VI TERM ECE
4305 - COMMUNICATION SYSTEMS
VI TERM (APPLIED COURSE)

6 Hrs / Week Total Hrs : 72

MAJOR DIVISIONS
UNIT TOPIC
I RADAR AND NAVIGATIONAL AIDS
II DIGITAL COMMUNICATION
III FIBER OPTIC COMMUNICATION
IV SATELLITE COMMUNICATION
V COMPUTER COMMUNICATION SYSTEM

UNIT-I: [17 Hrs]
RADAR AND NAVIGATIONAL AIDS
Radar – frequency ranges – Radar system – Basic principles – Development of Radar
frequencies and powers used in radar – Radar performance factors – Factors influencing maximum
range – Target properties – Pulsed system – Basic Pulsed Radar System – Plan Position
Indicator – Automatic Target detection – Radio aids to navigation – Direction finding – Radio
approach system.

TELEPHONY AND FAX
Telephone system – Electronic Exchange – Facsimile communication systems – Introduction
– Facsimile sender – Cylindrical scanning – Tape Scanning – Scanning spot – Facsimile receiver
– Transmission of facsimile telegraph signals.

TELEVISION
Television fundamentals - Scanning principles - Synchronization - Aspect ratio - Composite
video signal - VSB Transmission - Intercarrier Sound Modulation - TV Standards - CCIR
B, NTSC, PAL, SECAM - Block diagram of a TV transmitter and TV Receiver.

UNIT-II: DIGITAL COMMUNICATION [12 Hrs]
Digital transmission system – Sources and signals – Processing operation in digital communication
– Characteristics – Bandwidth requirement – Speed, Noise, Baud rate – Cross talk –
Distortion – Digital codes – Baudot code – Error detection and correction codes – Parity check
codes - error correction codes – Digital systems – Classification – Digital modulation techniques
Image Restoration – Image Data Compression – Image Analysis.

UNIT-III: FIBER OPTIC COMMUNICATION [14 Hrs]
Introduction to fiber propagation using a ray model – Material Dispersion – Attenuation In
Optic Fiber – Fiber Production Methods – Cables – Step Index Fibers – Graded Index Fibers –
Optical Fiber Connection Joints and Couplers – Optical Sources – LED – Semiconductor LASER
for Optical Communication – Optical Detector - PIN – APD - Regeneration of Digital
Signals – Optical Transmitters and Receiver – Merits of Optical Fiber Communication –
Telecommunication – Local Distribution Services – Local data Transmission and telemetry –
Optical Fiber Digital Communication System – Applications – Civil, Industry & Military
Applications (with descriptive block diagram)

UNIT – IV SATELLITE COMMUNICATION [14 Hrs]
Satellite System - Frequency allocation for satellite services – Orbits – Kepler’s Law –
Apogee – Perigee – Orbit Perturbation – Active and passive Satellite – Geostationary Orbit –
Earth Eclipse of Satellite – Launching Orbits – Launch Vehicles – Parabolic Reflector – Offset
feed – Double Reflector Antenna
THE SPACE SEGMENT
Power Supply – Altitude Control – Station Keeping – Thermal Control - TT&C Subsystem
– Transponders – Antenna Subsystem
EARTH SEGMENT
Receive Only Home TV System – Transmit – Receive Earth Station.

SATELLITE SERVICES
UNIT – V [15 hrs]

COMPUTER COMMUNICATION SYSTEM
Introduction – Types of Network – LAN, WAN - MODEMS – Integrated Service Digital
Network – Internet Protocols – Types of Packet Switching – Internet – Web Browsing – EMAIL.

MOBILE COMMUNICATION
Cellular Communication – Frequency allocation – Cellular phones – Cordless Phones –
Video Phones - Satellite Multiple Access Techniques- TDMA- FDMA -CDMA –Video
Confereencing- Wireless Local Loop (WLL)

REFERENCE BOOKS
2. Roy Blake, “Electronic Communication Systems”, Adivision of Thomson Learning,

4306 - TELEVISION ENGINEERING
VI TERM (Applied Course)

MAJOR DIVISIONS

UNIT
I T.V. FUNDAMENTALS
II CAMERA AND PICTURE TUBES
III TELEVISION RECEIVERS
IV SYNC, DEFLECTION, EHT & REMOTE CONTROL
V TV TRANSMITTER AND MISCELLANEOUS TOPICS

UNIT I - T.V. FUNDAMENTALS [17 Hrs]
Simple block diagrams of TV transmission and reception - Scanning process - Sequential -
Horizontal and vertical scanning - Flicker and Interlaced scanning - Need and details of synchronization,
Blanking and Equalising pulses - Aspect ratio – Vertical resolution, Horizontal resolution,
Video Bandwidth – Relationship among them - Composite video signal - Serrated vertical sync pulse - Positive and negative transmission - Vestigial side band transmission of video signal - Merits and demerits – Inter-carrier sound – Signal frequencies for any one channel - TV
broadcast channel allocation – Different TV standards - CCIR system B in detail.
Additive mixing of colors - Color perception- Chromaticity diagram - Luminance and chrominance signals - I & Q signals - their polarity - Bandwidth for color transmission – Simple block diagrams of NTSC/SECAM Encoder and Decoder.

UNIT II - CAMERA AND PICTURE TUBES [16 Hrs]
Elements and characteristics of a camera tube – Construction, working principle and characteristics
of plumbicon - Silicon diode array - CCD image sensors - Comparison of vidicon,
plumbicon, saticon, newvicon, chalnicon camera tubes - Camera tube deflection and focussing
- Processing of camera signal – Production of Y and color difference signals from a color TV
camera.
Picture tube specification - Working and characteristics of monochrome picture tube - Phosphor
screen - screen burns – aluminum layer - Picture tube mountings for monochrome and color TV
including yoke - Types of color picture tubes – Working principle of delta gun, precision inline,
trinitron color picture tubes - Color convergence – static and dynamic - Color purity - Screen
grid adjustment - Automatic degaussing - Pincushion distortion - Flat panel display- Large
screen display methods – LCD projector.

UNIT III - TELEVISION RECEIVERS [17 Hrs]
Block diagram of monochrome TV receiver - functions of various blocks - RF tuner - types
- Block diagram of frequency synthesized Electronic tuner – Need for AGC - block diagram of
a keyed AGC system - Video IF amplifier response curve requirements – Block diagram of IC
UNIT IV - SYNC, DEFLECTION, EHT & REMOTE CONTROL (17 Hrs)
Need for sync pulse separator with block diagram - Sync separator circuit with noise gate
– Need for trapezoidal voltage for deflection coils – Block diagram of horizontal output stage with
EHT - HAFC block diagram with anti hunt network – Horizontal drive, width linearity controls
– Typical horizontal output circuit with EHT – function of PAL chroma decoder ICTA 7699-
functions and pin connections of IC TA 7680 – functions alone and IC names of TDA 8562,
MS5108SP.
Schematic diagrams of a remote control IR Transmitter and IR Receiver – Synthesis of
remote control signals – Synchronization of receiver - Functions of remote transmitter and
receiver ICs – M 50463P, M 50142P, IPC 1373HA – functions of system control ICs MN
15287, PCA 84C440P, MN 15284.

UNIT V - TV TRANSMITTER AND MISCELLANEOUS TOPICS [17 Hrs]
Block diagram of a Low level IF modulated TV transmitter - visual exciter - aural exciter -
diplexer - Color compatibility - color synchronization - Color plexed composite video
signal(CCVS) and weighting factor - Typical layout of TV station - PAL Color Coder –
functional blocks and working of each block – output waveforms – Modern cable TV system
schematic diagram - Scrambling – descrambling – block diagram of a basic descrambler – Digital
CCD telecine system – Steps involved in VCD making process – Block diagram of VCD player
in playback mode – Advantages of DVD over laser disc, video tape, VCD – DVD player block
diagram in play mode.

TEXT BOOKS:
1. R.R. Gulati - Modern T.V Practice
2. Arvind M. Dhake - TV and Video engineering
3. Bernard Grob - Basic Television & Video systems

REFERENCE BOOKS:
1. R.P.Gulafi, “Modern TV Practice”.
2. Arvind M.Dhake, “TV and Video Engg”.

UNIT 2: CONVERTERS AND INVERTORS (Qualitative treatment only) (14 hrs)
Converters:
a. Self commutations
b. Forced communications (mention of types only)
Polyphase converters with resistive load only
a. 3 Phase semi converters
b. 3 Phase full converter Dual converter.
Inverters:

UNIT 3: ROBOTICS AND ULTRASONICS (16 hrs)
Robotics:
Ultrasons:

UNIT 4: PROGRAMMABLE LOGIC CONTROLLER (14 hrs)
Evaluation of PLCs – hardwire control system definition – programmable logic control system: advantages of PLCs. Block diagram of PLC system symbols used – relays and logic functions – OR, AND, Comparator, Counters review.
Programming of PLCs – different methods – ladder STL and CSF, ladder programming of simple system like traffic light controller – conveyors – list of various PLCs available

UNIT 5: NUMERICAL CONTROL OF MACHINES (14 hrs)

REFERENCE BOOKS:
Industrial electronics: G.K. Mithal
Numerical: Yoram koren and Joseph Ben
Robotics and image processing: P.A. Jamakiraman
Thyrsitors and their applications: M. Ramamoorthy
Power Electronics – circuits device and applications: Rashid
Programmable controllers hardware software and applications – George L. Battin
Industrial robotics: Grower & others MGH
4307 - COMMUNICATION SYSTEMS LAB
VI TERM ( APPLIED COURSE )

6 Hrs / Week Total Hrs : 72

1. Construct a Transistor video amplifier and find the frequency response characteristic.
2. Construction and testing of a sync separator.
3. Construction and testing of a saw tooth generator for 3 different time constant.
4. To find deflection sensitivity of TV picture tube.
5. Study of TV receiver adjustments. Assembling and testing of Yagi antenna.
6. Simple faults in sound section and rectification.
7. Simple faults in video section and rectification.
8. Study of CCTV system.
9. Study of Composite video signal from video IF IC.
10. Observe the waveforms of FSK Transmitter and Receiver.
11. Observe the waveforms of PSK Transmitter and Receiver.
12. Setting up a fiber optic Analog link.
13. Setting up a fiber optic Digital link.
14. Losses in Optical Fiber
15. Measurement of Numerical Aperture
16. TDM of Signals.
17. Manchester Coding and Decoding
18. Analog Transmitter and Receiver.

Scheme of Examination
S.No Topics Marks
1 Exercise 70
2 Viva – Voice 5
Total 75

4404 - A - INDUSTRIAL ELECTRONICS LAB
VI TERM ( Diversified - IV )

6 Hrs / Week Total Hrs : 72

1. Construct A.C. timer circuit using transistor to operate a switching circuit after a time delay. (Time can be specified depending on the components available). Test its performance with a standard stopwatch.
2. Construct a D.C. timer circuit using transistor to operate a switching circuit after a time delay. Test its performance with a standard stopwatch.
3. Construct a sequence timer using 555-timer chip.
4. Construct and test the performance of the photo relay using LDR.
5. Construct a bias controlled half rectifier using SCR. Plot the firing angle output current graph for resistive load.
6. Construct and test the performance of a bias controlled full wave rectifier using SCR for resistive load. Plot the output waveform for different firing angles.
7. Construct and test the performance of a SCR triggering circuit using UJT.
8. Construct & test the performance of a battery charger circuit using SCR.
10. Speed control of stepper motor using micro controller.
11. Construct and test SCR regulated DC power supply.
12. PSPICE Simulation of SCR circuit.
14. Construct and test lamp dimmer using TRIAC.
15. Simulation of traffic light controller using PLC.
16. Construct and test temperature controller using UJT and TRIAC (using a thermistor).
17. Study of servo stabilizer.
18. Study of UPS.
SCHEME OF EXAMINATION
S.No Topics Marks
1 Exercise 70
2 Viva – Voice 5
Total 75

4308 – PROJECT WORK, ENTREPRENEURSHIP AND PERSONAL SKILLS
( VI TERM Applied course )

4 Hours /Week Total Hrs : 48

I. PROJECT WORK - INCLUDING REPORT
1. PROJECT WORK
A Project is a task in a selected area engaged by an individual or group of Students
with guidance of one or two faculty and / or from an Industry.
2. REPORT
The students should submit project report for evaluation. The project report should
contain synopsis, description, detailed work and drawings, cost particulars, performance study
report, any improvements needed, conclusion and bibliography.

II. PERSONAL SKILLS
The student is evaluated in the following areas are related to his project.
1. COMMUNICATION SKILL (PROJECT PRESENTATION)
Each student is to give a seminar in the project work. Presentation by OHP / Power
point is preferred.
2. GROUP DISCUSSION
The students will be evaluated by 1. participation 2. Respecting others view 3. Accepting
ones own mistakes 4. Reaction 5. Team spirit.
3. INTERVIEW / VIVA VOCE
The students will be asked to answer the questions for the interview may be the project
or any other relevant subject. regarding the project in English only.

III. ENTREPRENEURSHIP
Objective type questions may be asked in the Examination for a period of 1 Hour.

MAJOR DIVISIONS
UNIT 1 Entrepreneurship
UNIT 2 Business Counseling
UNIT 3 Finance
UNIT 4 Marketing
UNIT 5 Industry

UNIT 1 : ENTREPRENEURSHIP
Definitions of Entrepreneurship – Characteristics of Entrepreneurship – Traits of an
entrepreneur – Types of entrepreneur – Functions of an entrepreneur – Behavioral patterns of
entrepreneurs.

UNIT 2 : BUSINESS COUNSELLING
Business opportunity guidance – Project identification – Techno-economic survey –
Market research – Project formulation – Project selection – Project report format – Contents of
project report.

UNIT 3 : FINANCE
Sources of finance – Types of loans available – Financial Institutions – Institutions
assisting entrepreneurs.

UNIT 4 : MARKETING
Marketing channels – Channel design – choice of channel – Alternative channels of

UNIT 5 : INDUSTRY
Types of industries – Steps for starting a small industry – preparation of project report
– Guidelines, procedures, and formalities for registration – Selection of type of organisation –
Sole proprietorship – partnership – Joint stock company – Factors influencing the choice of an
organisation.

SCHEME OF EXAMINATIONS
S.No Topics Marks
1 Exercise 70
2 Viva – Voice 5
Total 75