is done by functional based component design?

Module-5(Unified Modelling Language):

1. Give a brief description about class hierarchies and class based component design?

Module-6(Coding & Documentation):

Module-7(Testing):

1. What is user acceptance testing? Explain different testings in user acceptance testing. Why is it necessary?

Module-8(Software Quality):

1. Explain about the architecture of software and its importance?

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Lecture-wise Plan

Subject Name: Object Oriented Programming with Java **Subject Code- BCA602B**
Year: 3rd Year **Semester: Sixth**

Module Number	Topics	Number of Lectures
1	**Introduction:**	**6L**
	1. Concepts of object oriented programming language, Major and minor elements, Object, Class.	2
	2. Relationships among objects, aggregation, links.	2
	3. Relationships among classes association, aggregation, using, instantiation, meta-class, grouping constructs.	2
2	**Object oriented concepts:**	**3L**
	1. Difference between OOP and other conventional programming – advantages and disadvantages.	1
	2. Class, object, message passing, inheritance, encapsulation, polymorphism.	2
3.	**Class & Object proprieties:**	**11L**
	1. Basic concepts of java programming – advantages of java, byte-code & JVM.	2
	2. Data types, access specifiers, operators, control statements & loops, array, creation of class, object, constructor, finalize and garbage collection.	2
	3. Use of method overloading, this keyword, use of objects as parameter & methods returning objects, call by value & call by reference	2
	4. Static variables & methods, garbage collection, nested & inner classes	2
	5. Basic String handling concepts- String (discuss charAt() , compareTo(), equals(), equalsIgnoreCase(), indexOf(), length() , substring(), toCharArray() , toLowerCase(), toString(), toUpperCase() , trim() , valueOf() methods) & StringBuffer classes (discuss append(), capacity(), charAt(), delete(), deleteCharAt(), ensureCapacity(), getChars(), indexOf(), insert(), length(), setCharAt(), setLength(), substring(), toString() methods).	2
	6. Concept of mutable and immutable string, command line arguments, basics of I/O operations – keyboard input using BufferedReader & Scanner classes.	1
	Reusability properties	**4L**

4	1. Super class & subclasses including multilevel hierarchy, process of constructor calling in inheritance.	1
	2. Use of super and final keywords with super() method, dynamic method dispatch.	1
	3. Use of abstract classes & methods, interfaces.	1
	4. Creation of packages, importing packages, member access for packages.	1
5	**Exception handling & Multithreading**	**10L**
	1. Exception handling basics.	1
	2. Different types of exception classes, use of try & catch with throw, throws & finally, creation of user defined exception classes.	3
	3. Basics of multithreading, main thread, thread life cycle, creation of multiple threads, thread priorities.	3
	4. Thread synchronization, inter-thread communication, deadlocks for threads, suspending & resuming threads.	3
6	**Applet Programming (using swing)**	**7L**
	1. Basics of applet programming, applet life cycle, difference between application & applet programming	1
	2. Parameter passing in applets, I/O in applets, use of repaint(), getDocumentBase(), getCodeBase() methods.	1
	3. Concept of delegation event model and listener, layout manager (basic concept), creation of buttons (JButton class only) & text fields.	5

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Assignment:

Module-1(Introduction):

1. Explain different properties of object oriented programming language.

Module-2 (Object oriented concepts):

1. Advantages and disadvantages of java over C and C++.
2. Explain with examples: encapsulation, polymorphism.

Module-3(Class & Object proprieties):

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Lecture-wise Plan

1. Explain different steps of java source code compilation and execution.
2. Why java is called platform independent programming language.
3. Explain with examples different access specifiers of java.
4. Explain finalize and garbage collection of java.
5. Explain the significant of static keyword.
6. String vs StringBuffer class.

Module-4(Reusability properties):

1. Explain different inheritance with examples.
2. Explain uses of this, this(), super, super().
3. Abstract class vs interface.
4. Member access for packages.

Module-5(Exception handling & Multithreading):

1. Different ways of exception handling.
2. Different ways of implementing concept of multithreading.
3. Discus problems in multithreading and their solutions.

Module-3(Applet Programming (using swing)):

1. Benefits of applet.
2. Different programs with applet.
3. Different components of swing.
4. Different event handling and layouts in swing.

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Lecture-wise Plan

Subject Name: Advanced DBMS Subject Code-BCA602C
Year:3rd Year Semester: 6th

Module Number	Topics	Number of Lectures
1	**OVERVIEW OF STORAGE AND INDEXING, DISKS AND FILES**	**6L**
	1. Data on external storage; File. Organizations and indexing;	2
	2. Index data structures; Comparison of file organizations; Indexes and	2
	3. Performance tuning. Memory hierarchy; RAID; Disk space management;	1
	4. Buffer manager; Files of records; Page formats and record formats.	1
2	**TREE STRUCTURED INDEXING**	**4L**
	1. Intuition for tree indexes;	1
	2. Indexed sequential access method;	1
	3. B+ trees, Search, Insert, Delete, Duplicates,	1
	4. B+ trees in practice.	1
3	**HASH-BASED INDEXING**	**4L**
	1. Static hashing;	2
	2. Extendible hashing, linear hashing, comparisons.	2
4	**OVERVIEW OF QUERY EVALUATION, EXTERNAL SORTING:**	**8L**
	1. The system catalog; Introduction to operator evaluation; Algorithms for relational operations;	2
	2. Introduction to query optimization; Alternative plans: A motivating example;	2
	3. what a typical optimizer does. When does a DBMS sort data? A simple two-way merge sort;	2
	4. External merge sort	2
5	**EVALUATING RELATIONAL OPERATORS**	**6L**
	1. The Selection operation; General selection conditions; The Projection operation;	2
	2. The Join operation; The Set operations; Aggregate operations;	1
	3. The impact of buffering Concurrency control and recovery system: Lock based protocol, dead lock handling, time stamp based and validation based protocol, failure classification, storage, recovery algorithm,	2
	4. Recovery and atomicity, backup.	1

6	**A TYPICAL RELATIONAL QUERY OPTIMIZER:**	**4L**
	1. Translating SQL queries in to Relational Algebra; 2. Estimating the cost of a plan; Relational algebra equivalences; Enumeration of alternative plans; Nested subqueries; 3. Other approaches to query optimization.	1 2 1
7	**PHYSICAL DATABASE DESIGN AND TUNING**	**6L**
	1. Introduction; Guidelines for index selection, examples; 2. Clustering and indexing; Indexes that enable index-only plans; Tools to assist in index selection; 3. Overview of database tuning; Choices in tuning the conceptual schema; 4. Choices in tuning queries and views; Impact of concurrency; DBMS benchmarking.	1 2 2 1
8	**MORE RECENT APPLICATIONS**	**3L**
	1. Mobile databases; Multimedia databases; 2. Geographical Information Systems; Genome data management.	1 2
Total Number Of Hours = 41		

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Lecture-wise Plan

Subject Name: Advanced DBMS Subject Code-BCA602C
Year:3rd Year Semester: 6th

Assignment:

Module-I:

1. How do you organize file in a database?
2. What do you mean by RAID? What is indexing?

Module-II:

1. What do you mean by B+ trees
2. How do you Search, Insert, and Delete elements from B+ tree?

Module-III:

1. What do you mean by hashing? Explain Static hashing.
2. Differentiate Extendible hashing, linear hashing.

Module-IV:

1. How query optimization is done on database? Explain with proper example.
2. What a typical optimizer does in DBMS? When does a DBMS sort data? How two-way merge sort has done in DATABASE?

Module-V:

1. What is Lock based protocol? How dead lock is handled in DBMS?
2. Explain time stamp based and validation based protocol

Module-V:

1. How translation of SQL queries in to Relational Algebra is done? Explain with a example
2. What do you mean by Relational algebra equivalences?

Module-V:

1. Explain Clustering and indexing.
2. What do you mean by view and DBMS benchmarking.

Module-V:

1. What do you mean by mobile database?
2. Explain Geographical Information Systems and Genome data management.

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Course Description

Title of Course: Major Project **Course Code: BCA593**
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: BCA694**
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****.*

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Grand Viva **Course Code: BCA695**
L-T –P Scheme: 0P **Course Credits: 4**

Aims and Objectives

1. To compare the traditional viva examination (TVE) with OSVE (Objective Structured Viva Examination).

2. To obtain the students' opinion regarding OSVE as an assessment tool.

3. A suggestion to include OSVE as a part of university examination.

Materials and Methods

The study was carried out in November 2012, at K.J. Somaiya Medical College, in the department of Anatomy. 50 students were exposed to different stations of viva as well as OSVE. A comparison was made of the student's performance and a feedback was taken from the students regarding the same.

As the OSVE was being conducted for the first time, the students were notified in advance regarding the plan for conducting the part ending practical assessment – by both the TVE and OSVE. The OSVE was planned for 20 marks, viva voce of 20 marks.

Purpose and Format of the Viva Voce Examination

Literally, "viva voce" means by or with the living voice - i.e., by word of mouth as opposed to writing. So the viva examination is where you will give a verbal defence of your thesis.

Put simply, you should think of it as a verbal counterpart to your written thesis. Your thesis demonstrates your skill at presenting your research in writing. In the viva examination, you will demonstrate your ability to participate in academic discussion with research colleagues.

Purpose of the Exam

The purpose of the viva examination is to:

- demonstrate that the thesis is your own work
- confirm that you understand what you have written and can defend it verbally
- investigate your awareness of where your original work sits in relation to the wider research field
- establish whether the thesis is of sufficiently high standard to merit the award of the degree for which it is submitted

- allow you to clarify and develop the written thesis in response to the examiners' questions

The Examiners and Exam Chair

You will normally have two examiners:

- an internal examiner who will be a member of academic staff of the University, usually from your School/Department but not one of your supervisors
- an external examiner who will normally be a member of academic staff of another institution or occasionally a professional in another field with expertise in your area of research (candidates who are also members of University staff will normally have two external examiners in place of an internal and an external examiner)

Your supervisor should let you know who your examiners will be as it is important that you ensure you are familiar with their work and any particular approach that they may take when examining your thesis.

In some cases there may also be a Chair person for the examination. A Chair is appointed if the Graduate Dean or either of the examiners feels this is appropriate, for example where the examining team has relatively little experience of examining UK research degrees. The Chair is there to ensure the examination is conducted in line with University regulations and is not there to examine your thesis. If there is a Chair person, it will usually be a senior member of the academic staff of your School/Department.

Normally no one else is present in the exam.

Exam Venue and Arrangements

Your internal examiner is responsible for arranging your viva exam and they will contact you with the relevant details - date, time, venue, etc.

Usually the viva exam will take place in your School/Department, though occasionally another University location may be used. If you are unsure where you need to go, make sure you check this before the day of your exam.

If you returned your Notice of Intention to Submit Your Thesis three months before your submission date, your viva exam should normally take place quite soon after submission. Almost

all viva exams take place within three months of thesis submission and in many cases it is within one month.

Format of the Exam

All viva examinations are different, so it is not possible to describe exactly what will happen - but there are general points which can be made which may be helpful, and you should have the opportunity before your examination to discuss what will happen with your supervisor or to attend the University's pre-viva examination workshop.

The purpose of the viva is to establish that your work is of a sufficiently high standard to merit the award of the degree for which it is submitted. In order to be awarded a research degree, the thesis should demonstrate an original contribution to knowledge and contain work which is deemed worthy of publication.

In order to do this, examiners may:

- ask you to justify your arguments
- ask you to justify not only things which you have included in your thesis but also things which you may have left out
- ask you questions about the wider research context in which the work has been undertaken
- argue certain points with you
- expect you to discuss any developments which may flow from your work in the future

Inevitably, your thesis will have strengths and weaknesses and the examiners will want to discuss these. It is considered a positive thing, indeed an essential thing, that you can discuss both the strengths and the weaknesses. You can think of the weaknesses as an opportunity to demonstrate your skill at critical appraisal.

Remember that examiners seek to find and discuss weaknesses in all theses - you should not interpret criticism as an indication that the examination will not end successfully.