

# SEMESTER - VIII

## SEMESTER – VIII

### DIGITAL SIGNAL PROCESSING (EC(ID) – 8001)

Course Code	EC(ID) – 8001	Credits : 4	L-3, T-1, P-0
Name of the Course	DIGITAL SIGNAL PROCESSING		
Lectures to be delivered	<b>52 (1 Hr Each) (L = 39, T = 13 for each semester)</b>		
Semester	End	Max. Time: 3 hrs.	Max. Marks: 100
Examination			Min. Pass Marks: 40
<b>Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)</b>		<b>Max. Marks: 50</b>	

#### INSTRUCTIONS

- For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

#### SECTION – A

Discrete – time signal analysis and linear systems: Signal analysis – signal characteristics – typical discrete – time signals – operation on signals – properties of linear time – invariant digital systems – Fourier transform relationship – sampling analog signals and sampling rate conversion. Z-transform; Properties of Z-transform-inverse, Z-transform – analysis of discrete time systems, convolution

#### SECTION – B

System function, difference equation

IIR filter design: analog filter approximation, Butterworth, Chebyshev and elliptic filters, bilinear transformations, impulse invariance technique, digital frequency band transformations. FIR filter design: window technique, equiripple approximation technique, frequency sampling technique.

#### SECTION – C

Discrete Fourier transform (DFT) and inverse Discrete time Fourier Transform: properties – circular convolution. Fast Fourier Transform (FFT): Decimation-in-time (DIT) algorithm-decimation-in-frequency algorithm-FFT, Radix-2 DIT and DIF implementation.

## **SECTION – D**

Finite Register Length Effects: Quantization noise introduced by analog-to-digital conversion-finite register length effects in the realization of IIR and FIR digital filters and in DFT computation. IIR and FIR filter realization scheme

### **Text Books:**

1. *David.K.Defatta, Joseph G, Lucas and William S.Hodgkiss, Digital Signal Processing, John Wiley & sons, 1988.*
2. *Sanjit K and Mitra, Digital Signal Processing, Tata McGraw Hill, 1998.*

### **Reference Books:**

1. *A.V.Oppeheim and R.W.Schaffer, Digital Signal and Processing, Prentice Hall.*
2. *Farooq Hussain, Digital Signal and Processing, Prentice Hall.*

**SEMESTER – VIII**  
**WEB DEVELOPMENT(CS-8001)**

Course Code	<b>CS-8001</b>	Credits : 4	L-3, T-1, P-0
Name of the Course	<b>WEB DEVELOPMENT</b>		
Lectures to be delivered	<b>52 (1 Hr Each) (L = 39, T = 13 for each semester)</b>		
Semester End Examination	<b>Max. Time: 3 hrs.</b>	<b>Max. Marks: 100</b>	<b>Min. Pass Marks: 40</b>
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		<b>Max. Marks: 50</b>	

**Instructions**

- For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

**Section A**

**An overview of Java :** Object oriented programming ,Two paradigms, abstraction, the, OOP principles

Java class libraries

**Data types, variables and arrays :** Integers, floating point types, characters, Boolean, Iterates, Variable, Data types and casting, automatic type promotion in expressions arrays.

**Operators :** Arithmetic operators, bitwise operators, relational operators, Boolean logical assignment operators, the? Operator, operator precedence

**Control statements :** Java's selection statements, iteration statements, jump statements

**Introduction to classes :** Class fundamentals, declaring object reference variable, Introducing methods, constructors, the this key word, garbage collection, the finalize () method.

**Methods and Classes :** Overloading methods, using objects as parameters, recursion

**Section B**

**Inheritance :** Inheritance basics, using super, method overriding, dynamic method dispatch, using abstract Classes, Using final with inheritance

Package and Interfaces ,Package access protection, importing packages

**Exception handling :** Exception handling fundamentals., Exception types, Uncaught Exceptions Using try and catch, multiple catch clauses, nested try statements throw, finally Java built in exception creating your own exception sub classes, using exceptions.

**Multithreaded Programming**

The Java thread model, the main thread, creating thread, creating multiple thread, using is alive() and join ().

Thread priorities, synchronization, Inter thread communications, suspending resuming and stopping thread using multithreading

**String handling**

The string constructor, string length, special string operator character extraction, string comparison, searching string, modifying string, data conversion, changing the case of characters, string buffer.

**Abstract windowing Toolkit :** Introduction to Applets, definition, steps to create applets, applet tags, parameter passing, major applet activities.

**Section C**

**HTML :** Tags, Formatting text, hyperlinks and color in web pages creating tables and frames. Working with images, maps and forms.

**Scripting Languages :-** JavaScript- Using Operators, statements, function, handling events and working with objects. Creating frames, Processing forms, using hidden fields and cookies. Working with links and images.

**Section D**

**Active Server Pages (ASP) :-** ASP basic architecture, Request Object, response Object, application Object, Session Object, Server Object Database Access in ASP.

**XML :-** Creating an XML document, Using element, declaration and examination attribute declarations, using XML in an HTML document, XML on the web.

**Text books & References :**

1. Java 2 Complete Reference (Tata McGraw Hill)
2. Core Java-I (Addison Wesley) - horstmann
3. Core Java - II (Addison Wesley)
4. Thinking in Java (Bruce Eckel)
5. HTML 4 By QUE
6. Active Server pages 3 Developers Guide- Alberto Manuel Ricart, Stephen Asbury, DIG Books India.
7. Teach Yourself HTML 4 With XML, DHTML and Java Script - Stephine Cottrell Bryant

**SEMESTER – VIII**  
**DIGITAL SIGNAL PROCESSING LAB (EC(ID) – 8005)**

Course Code	<b>EC(ID) – 8005</b>	Credits :3	L-0, T-0, P-3
Name of the Course	<b>DIGITAL SIGNAL PROCESSING LAB</b>		
Lectures to be delivered	<b>39 hours of Lab sessions</b>		
Semester End Examination	<b>Max. Time = 3 hrs.</b>	<b>Max. Marks : 50</b>	<b>Min. Pass Marks: 20</b>
Laboratory <b>Continuous Assessment</b>	<b>Based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%</b>	<b>Max. Marks: 50</b>	<b>Min. Pass Marks: 25</b>

**Instructions for paper setter/Candidates**

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner (25 marks).
2. Viva-voice examination (25 marks).

Viva-voice examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

**LIST OF EXPERIMENTS : -**

Perform the experiments lab using DSP:

1. To represent basic signals (Unit step, unit impulse, ramp, exponential, sine and cosine)
2. To develop program for discrete convolution.
3. To develop program for discrete correlation.
4. To understand stability test.
5. To understand sampling theorem.
6. To design analog filter (low-pass, band-pass, band-stop).
7. To design digital IIR filters (low-pass, high pass, band-pass, band-stop )
8. To design FIR filter using windows technique.
9. To design a program to compare direct realization values of IIR digital filter.
10. To develop a program for computing parallel realization values of IIR digital filter.
11. To develop a program for computing cascade realization values of IIR digital filter.
12. To develop a program for computing inverse Z-transform of a rational transfer function

**SEMESTER – VIII**  
**MAJOR PROJECT (CS – 8004)**

Course Code	CS – 8004	Credits : 8	L-0, T-0, P-8
Name of the Course	MAJOR PROJECT		
Project evaluation	Max. Time = 3 hrs.	Max. Marks: 150	Min. Pass Marks: 40%
Laboratory Continuous Assessment	On the basis of continuous review project report and viva voce	Max. Marks: 150	Min. Pass Marks: 50%

**Instructions for paper setter/Candidates**

Laboratory examination will consist of two parts:

- i) Performing a practical examination assigned by the examiner (25 marks).
- ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

Project is one of the culmination points of the learning process, which puts to test the acquired ability of the candidate of independently take charge of project or system development. The effort should be made to open up a window of opportunity with the industry, the project can proceed in three steps using software engineering methodology. Preparation of requirement document

1. Preparation of Design Document.
2. Writing of Code its testing with demonstration cases.
3. An effort should be made by the institute faculty to liaison with the industry and conduct three reviews to meet the dead lines and satisfactory completion of the project.

The student can be given in campus live project to meet the needs of institution as well as providing training to meet the aims of the course.

Following format for documentation for the project be followed:

A. Forwarding Page

1. Title of the project
2. Objectives
3. Definitions of Key Term
  - Approach to Problem solving
  - Limitations. If any
4. Output Generated
5. Details of Hardware Performed
6. Details of Software Tools used
7. Implementation issues(clearly defining the area of application)
8. Miscellaneous
9. Signature of candidate & date

B. Recommended Chapters/sections(Not Mandatory but only Guidelines)

1. Microscope Summery
2. Details of candidate and supervisor along with certificate of
  - Original work;
  - Assistance, if any;
  - Credits;
3. Aims and Objectives
4. Approaches to Project and Time Frame
5. Project Design Description with appendices to cover
  - Flow charts/Data Flow Diagram – Macro/Micro Level
  - Source code, If any
  - Hardware plateform
  - Software Tools
  - Security Measures
  - Quality Assurance
  - Auditability
6. Test Date and Result

**SEMESTER – VIII**  
**CORE JAVA AND WEB DEVELOPMENT LAB(CS – 8006)**

Course Code	<b>CS – 8006</b>	Credits :2	L-0, T-0, P-2
Name of the Course	<b>CORE JAVA AND WEB DEVELOPMENT LAB</b>		
Lectures to be delivered	<b>26 hours of Lab sessions</b>		
Semester End Examination	<b>Max. Time = 3 hrs.</b>	<b>Max. Marks : 50</b>	<b>Min. Pass Marks: 20</b>
Laboratory <b>Continuous Assessment</b>	<b>Based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%</b>	<b>Max. Marks: 50</b>	<b>Min. Pass Marks: 25</b>

**Instructions for paper setter/Candidates**

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner (25 marks).
2. Viva-voice examination (25 marks).

Viva-voice examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

**LIST OF EXPERIMENTS : -**

1. Write a program to determine the sum of the following Harmonic series for n=8:  
 $1 + 1/2 + 1/3 + \dots + 1/n$
2. Write a program to read the price of an item in decimal form (like 75.95) and print the output in paise (like 7595).
3. Write a program to convert the given temperature in fahrenheit to celsius using the following conversion formula  
 $C = (F - 32) / 1.8$   
 And display the result in tabular form
4. Write a program to find the even and odd numbers from 1 to 50.
5. Write a program to print the following pattern:  

```

1
2   2
3   3   3
4   4   4   4
5   5   5   5   5

```
6. Write a program to find the factorial of a given no.
7. Write a program to print the fibonacci series  
 $0, 1, 1, 2, 3, 5, 8, \dots, n$  for any given value of n
8. Write a program using switch statement to print the following grade according to the percentage of the student

GRADE

Honours  
 First division  
 Second division  
 Third division  
 Fail

PERCENTAGE

above 75%  
 60% - 75%  
 50% - 60%  
 40% - 50%  
 less than 40%

9. Write a program to compute the sum of the digits of a given integer no.
10. Design a Class to represent a bank account. Include the following details

Data Members:

1. Name of the depositor
2. Account number
3. Type of Account
4. Balance amount in account

Methods:

1. To assign initial values
2. To deposit an amount
3. To withdraw an amount after checking the balance
4. To display the name and balance



**SEMESTER – VIII**  
**Web Technology Lab (CS-8007)**

Course Code	<b>CS-8007</b>	Credits : 2	L-0, T-0, P-2
Name of the Course	<b>Web Technology Lab</b>		
Lectures to be delivered	<b>26 hours of Lab sessions</b>		
Semester Examination	<b>Max. Time = 3 hrs.</b>	<b>Max. Marks : 50</b>	<b>Min. Pass Marks: 20</b>
Laboratory	<b>Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)</b>	<b>Max. Marks: 50</b>	<b>Min. Pass Marks: 25</b>

**Instructions for paper setter/Candidates**

Laboratory examination will consist of two parts:

- i. Performing a practical examination assigned by the examiner (25 marks).
- ii. Viva-voce examination (25 marks).

Viva-voce examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments:

- 1) Develop a home page giving description of your institute using various HTML tags.
- 2) a) Create a **Web** page which opens three new browser windows displaying blank documents. It then asks the user (through a prompt window) to enter a message. Following that, it asks the user for an integer number between 1 and 3. Your program should display the message the user typed on the window the user specified. For instance, if the user entered in the first prompt window the message "Hello world" and in the second prompt window he / she entered the number "2" then your program should display the phrase "Hello world" on the second window.  
b) Extend your program such that if the user fails to enter an integer number between 1 and 3 then an error message is displayed in an alert window. Then, the prompt window is re- displayed asking the user to re-enter a number between 1 and 3.
- 3 ) (Frame Messenger) Repeat **experiment 2** this time using frames (instead of windows).  
**4)** (Form Navigator) Create a **Web** page which splits the browser window into two frames with sizes of your choice. The top frame has a text area and a button labeled "discover". The bottom frame contains an HTML form with a few elements such as text fields, text areas, checkboxes, radio buttons, etc, of your choice. The form should have at least *5 elements*. Write a JavaScript function to be included in the HTML page displayed in the top frame which should be activated once the user presses the button "discover". The function should "scan" the HTML
- 5) Create a **web** page which asks the user to enter two numbers (floats). Your **web** page also provides four buttons with the labels *add, subtract, multiply* and *divide*. When the user presses one of the buttons, your JavaScript program should perform the appropriate calculation and display the result on an alert window. So for example if the user enters the numbers 100 and 200 and presses the button *Subtract* then the new alert window should display the value -100.  
b) Extend you program such that if the user presses one of the four buttons without having entered any numbers yet then an alert window is displayed with the message "Sorry, you have to enter two numbers before pressing this button".
- c) It is well known that dividing by zero does not make sense. Extend your program such that the user is warned over a division by zero.
- 6) ( Maximum Number ) a) Create a **web** page which asks the user to enter an integer *n* representing the number of numbers he / she wishes to enter. So if the user enters the number 10 this means she / he

wishes to enter 10 distinct numbers. Your program should then display a prompt window  $n$  times, sequentially, to ask the user to type in his / her numbers, one at a time. Your JavaScript program should calculate the maximum of these numbers and display it on an alert window.

b) Extend your program such that it not only discovers the maximum but also calculates the total sum of the numbers entered

7) Write an ASP script that sends to the browser the form shown below (in which the user can specify a number  $n$ ), and a table displaying the first  $n$  integers (starting at 1) along with the square root of each. You may need to use some VBScript functions, like `isNumeric()`, `Int()` and `Sqr()`:

8) Develop a login page to authenticate a user :

<b>Login</b>	
User ID:	<input type="text"/>
Password:	<input type="text"/>
<input type="button" value="New"/>	<input type="button" value="OK"/> <input type="button" value="Cancel"/>

9) Develop a web page that display the profile of a member user. Profile is to be stored & retrieved from database.

10) Using web technologies learned so far Develop your own website of your branch

# **Department Elective -II**

**SEMESTER – VIII**  
**DIGITAL IMAGE PROCESSING ( CS-8008)**

Course Code	<b>CS-8008</b>	Credits : 4	L-3, T-1, P-0
Name of the Course	<b>Digital Image Processing</b>		
Lectures to be delivered	<b>52 (1 Hr Each) (L = 39, T = 13 for each semester)</b>		
Semester	End	<b>Max. Time: 3 hrs.</b>	<b>Max. Marks: 100</b>
Examination			<b>Min. Pass Marks: 40</b>
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		<b>Max. Marks: 50</b>	

**Instructions**

- For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section-A

Introduction: Introduction to Image Processing; Elements of image processing systems; Image representation and modeling.  
Digital Image Fundamentals: An Image model; Sampling and Quantization; Some basic relationships and pixels; Camera model; Camera calibration; Electrographic projections; Elementary idea of photographic films.

Section-B

Image Transforms: Introduction to Fourier transforms; The discrete Fourier transform; Some properties of the 2 - D Fourier transform; The Fast Fourier Transform; Other separate Image transforms – Walsh and Haugh. Image Enhancements Background; Special domain method; Frequency - domain methods; Image enhancement by histogram; Modification technique; image smoothing; Neighborhood averaging; Median filtering; Low pass filtering; Image sharpening; Sharpening by differentiation High pass filtering; Pseudo color image processing-color fundamentals; Density swing; Grey - level to color transformations.

Section-C

IMAGE RESTORATION: Degradation model; Some definitions; Degradation model for continuous Functions; Discrete formulations; Diagonalisation of circlet and Mock circlet Matrices ; Effects of diagonalisation on the degradation model.

Section-D

IMAGE ENCODING: Fidelity criteria; The encoding process 8.  
IMAGE SEGMENTATION: The detection of discontinuities; Point detection; Line detection; Edge detection, Edge - linking and boundary detection; Thresholding – foundation, the role of elimination; A global thresholding technique.

Text Books:

- Gonzalez Rafael.C & Wintz Paul : DIGITAL IMAGE PROCESSING; Addison- Wesley.
- Jain Anil K: FUNDAMENTALS DIGITAL IMAGE PROCESSING; Prentice Hall

References:

- Jensen, J.R. :INTRODUCTION TO DIGITAL IMAGE PROCESSING; Prentice Hall
- Pratt William K: DIGITAL IMAGE PROCESSING; John Wiley and Sons
- Rosenfield Azriel, Kak Avinash C: DIGITALPICTURE PROCESSING; Academic Press Inc.

SEMESTER – VIII  
**SOFTWARE MAINTENANCE(IT – 8016)**

Course Code	<b>IT – 8016</b>	Credits: 4	L-3, T-1, P-0
Name of the Course	<b>SOFTWARE MAINTENANCE</b>		
Lectures to be delivered	<b>52 (1 Hr Each) (L = 39, T = 13 for each semester)</b>		
Semester End Examination	<b>Max. Time: 3 hrs.</b>	<b>Max. Marks: 100</b>	<b>Min. Pass Marks: 40</b>
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	<b>Max. Marks: 50</b>		

**Instructions:-**

- 1. For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- 2. For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

**SECTION – A**

**Fundamentals:** Meaning of software maintenance, software change, ongoing support, economic implications of modifying software, the nomenclature and image problem, software maintenance framework, potential solutions to maintenance problem.

**Maintenance process models:** Definitions, critical appraisal of traditional process models, maintenance process models.

**Program understanding:** Aims of program comprehension, maintainers and their information needs comprehension process models, mental models, program comprehension strategies, factors that affect understanding, implications of comprehension theories and studies.

**SECTION – B**

**Reverse Engineering:** Definitions, purposes and objectives, levels of reverse Engineering, supporting techniques, benefits.

**Reuse and reusability:** Definitions, objective and benefit of reuse, approach to reuse, domain ANALYSIS, COMPONENTS Engineering, reuse process model, factors that impact upon reuse.

Maintenance measures, Definitions, objectives of software measurement, example measures, guidelines for selecting maintenance measures.

**SECTION – C**

**Configuration management:** Definitions, configuration management, change control, documentation.

Management and organizational issues, Management responsibilities, enhancing maintenance productivity, maintenance teams, personnel education and training, organization modes.

**SECTION – D**

**Building and sustaining maintainability:** Quality assurance, fourth generation languages, object oriented paradigms.

**Maintenance tools:** Criteria for selecting tools, **taxonomy** of tools, program understanding and reverse engineering testing, configuration management, and other tasks. Past present and future of software maintenance.

**Books:**

1. Software Maintenance: concepts and Practice, Armstrong A Takang and Penny A.Grubb, International Thomson Computer press, London.

**SEMESTER – VIII**  
**OPTICAL COMMUNICATION (EC-8013)**

Course Code	<b>EC-8013</b>	Credits : 4	L-3, T-1, P-0
Name of the Course	<b>OPTICAL COMMUNICATION</b>		
Lectures to be delivered	<b>52 (1 Hr Each) (L = 39, T = 13 for each semester)</b>		
Semester Examination	End	Max. Time: 3 hrs.	Max. Marks: 100
			<b>Min. Marks: 40</b>
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		<b>Max. Marks: 50</b>	
			<b>Pass</b>

**Instructions**

- For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

**SECTION – A**

Need for Fiber Optic Communications System, Role of Fiber Optic communication technology, Basic Block Diagram, Advantages & Disadvantages of Optical Fiber Communication, Ray Theory, Electromagnetic Mode Theory, Step Index Fiber, Graded Index Fiber, Attenuation- Bending Losses, Scattering, Absorption, Dispersion – Intermodal, Chromatic, limitations & remedies.

**SECTION – B**

Light sources & Transmitters – Light Emitting Diodes, laser diodes, Principle of action, characteristics, efficiency, Block Diagram and typical circuits of Transmitter.

**SECTION – C**

Receivers, Photodiodes - Working, Power relationship, PIN photodiodes, Avalanche photodiode, Block Diagram & typical circuits of receiver.

**SECTION – D**

Fiber Cable Connectorization– Splicing, Connectors, components of Fiber Optic Networks, Tranceivers, Semiconductor, optical amplifiers - Principle of operation, Gain, Bandwidth, Crosstalk, Noise, Applications, Advantages& Disadvantages. Erbium Doped Fiber Amplifiers(EDFAs) - Operation, gain, noise, Components of EDFA module

**Books Recommended:**

- Fiber Optic Comm. Systems – D.K.Mynbaev Pearson Education.
- Optical Fiber Comm. Principle – John M.Senior PHI Pub.
- Optical Fiber Comm. Principle – G.Keiser.

**SEMESTER – VIII**  
**CELLULAR AND SATELLITE COMMUNICATION(EC(ID) – 8014)**

Course Code	<b>EC (ID)– 8014</b>	Credits : 4	<b>L-3, T-1, P-0</b>
Name of the Course	<b>CELLULAR AND SATELLITE COMMUNICATION</b>		
Lectures to be delivered	<b>52 (1 Hr Each) (L = 39, T = 13 for each semester)</b>		
Semester Examination	<b>Max. Time: 3 hrs.</b>	<b>Max. Marks: 100</b>	<b>Min. Pass Marks: 40</b>
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		<b>Max. Marks: 50</b>	

**Instructions**

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

**SECTION – A**

Mobile Telephone Service, Evolution of cellular Telephone, Fundamental Concepts of Cellular Telephone, Fundamental Concepts of Cellular Telephone, Frequency Reuse, Interference, segmentation & Dualization, Cellular System Topology, Roving & Handoffs, Cellular Telephone network Components, Cellular Cell processing.

**SECTION- B**

First Generation Analog Cellular Telephone, Second Generation Analog Cellular telephone, Personal Comm. Systems, digital Cellular telephone, CDMA Cellular Radio network, Global Systems for Mobile communication.

**SECTION – C**

Principle of Satellite Comm., Kepler's law, Geosynchronous Satellite, Antenna look angles, Satellite classifications spacing and Frequency allocation, Satellite antenna Radiation patterns, Footprints, Satellite link models, Parameter & Equations.

**SECTION – D**

FDM/FM Satellite Systems, Multiple accessing – FDMA, TDMA, CDMA, Channel Capacity Special purpose Comm. Satellites, INTELSAT, VSAT (data broad – band Satellite), MSAT. LEOs (lower Earth Orbit Satellite), Defence Satellites.

**Reference books:**

1. Advanced Electronic Communications Systems: Wayne Tomasi.
2. Electronic Communications: Dennis Roddy & John Coolen.

# **OPEN ELECTIVE**



**Semester-VIII**  
**COMMUNICATION SYSTEMS (EC – 8020)**

Course Code	EC – 8020	Credits : 4	L-3, T-1, P-0
Name of the Course	COMMUNICATION SYSTEMS		
Lectures to be delivered	52 (1 Hr Each) (L = 39, T = 13 for each semester)		
Semester Examination	Max. Time: 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		Max. Marks: 50	

**Instructions**

- For Paper Setters: The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- For candidates: Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

**SECTION – A**

**PULSE COMMUNICATION:** Information In a communication system, coding, noise in an information carrying channel, Types of pulse modulation, Pulse Amplitude modulation (PAM), Pulse Width Modulation (PWM), Pulse Position Modulation (PPM), Pulse code Modulation (PCM), Telegraphy (& Telex), Telemetry.

**SECTION – B**

**BROADBAND COMMUNICATION SYSTEMS:** Frequency division multiplexing, Time division multiplexing, Short & Medium Haul systems – Coaxial Cables, Fiber Optic Links, Microwave Links, Tropospheric scatter links, Long Haul Systems – Submarine cables, Satellite communications.

**SECTION – C**

**SATELLITE COMMUNICATION:** Introduction, Orbits, Station keeping, Orientation of Satellite, Transmission Path, It's losses & noise consideration, Satellite Systems, Saturation flux Density, effective Isotropic radiated Power, SPADE, TDMA.

**SECTION – D**

**FIBER OPTIC COMMUNICATION:** Introduction, Principle of light transmission in a fiber, Effect of Index profile on Propagation, Modes Of propagation, Number of modes via fiber, Single mode propagation, Rayleigh scattering losses, Absorption losses, mode coupling losses, bending losses, combined losses. Effects of Dispersion on Pulse Transmission, intermodal dispersion, material dispersion, waveguide dispersion, total dispersion, fiber optic communication system.

**BOOKS:**

- Electronics communication systems by Kennedy & Davis, TMH.
- Electronics Communication by Dennis Roddy & John Coolen.

**Semester-VIII**  
**RELIABILITY OF ELECTRONICS COMMUNICATION SYSTEM (EC-8021)**

Course Code	<b>EC-8021</b>	Credits-4	<b>L-3, T-1, P-0</b>
Name of the Course	<b>Reliability Of Electronics Communication System</b>		
Lectures to be Delivered	<b>52 (1 Hr Each) (L=39, T=13 for each semester)</b>		
Semester End Examination	<b>Max Marks: 100</b>	<b>Min Pass Marks: 40</b>	<b>Maximum Time: 3 hrs</b>
Continuous Assessment (based on sessional test (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			<b>Max Marks: 50</b>

**Instructions**

- For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

**Section A**

Basic Definitions, concept and need for reliability, inherent value of reliability in modern system, hazard rate, failure density function, mean time to failure & repair. Relationship between basic variables, analytical form of reliability function. Derivation for the exponential distribution function and Weibull distribution.

**Section B**

Different type and modes of failures, causes of failure in different systems, systems structures, series, parallel, stand by, K-out-of-n configuration their reliability analysis. Reliability evaluation techniques applicable to general non-series parallel system. Markov processes for repairable & no repairable system & their applications in reliability analysis..

**Section C**

Maintainability, analysis of down time, Repair Time Distribution, Stochastic Point Processes, System Repair Time, Reliability under Preventive Maintenance, State Dependent Systems With Repair Maintenance Requirements. Availability, concepts & definitions, Exponential Availability model, System availability, Inspection & Repair availability model, design trade-off Analysis.

**Section D**

Data collection & Empirical Methods- Data collection, Empirical methods, static life estimation. Reliability Testing- Product testing, Reliability Life testing, Test time calculations, Burn in testing, Acceptance testing, accelerated life testing, experimental design, Competing failure models.

**Books:**

- Concepts in Reliability by L.S. Sri Nath.
- Reliability Engineering by Balaguruswamy :
- Reliability and Maintainability Engineering by Charles E. Ebeling.

**Semester-VIII**  
**Computer Based Measurement And Control (EC-8001)**

Course Code	EC-8001	Credits-4	L-3, T-1, P-0
Name of the Course	Computer Based Measurement And Control		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

**Instructions**

- For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

(TITLE APPROVED CONTENTS TO BE DECIDED LATER)

**SEMESTER – VIII**  
**NON CONVENTIONAL ELECTRICAL POWER GENERATION(EE-8008)**

Course Code	<b>EE-8008</b>	Credits : 4	L-3, T-1, P-0
Name of the Course	<b>NON CONVENTIONAL ELECTRICAL POWER GENERATION</b>		
Lectures to be delivered	<b>52 (1 Hr Each) (L = 39, T = 13 for each semester)</b>		
Semester End Examination	<b>Max. Time: 3 hrs.</b>	<b>Max. Marks: 100</b>	<b>Min. Pass Marks: 40</b>
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	<b>Max. Marks: 50</b>		

**Instructions:-**

- For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

**SECTION – A**

**Energy situation and renewable energy sources:** Global Energy scenario, World Energy consumption, Energy in developing countries, fire wood crisis, Indian energy scene, Non conventional renewable energy sources, potential of renewable energy sources.

**SECTION – B**

**Wind Energy:** Origin of wind, Basic principle of wind energy, conversion, component of wind energy conversion system, type of windmills, Wind electrical Generations in India.

**Solar Energy:** Introduction, solar radiation, solar energy collector, solar thermal power generation, low temperature application of solar energy.

**SECTION - C**

**Geo-thermal Power Plants:** Introduction, Geothermal sources, comparison of Geo thermal energy with other energy forms, development of Geothermal power in India.

**Physical and thermochemical methods of bioconversion:** Introduction, biomass definition and potential, physical method of bio conversion, thermo chemical methods.

**SECTION – D**

**Wave, Tidal and OTEC:** Introduction, Basic principle of tidal power, Wave energy, component of Tidal power plant, Ocean Thermal Energy Conversions, advantages and disadvantages of tidal power generation.

**Small and Mini Hydro power System:** Introduction, site development, generation and electrical equipment, system of regulation of Hydroelectric Power in India.

**BOOKS:**

- Renewable Energy Sources – Maheshwar Dyal.
- Small and mini Hydropower system by Tata Mc Graw Hill.
- An Introduction to power plant technology – G.D.Rai.
- Solar Energy – Suhas.P.Sukhatma, Tata Mc Graw Hill.
- Modern Power Plant Engg. – Joel

**SEMESTER – VIII**  
**ENERGY ASSESSMENT AND AUDITING(EE-8009)**

Course Code	<b>EE-8009</b>	Credits : 4	L-3, T-1, P-0
Name of the Course	<b>ENERGY ASSESSMENT AND AUDITING</b>		
Lectures to be delivered	<b>52 (1 Hr Each) (L = 39, T = 13 for each semester)</b>		
Semester End Examination	<b>Max. Time: 3 hrs.</b>	<b>Max. Marks: 100</b>	<b>Min. Pass Marks: 40</b>
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	<b>Max. Marks: 50</b>		

**Instructions**

- 1.For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- 2.For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

**SECTION – A**

**ENERGY MANAGEMENT PRINCIPLES:** Systems of Energy flow, principles of Energy flow and Energy conservation, Energy and money, Energy and growth, flow of energy in ecological system, Energy efficiency and demand side management (DSM), Economic evaluation.

**SECTION – B**

**ENERGY AUDIT:** Concepts and benefits of Energy Audit, Types of Energy Audits, National Energy Plan and its impact on energy conservation, Energy accounting and analysis, Energy audits of building systems, electrical systems, maintenance and energy audits.

**SECTION - C**

**MEASURING INSTRUMENTS:** Temperature measuring instruments, combustion system measuring instruments, measurement of heating, ventilation and air conditioning system performance.

**SECTION – D**

**ENERGY CONSERVATION IN INDIAN SCENARIO:** Energy demand and consumption in Indian industries, potential for energy efficiency in Indian industry, government's role in energy conservation and energy efficiency, Energy conservation techniques – conservation in energy intensive industries, economic evaluation of conservation techniques.

**BOOKS:**

1. Handbook of Energy Audits by Albert Thuman – Fairman Press Inc.
2. Energy basis for man and nature by Howard T.Odum & Elisbeth.C.Odum.

**Semester-VIII**  
**Development of Knowledge Management (IT-8012)**

Course Code	IT-8012	Credits-4	L-3, T-1, P-0
Name of the Course	Development of Knowledge Management		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

**Instructions**

- 1. For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- 2. For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

(TITLE APPROVED CONTENTS TO BE DECIDED LATER)

**Semester-VIII**  
**PROFESSIONAL ISSUES IN IT ( IT-8013)**

Course Code	IT-8013	Credits: 4	L-3, T-1, P-0
Name of the Course	PROFESSIONAL ISSUES IN IT		
Lectures to be delivered	52 (1 Hr Each) (L = 39, T = 13 for each semester)		
Semester End Examination	Max. Time: 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		Max. Marks: 50	

**Instructions**

**For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

**For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

**SECTION-A**

**Legal Issues:** Introduction to legal concepts, Basic outline of Criminal and Civil Laws, Concepts relating to laws and Contract and Commercial Law, Substantive legal issues, Intellectual property issues, Cyber crime, Data protection principles and implications of the European union Data protection Directive, Confidentiality and privacy, Intellectual property rights, Copyright and Industrial Property, Patents, Trade marks and laws relating to designs, Software protection and piracy, Dealing with Copyright, Originality, Exception to Copyright infringement, Employees and freelance programs, devices to overcome Protection Software Licensing, Methods of licensing, Copyright and electronic publishing, Copyright problems posed by electronic publishing.

**SECTION-B**

**Multimedia, licensing and related issues:** Protection of databases, Trade marks and passing off, Internet related issues, Contact issues and Law, Basic understanding of the Types of the Agreements in large computerization projects-Implementation Agreements, Licensing agreements, Maintenance Agreements, etc. Enforcement issues, dispute resolution, arbitration, legislative action.

**SECTION-C**

**Other Professional issues:** Duties of a professional, Duties to client, Duties to Employer, Duties to Profession, Duties to society, Accountability for quality, timeliness and use of resources, Human relationships and change management, Avoiding computer misuse, Hacking, unauthorized access and types of Computer Crime, Introduction of Viruses, Fraud and types of computer frauds, implications arising from the Draft Computer Crimes Act under the section D.

**SECTION-D**

Characteristics of Professions, Integrity and Honesty, Competence, Professional development, judgment, knowledge of law, relations, standards, independence, Acting with responsibility, Professional skill, comply with law, Confidentiality, due care, Contribute towards advancements of human welfare, Public interest, Public awareness, Basic Human rights, Ethics, and the Internet, Netiquette and Policy approaches, Professional relationships, Are computer professionals “Professionals”, Conflicting responsibilities and misconduct, Codes of Ethics.

**TEXT BOOK:**

- Professional Issues In Software Engineering(2<sup>nd</sup> edition), Bott F.et al.,1995,UCL Press.

**REFERENCE BOOKS:**

- (Eds), The Responsible Software Engineer, Selected Readings in IT Preofessionalism, Myers C.,Hall T. and Pitt D.,1997, Springer.
- BCS Code of conduct: <http://www.bcs.org/docs/01100/1194/pdf/codeofc.pdf>
- BCS Code of practice: <http://www.bcs.org/docs/01100/1194/Cop.htm>
- ACS code for Ethics: [http://203.58.197.209/acs/events\\_admin/static/national/pospaper/acs131.htm](http://203.58.197.209/acs/events_admin/static/national/pospaper/acs131.htm)
- ACS Professional conduct and professional practice: [http://203.58.197.209/acs/events\\_admin/static/national/pospaper/code2.htm](http://203.58.197.209/acs/events_admin/static/national/pospaper/code2.htm)

**Semester-VIII**  
**Computer Aided Fine Arts (IT-8014)**

Course Code	IT-8014	Credits-4	L-3, T-1, P-0
Name of the Course	Computer Aided Fine Arts (IT-8014)		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

**Instructions**

- 1. For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- 2. For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

**Section A**

**Painting and Drawing Software applications:** Drawing Software: Illustration applications (vector graphics), painting applications (bitmapped graphics) Drawing devices: Digitizing tablet, pressure sensitive stylus, mouse, touch screen.  
Collect and present examples of the use of digital painting and drawing in contemporary sources. Use drawing and painting software applications creatively to present a range of work.

**Section B**

**Image Manipulation:** Software Applications: Any software which will have features like distortion, adjust colour range, contrast, palettes and a range of tools with which to paint and adjust images files.  
**Digities:** Digital photography, scan, digitize.  
**Objects :** found objects, natural objects, domestic tools.  
**Image:** Photographs, found images, own visual work, hand written text, word-processed text.  
Digitize a range of objects and images in an appropriate file format for further development  
Manipulate and present scanned images in a range of way

**Section C**

Typographic design: Font design software: any software that will enable experimentation with Bitmapped fonts, postscript fonts, and True type fonts.  
Typographic Design Software: any software that will enable students to experiment with fonts and font design using a range of tools. Investigate the potential of digital typography  
Produce a range of work showing the creative use of typography, Combine typography with image in innovative ways.



**Section D**

Desk Top publishing and Text Editor: Text editing Software: Proprietary word processing applications with automated routines e.g. word count, spell checker, formatting styles, font styles, headers and footers. Design a range of page layouts using traditional methods, Prepare digital layout grid with common page elements, Prepare image, graphic and text files for the use in page layout, Format document and check for accuracy, and present in an appropriate format for print.

**Books: -**

1. B. Saraswati, Computerizing Cultures, New Age International Publishers, New Delhi.

### Semester-VIII

#### ENTREPRENEURIAL DEVELOPMENT & NEW ENTERPRISE MANAGEMENT(HU-8020)

Course Code	HU-8020	Credits-4	L-3, T-1, P-0
Name of the Course	ENTREPRENEURIAL DEVELOPMENT & NEW ENTERPRISE MANAGEMENT		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

#### Instructions

- 1. For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- 2. For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

#### SECTION –A

- Developing Entrepreneurship: Element for a program.
- Developing Entrepreneurship competencies : Need & process of development, social determinants of Entrepreneurship growth.
- Entrepreneurship development programs.
- Entrepreneurship orientation & awareness programme.
- New enterprise creation programme.

#### SECTION- B

- Existing Entrepreneurship programmes for existing enterprising for survival & growth. Evolution of various EDP programme in India.
- Managing growth & transition, the organization life cycle, chasing Entrepreneurship roles.

#### SECTION- C

- Entrepreneurship & new venture opportunities.
- Planning for new ventures.
- Concept of planning paradigm – pre-startup, early growth & later growth stage.

#### SECTION- D

- Incentive & subsidies available for Entrepreneurship growth.
- Guidance for project report preparation.
- Location, Environmental and managerial problems of new enterprise management .
- Managing family business. Some case studies of family run business in India.

**BOOKS:**

1. Deshpande, (1980),” Entrepreneurship of small scale industries,” Deep & Deep, New delhi.
2. Peter Kibly,” Entrepreneurship & Economic development ,” The free press ,New York,(1971).
3. Rehman, A.H.M.,Habibur,(1979),” Entrepreneurship & small enterprise development in Bangladesh University of Dacca.
4. Sharma, K.L., (1981), Entrepreneurship & Industrial development in Punjab”,PSE economic analyst , Vol.II, No.2.
5. David H. Holt ,(1998),” Entrepreneurship-New ventura creation,” Prentice Hall , New Delhi.

**Semester-VIII**  
**Accounts And Financial Management (HU-8021)**

Course Code	HU-8021	Credits-4	L-3, T-1, P-0
Name of the Course	Accounts And Financial Management		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

**Instructions**

- For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

**Section A**

**Accounting:** Principle, Concepts and conventions, double entry system of accounting, introduction of basic books of accounts of sole proprietary concern, control accounts for debtors and creditors, closing of books of accounts and preparation of trial balance.

**Final Accounts:** Trading, Profit and Loss Accounts and balance sheet of sole proprietary concern with normal closing entries. Introduction to manufacturing account, Final accounts of Partnership firms, Limited company.

**Section B**

**Financial Management:** Meaning and role.

**Ration Analysis:** Meaning, advantages, limitations, types of rations and their usefulness.

**Fund Flow Statement:** Meaning of the terms – fund flow and fund working capital cycle, preparation and interpretation of the fund flow statement.

**Section C**

**Costing:** Nature, Importance and basic principles, Budget and budgetary control: Nature and scope, importance, method of finalization of master budget and functional budgets.

**Marginal Costing:** Nature, Scope and importance, break – even analysis, its uses and limitations, construction of break-even chart, practical application of marginal costing.

**Section D**

**Standard Costing:** Nature and Scope, Computational and analysis of variances with reference to material cost, labor cost and overhead cost, interpretation of the variances.

Introduction to computerized accounting system: coding logic and codes required, master files transaction files; introduction to documents used for data collection, processing of different file sand output obtained.

**Books:**

- Kellock, J.: Elements of Accounting, Heinemann, 1978.
- Rockely, L.E.: Finance for the Non-Accountant, 2<sup>nd</sup> Edition, and basic books, 1976.
- Levy, and Sarnet: Principle of Financial Management, Prentice – Hall International.

**Semester-VIII**  
**Total Quality Management(HU-8022)**

Course Code	HU-8022	Credits-4	L-3, T-1, P-0
Name of the Course	Total Quality Management		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

**Instructions**

- For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

**Section-A**

Introduction to TQM & ISO 9000, Total Quality Control, Customer Focus & Total waste Elimination (TWE), Quality Assurance  
Quality of Design & Development, Inspection & Measurement workforce Teams, Benchmarking, TQM for Sales Marketing Management.

**Section-B**

Business Process Re-engineering & Information Technology, Quality control SQC/ SPC, Technology & Product Quality, Quality for After Sales Services Technology & Product Quality.

**Section-C**

Organization for Quality, Reliability as quality characteristics, Quality leadership, Quality linked productivity, Total Quality, Culture, Quality and environment, Cost of Quality.

**Section-D**

Cost of Quality, Quality Control for Export Units, Quality Maturity and Discipline, Total commitment for Quality, TQM Implementation, ISOm 9000 series of standards, ISO 9000-1, ISO 9000-2, ISO 9000-3.

**References:-**

- TQM & ISO 14000: K.C.Arora.
- Total Quality Control: Armand V. Feigenbaum.
- Total Quality Management: Joseph.A.Patrick, Diana.S.Furr.
- Total Quality Management – Text: Joel E. Ross Cases & Readin
- Total Quality Control Essentials: Sarv Singh Sooin

**SEMESTER – VIII**  
**ADVANCED OPERATIONS RESEARCH (ME – 8019)**

Course Code	<b>ME – 8019</b>	Credits : 4	L-3, T-1, P-0
Name of the Course	<b>ADVANCED OPERATIONS RESEARCH</b>		
Lectures to be delivered	<b>52 (1 Hr Each) (L = 39, T = 13 for each semester)</b>		
Semester End Examination	<b>Max. Time: 3 hrs.</b>	<b>Max. Marks: 100</b>	<b>Min. Pass Marks: 40</b>
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	<b>Max. Marks: 50</b>		

**Instructions**

- 1. For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- 2. For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

**SECTION – A**

**Introduction to Operations Research**

Formulation of problems, simplex method problem of degenerals, dual simplex method revised simplex method, bounded variable problems.

**Integer Programming**

Graphical method, the branch and bound technique, Gomary's ALL-IPP method, transportation model, unbalance in transportation, transshipment problem, sensitivity analysis in transportation problems.

**SECTION – B**

**Dynamic Programming**

Bellman's principle of optimality, examples on the application on routing problem, inventory problem, simplex problem, marketing problem.

**Network Analysis**

PERT and CPM, probability of achieving completion data, cost analysis, graph reduction theory, updating, resource allocation, resource smoothing.

**SECTION – C**

**Inventory Method:**

Variables in an inventory problem, inventory problem, inventory models with penalty, storage and quantity discount, safety stock, inventory models with probability, demand, multi item deterministic model.

**Queuing Theory**

Poisson arrivals and exponential service times, waiting time and idle time cost, single channel multi channel problem. Monte technique applied to queuing problems, Poisson arrivals and service time.

## **SECTION – D**

### **Decision Theory Game**

Examples on the application of theory of games 2 XM and MX2 Problems, graphic dominance and linear programming method for different problems, decision trees.

### **Replacement Models**

Replacement of items that deteriorate, gradually, fail suddenly, group placement policy, concept of system reliability.

### **Text Books:**

1. Kumar Gupta, Prem and Hira, D.S., “Operations Research”, S Chand & Company Limited, 1986.
2. Swarup, Kanti, Gupta, P.K. and Manmohan, “Operations Research”, Sultan Chand & Sons, New Delhi 1988.
3. Srinath L.S., “PERT & CPM Principles and Applications”, Affiliate East West Press (P) Limited, New Delhi, 1975.

**SEMESTER –VIII**  
**INDUSTRIAL MANAGEMENT( ME-8020)**

Course Code	ME-8020	Credits : 4	L-3, T-1, P-0
Name of the Course	<b>INDUSTRIAL MANAGEMENT</b>		
Lectures to be delivered	<b>52 (1 Hr Each) (L = 39, T = 13 for each semester)</b>		
Semester End Examination	<b>Max. Time: 3 hrs.</b>	<b>Max. Marks: 100</b>	<b>Min. Pass Marks: 40</b>
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	<b>Max. Marks: 50</b>		

**Instructions**

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total  
Marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

**Section – A**

**Management Concept**

Management, administration, organization, Difference and relationship between management, administration and organization. Types of organization. Characteristics of management. Origin of principles of management. Beginning of scientific management. Scientific management, principles of management, functions of management, management development.

**Personnel Management, Union and industrial relations**

Definition and concept. Aims, objectives or functions or personnel management. Principles of good personnel policy. Recruitment and selection of employees. Safety engineering, labour welfare, Promotion, transfer, lay-off and discharge.

Trade unions, industrial disputes, settlement of industrial disputes, collective bargaining, union-management relations.

**Section – B**

**Material, purchase and stores management.**

Material management, purchase and procurement, Purchase organization, purchasing procedure. Stores and material control. Receipts and issue of materials. Store records.

**Inventory control and management**

Inventory, inventory – control, classification, management. Objectives of inventory control, functions of inventories, Economic order quantity, ABC analysis, material requirement planning.

**Section – C**

**Financial Management**

Concept and definition. Purpose of investment. Types of capital. Sources of finance. Book – keeping, terms used in book – keeping. Assets and liabilities. The journal and the ledger. Trading account, capitalization, capital structure, difference between capital, capitalization and capital structure.

**Sales and marketing management**

Sales management, sales organization, function of sales department, Selling concept v/s marketing concept. Marketing – definition, principles and functions. Marketing research, sales forecasting. Sales promotion. Advertising, international Advertising.



## **Section – D**

### **Management by objectives**

Definition and concept, objectives. Steps in setting up MBO, advantages of MBO, limitations of MBO.

### **Management information system**

Definition, evolution of MIS, Need/objectives/functions of MIS. Difference between data and information. Need for information, information as an organizational resource. Management information categories. Designing information system. Computer system, components of computer system, integrated information system. Applications of MIS, future of MIS.

### **Text Books and References :**

1. Industrial Management; Spregiel Johan N. York 1961.
2. Industrial Organization; Kimbell & Kimbell Vakils Fetter & Simons Pvt Ltd. Bombay 1971.
3. Industrial Engineering and Mangement Dhanpat Rai New Delhi 1992.

**SEMESTER – VIII**  
**OPTIMIZATION METHODS FOR ENGINEERING SYSTEM(ME-8021)**

Course Code	<b>ME – 8021</b>	Credits : 4	L-3, T-1, P-0
Name of the Course	<b>Optimization Methods for Engineering System</b>		
Lectures to be delivered	<b>65 (1 Hr Each) (L = 52, T = 13 for each semester)</b>		
Semester Examination	<b>Max. Time: 3 hrs.</b>	<b>Max. Marks: 100</b>	<b>Min. Pass Marks: 40</b>
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	<b>Max. Marks: 50</b>		

**Instructions**

- 1. For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 15% of the total marks of the semester end examination for the course.
- 2. For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

**SECTION A**

Introduction: Engineering Application; Statement of the Optimal Problem;  
 Classification; Optimization Techniques;  
 Classical Method : Single Variable Optimization; Multivariable Optimization  
 Without any Constraints with Equality and Inequality Constraints.

**SECTION B**

One-Dimensional Minimization Method: Unimodal Function; Elimination  
 Method – Dichotomous Search, Fibonacci and Golden Method; Interpolation  
 Method – Quadratic and Cubic Interpolation Method.  
 Unconstrained Minimization Method: Univariate, Conjugate Directions, Gradient  
 And Variable Metric Method.

**SECTION C**

Constrained Minimization Method: Characteristics of a constrained problem;  
 Direct Method of feasible directions; Indirect Method of interior and exterior penalty functions.  
 Geometric Programming : Formulation and Solutions of Unconstrained and Constrained geometric  
 programming problem.

**SECTION D**

Dynamic Programming: Concept of Sub-optimization and the principal of optimality: Calculus, Tabular and  
 Computational Method in Dynamic Programming: An Introduction to Continuous Dynamic Programming.  
 Integer Programming : Gomory's Cutting Plane Method for Integer Linear  
 Programming; Formulation & Solution of Integer Polynomial and Non- Linear problems.

**Text Books:**

1. Optimization (Theory & Application)- S.S. Rao, Wiley Eastern Ltd, New Delhi.
2. Optimization Concepts and Applications in Engineering – Ashok D.Belegundu and Tirupathi R Chandrupatla – Pearson Education 1999, First India Reprint 2002.

**Reference Books:**

1. Optimization: Theory and Practice, C.S.G. Beveridge and R.S. Schechter, McGraw Hill, New York.