Course Name: HUMANITIES III (CORPORATE FINANCE)
Course Code : HU 404 Credits-4 : L T P: 4-0-0
Pre Req:
Lecture wise breakup No. of Lectures

1. **INTRODUCTION (07)**
   Finance, Financial Decisions, Objectives of Corporate Financial Decisions and factors influencing financial decisions.
2. **INDIAN FINANCIAL SYSTEM (07)**
   Nature and role of financial system in Indian Economy.
3. **FINANCIAL MARKETS (08)**
   Concepts, Type of markets and their relevance in present scenario.
4. **FINANCIAL INSTRUMENTS AND FINANCIAL SERVICES (08)**
   Capital and Money Market Instruments, Services.
5. **WORKING CAPITAL (05)**
   Types and factors affecting the requirements of working capital.
6. **SOURCES OF FINANCE (05)**
   Short term and long term.
7. **TIME VALUE OF MONEY AND CAPITAL BUDGETING (05)**
   Concept of Compounding and Discounting, Nature of Investment Decisions, Investment, Evaluation Criteria: Pay Back Period Method, Accounting Rate of Return Method, Internal Rate of Return Method and Net Present Value Method.
8. **FINANCIAL LEVERAGE (03)**
   Meaning (trading on equity) and measures.
9. **DIVIDEND POLICY (05)**
   Objectives of Dividend Policy, factors influencing firm's dividend policy.
10. **CAPITAL STRUCTURE (03)**
    Essentials of Capital Structure, Approaches to establish target capital structure.

BOOKS:

1. Pandey I.M., Financial Management, Vikas Publishing House Pvt.Ltd.
2. Khan M Y, Indian Financial System, Tata McGraw Hill.
3. Bhole LM and Mahakud Jitendra, Financial Institutions and Markets, Tata McGraw Hil

REFERENCES:

1. Chandra Prasanna, Financial Management Theory and Practice, Tata McGraw Hill
2. Lasher William R., Practical financial Management, Thomson
3. Van Horne J.C., Financial Management and Policy, Prentice Hall
4. Apte, P.G., International Financial Management, Tata McGraw Hill

HU404H (Humanities III) -In addition to the contents of HU404, additional topics:

Capital Market Intermediaries and their Regulation.
Functions and Operations of Money Market.
Foreign Exchange Market –From FERA to FEMA.
Role of Banks and Financial Institutions in Economic Development.

Course Name: HUMANITIES III (BUSINESS ENVIRONMENT& INDUSTRIAL LEGISLATION)

Course Code: HU 402 Credits: 4 L T P : 4-0-0

Pre Req:

Lecture Wise Breakup **No. of Lectures**

1. **INTRODUCTION** **(07)**
   Scope of business, Characteristics of business and its forms.
2. **BUSINESS ENVIRONMENT**
   Economic, Political and Technological. **(07)**
   Ecological and Global Environment and their relevance in present scenario. **(08)**
3. **SOCIAL RESPONSIBALITY OF BUSINESS** **(05)**
   Concept, Social Responsibility toward different interest groups and Business Ethics.
4. **GLOBALIZATION** **(07)**
   Meaning, Rationale for globalization, features of current globalization, Pros and Cons of globalization.
5. **WTO** **(07)**
   Functions of WTO. WTO structure, and Implications for India.
6. **CORPORATE GOVERNANCE** **(05)**
   Concept, Essentials of good Corporate Governance, One case study.
7. **CONTRACT ACT** **(05)**
   Concept of Contract, types and its essentials.
8. **SALE OF GOOD ACT** **(05)**
   Essential of sale of goods Act.

BOOKS:

1 Francis Cherunilam, Business Environment, Himalaya Publications.
2 K.C.Garg,V.K.Sareen,MukeshSharma andR.C.Chawla, Commercial & Labour Laws, Kalyani Publishers.

REFERENCES:

1. K Aswathappa, Essential of Business Environment, Himalaya Publication.
2. S.S.Gulshan, Mercantile Law, Excel Books.
3. S.S. Gulshan & G.K. Kapoor, Business Law, New Age International (p) Ltd.,Publisher.
4. S Singh, Corporate Governance – Global Concepts & Practices, Excel Books.
5. Roger Benett, International Business, Addison Wesley Longhran, Delhi.
6. Y K Bhushan, Business Organization & Management, Sultan Chand & Sons.

HU402H (Humanities III) -In addition to the contents of HU402, additional topics:

Cluster Growth Model Vs SEZ
Innovative Dynamics of the Company
Foreign Market Entry Strategies
Competition Policy and Law
Corporate Social Responsibility-Two Case Studies

Course Name : **MICROWAVE & RADAR ENGINEERING**
Course Code : **EC 451**
Credits **: 4**
Design Points : **2**
LTP **: 4 0 0**

Pr-req. ***:***

Rationale:
After going through this course student should be able to Analyze and Design various Microwave Circuits. Concept of Measurements at microwave frequencies, study of solid state devices will greatly enhance students understanding of Microwave systems and Analog Electronic circuits.

Lecture wise breakup **No. of Lectures**

MICROWAVE COMPONENTS ***(10)***
Attenuators and phase Shifters, bends, corners, twists, flanges, shorts, matched loads, tees(E-plane-plane & Hybrid), rat-race, directional couplers, scattering matrix. Ferrite Devices (isolator, circulator, gyrator), Cavity Resonators.

MICROWAVE MEASUREMENTS ***(05)***
Power and impedance measurement, measurement of SWR, frequency and wavelength.

SOLID STATE SOURCES ***(10)***
Limitations of conventional solid state devices at microwave frequencies, Transistors (MESFET, HEMT), diodes (Tunnel, varactor, PIN) Transferred electron devices (GUNN), Avalanche Transit time devices (IMPATT AND TRAPATT)

MICROWAVE TUBES ***(10)***
Limitations of conventional tubes at microwave frequencies, Klystron amplifier, Reflex klystron, magnetron, TWT, BWO, CFA's.

INTRODUCTION TO RADAR SYSTEMS ***(06)***
Basic Principle: Block diagram and operation of RADAR, Radar range equation, PRF's, Range Ambiguities. Applications of Radar's.

DOPPLER RADAR: ***(07)***
Doppler determination of velocity, CW Radar and its limitations, FM-CW radar, Basic principle and Operation of MTI Radar, Delay line Cancellers, Blind speeds and staggered PRF.

SCANNING AND TRACKING TECHNIQUES ***(08)***
Various Scanning techniques (Horizontal, Vertical, Spiral, Palmer, Raster, Nodding), Angle tracking system (Lobe switching, conical scan, monopulse), Range tracking systems, Doppler (velocity) tracking systems.

In addition to above contents **EC 451H** will include following topics:

Microwave Antennas

BOOK:

1. Microwave devices and circuits: Samuel Liao;PHI
2. Introduction to Radar systems: Merill I Skolnik

REFERENCES:

1. Microwave devices and Radar Engineering :M Kulkarni; Umesh Publications
2. Microwave Engg : KC Gupta
3. Foundation of Microwave Engineering :RE Collin; McGraw Hill

Course Name : ADVANCED COMMUNICATION
Course Code : EC 452
Credits : 4
Design Points : 2
LTP : 4 0 0

DIGITAL COMMUNICATION

Data Transmission (14)

TDM, TDM-PCM systems, Base band signal receiver, error probability, Optimum Filter, Coherent Reception, Correlation, Binary ASK,FSK and PSK systems – Coherent and Noncoherent, Comparison of Digital Transmission schemes, Bandwidth and Power requirements, M-ary PSK, M-ary FSK differential PSK, QPSK schemes.

Data Reception (5)

Optimum threshold Detection, General Analysis, Optimum Receiver.

OPTICALCOMMUNICATION (22)

Characteristics of optical transmission media, Optical fibers – Fabrication techniques, Transmission characteristics, Loss and dispersion in fibers , Optical sources - principles of operation, Modulation characteristics and Driver circuits, Optical Receivers- Photo detectors and Performance Characteristics of Receivers, Fiber optic connectors, Couplers, Multiplexers and splices, Multi-channel transmission, , DWDM Techniques, Optical amplifiers.

AN INTRODUCTION TO FIBER OPTIC NETWORKS (8)

Elements of the architecture of fiber optic Networks: - Networks, Protocols and Services, Open System Interconnection (OSI) Reference model, Layered Architecture of fiber optic Networks, Optical layer Network Management and the Future of fiber optic Networks.

EMERGING DIGITAL COMMUNICATION TECHNOLOGIES (6)

An introduction to **S**pread spectrum techniques, Design of 1D, 2D and 3D codes,

In addition to above contents **EC 452H** will include following topics:

DTH, HDTV, LED TV, MONOLITHIC TV, DSL, Integrated Optics, Fiber Optic Sensors.

BOOKS:

1. Fiber-Optic Communications Technology, by Djafar K. Mynbaev and Lowell L. Scheiner (Prentice-Hall)
2. Digital Communication Taub Schilling.

Course Name: HDL BASED SYSTEM DESIGN
Course Code : EC 456
Credits: 4
L T P: 4 0 0
Pre Req:
Lecture wise breakup No. of Lectures

FINITE STATE MACHINES (8)

Introduction to Synchronous Sequential Circuits, Asynchronous Sequential Circuits, The Finite State Model, Memory Elements and Their Excitation Functions, Analysis and Synthesis of Synchronous Sequential Circuits, Computing Machine. Flow tables, Analysis and Synthesis, Races and Cycles, hazards in asynchronous circuits

BASIC VHDL ELEMENTS (5)

Identifiers, Data Objects, Data Types, Operators.

MODELING (15)

Behavioral modeling: Entity declaration, architecture body, Various Sequential Statements and Constructs, multiple processes, postponed processes. Dataflow Modeling: Concurrent Signal Assignment Statements, delta delay model, multiple drivers, block statement, concurrent assertion statement. Structural Modeling: Component Declaration, component Instantiation, resolving signal values.

SUPPORTING CONSTRUCTS (8)

Generics and Configuration, Subprograms and Overloading, Operator overloading, Package declaration, package body, design Libraries, visibility

ADVANCED FEATURES (4)

Generate statements, qualified expressions, type conversions, guarded signals, attributes, aggregate targets.

MODEL SIMULATION (5)

Writing a Test Bench, Simulation, Use of text file for input and output, Hardware Modeling Examples.

PROGRAMMABLE LOGIC DEVICES (PLD) AND FIELD PROGRAMMABLE GATE ARRAYS (FPGA) (10)

Basic Concepts, Architecture and Usage. Combinational Logic Design with PLDs/FPGAs**:** Adders/Subtractors, ALU, Multipliers, Shifters. Sequential Logic Design with PLDs/FPGAs**:** Synchronous Sequential Circuits, Asynchronous Sequential circuits, Modeling and Simulation of Moore and Mealy FSMs.

BOOKS:

1. VHDL Primer, J Bhaskar, Prentice Hall
2. VHDL: Analysis and modeling digital systems, by Z Navabi, McHill.
3. VHDL: Programming by example, Douglas L Perry, McHill Professional.
4. Switching and Finite Automata Theory, Zvi Kohavi , TMH 2nd Edition

Course Name: INFORMATION THEORY AND CODING
Course Code : EC 457
LTP :4 0 0
Credits : 4

Lecture wise breakup No. of lectures

INTRODUCTION (2)

Overview of Shannon's contributions to Information Theory and the digital communication system.

MODULATION & DETECTION (6)

Digital modulation: Modulation classification, Signal space representation & the symbol constellation,Linear memoryless modulation scheme examples

Optimum detection: Correlation demodulator & matched filter,Optimum symbol detectors

Detector performance for several modulation schemes

INFORMATION THEORY - AN OVERVIEW (8)

A single random variable:Discrete-valued random variable,Continuous-valued random variables

Two random variables-Discrete-valued random variables,Continuous-valued random variables,One discrete, one continuous valued random variable, Multiple random variables, Random sequences & entropy rate

SOURCE CODING (4)

Lossless coding for discrete-valued sources,Discrete memoryless source (DMS) Discrete stationary source,Lossy coding for discrete-time sources

CHANNEL CAPACITY & INTRODUCTION TO CHANNEL CODING (2)

Channel models,Channel capacity,The noisy channel coding theorem

BLOCK CODES (10)

Introduction to block codes,A Galios field primer,Linear block codes,Initial comments on performance & implementation,Important binary linear block codes,Binary linear block code decoding & performance analysis, Nonbinary block codes - Reed-Solomon (RS) codes,Techniques for constructing more complex block codes: product codes, interleaving, concatenated block codes, Space-time block codes: multipath fading channels, diversity techniques, spatial/temporal diversity

CONVOLUTIONAL CODES (8)

Linear convolutional codes & their descriptions,Transfer function representation & distance properties,Decoding convolutional codes,Soft-decision MLSE,Hard-decision MLSE,The Viterbi algorithm for MLSE,Performance of convolutional code decoders,Viterbi algorithm implementation issues: RSSE, trellis truncation, cost normalization,Sequential decoding: Stack, Fano, feedback descision decoding,Techniques for constructing more complex convolutional codes

TURBO & LOW DENSITY PARITY CHECK (LDPC) CODES (8)

Decoding algorithms which generate extrinsic information

Turbo codes,Turbo product codes,Turbo equalization,Low Density Parity Check (LDPC) coding & decoding-Basic graph theory concepts,Graph representation of LDPC codes,Decoding LDPC codes

TRELLIS CODED MODULATION (TCM) (4)

Introduction,Trellis coding with higher order modulation,Set partitioning,Trellis coded modulation (TCM),TCM decoding and performance

BOOK: Digital Communications, by John Proakis & Masoud Salehi, 5-th edition ,McGraw-Hill, 2008.

Course Name: Departmental Lab VI (Advanced Communication)
Course Code: EC 453
L T P : 0 0 3
Design Points : 2

LIST OF EXPERIMENTS

1.To measure output waveforms through fiber optics educator kit using various digital interfaces & analog transmission.
2.Setting up fiber optical analog and digital link.
3.To measure the effect of pulse broadening on the bandwidth of a fiber optical link.
4.Familiarization with LASER communication system.
5.To determine the losses and numerical aperture in optical fiber.
6.Familiarization with following instruments:
(A) Fiber optical power meter.
(B) Fiber optical power source.
(C) RS-232 link.
7.To analyze and investigate the Time division multiplexing and demultiplexing.
8.To realize and investigate following digital modulation and demodulation techniques:
1.Pulse code modulation/demodulation.
2.Delta/Sigma modulation/demodulation.

9. To measure the insertion loss and back-reflection/return loss for a series of fibre optic components(i.e. coupler,WDM,isolator, circulator,DWDM Mux/Demux devices.
10. To determine the isolation /extinction ratios in various optical components.
11. To Examine the narrowband wavelength response for a number of optical components.
12. To investigate the temperature tuning of a bragg grating.
13. To measure the light,voltage and current (LVI) characteristics of a DFB laser with operating temperature.
14. To investigate the two channel WDM system.
15. To measure the cross talk in WDM system.
16. To Examine the cross talk of WDM system by changing the source operating wavelength.
17. To investigate the influence of system cross-talk on the Eye diagram/BER in WDM system(requires BER(COM))
18. To Investigate and measure the Error Probability in digital transmission.
19. To measure the attenuation in fiber optic cables,connectors and splicing losses by fiber optic power source benchmark kit.
20. To simulate and design optical fiber communication set up using various parameters.
21. To simulate and analyze the timing jitter and BER in 5km optical communication system.
22. To determine and compare the BER and Q-factor of raman and Brillouin Amplifier.
23. To simulate the 8×1 WDM system and analyze its eye-diagram.
24. To determine and measure the optical power attenuation of 1550nm signal in 10km optical communication system.

Course Name: Departmental Lab VII (DSP/ Microwave)
Course Code: EC 454
L T P : 0 0 3
Design Points : 2

LIST OF EXPERIMENTS

1. Hands on Experience on MATLAB and generation of digital signals
2. Write MATLAB Program for Discrete Convolution, Impulse Response of finite and infinite signals.
3. Determine and plot Fourier Transform (magnitude and phase) for the infinite duration sequence.

$x(n) = 1 \quad 0 \leq n \leq \infty$
$= 0 \quad$ otherwise

4. Given a Causal System

$y(n) = .9\, y(n-1) + x(n)$

(i) Find H (z) and sketch its pole zero plot
(ii) Plot $(H(e^{jw}))$ & $< H(e^{jw})$
(iii) Determine Impulse Response

5. Determine o/p of the given system

$y(n) - y(n-1) + .9y(n-2) = x(n)$

(i) Calculate and plot impulse response h (n) from n = (-20, 100)

(ii) Calculate and plot unit step response s (n) from n = (-20, 100)

6. An LTI system is specified by the difference equation

$$Y(n)= 0.8\ y(n-1) + x(n)$$

a) Determine $H(e^{jw})$

b) Calculate and plot steady state response $Y_{ss}(n)$ to

$X(n) = \cos(0.05\prod n)\ u(n)$

7. $X_1(z) = z + 2 + 3z^{-1}$ and $X_2(z) = 2z^2 + 4z + 3 + 5z^{-1}$

Determine $X_3(z) = X_1(z)\ X_2(z)$ using convolution theorem.

8. Determine the DTFT of each of the following sequences. Plot magnitude and angle of $X(e^{jw})$ using MATLAB.

a) $x(n) = 3(0.9)^n\ u(n)$

b) $x(n) = 2(0.8)^{n+2}\ u(n-2)$

9. Design a FIR low pass filter with the following specifications:

$W_p = 0.2\prod$ $R_p = 0.25$ dB

$W_s = 0.3\prod$ $A_s = 50$ dB

Plot frequency response of the filter.

10. Transform $H_a(s) = \dfrac{S+1}{S^2 + 5s + 6}$

Into a digital filter H(z) using the impulse invariance technique in which T= 0.1

Plot the frequency and impulse response .

11. Design a low pass Butterworth filter to satisfy

Passband cutoff : $\Omega_p = 0.2\prod$

Passband ripple : $R_p = 7$ dB

Stopband cutoff : $\Omega_s = 0.3\prod$

Stopband ripple : $A_s = 16$ dB

Plot frequency response of the filter

12. Compute DFT and IDFT for the given signal x(n) = (6,5,4,3,2,1,).

13 Compute FFT of a real time input signal using DSP kits.

14 Design and implement IIR filter (LP, HP, BP) using DSP kits.

15 Design and implement FIR filters (LP, HP, BP) using DSP kits.

16 To study various microwave components.

17 To plot the radiation pattern and find the gain of horn antenna.

18 To verify the diode law, Wave guide law.

19 To plot Klystron mode curves.

20 Measurement of SWR and impedance of Coupler/Magic Tee.

21 Measurement of insertion loss and isolation of Coupler/Magic Tee.

22 To study rotary Vane Attenuator and find its S-parameters.