Jabalpur Engineering College, Jabalpur

Semester VII Credit Based Grading System (CBGS) w.e.f. July 2018
Scheme of Examination
Bachelor of Engineering B.E. (Electronics & Telecommunication Engineering)
Subject Wise Distribution of Marks and Corresponding Credits
Scheme of Examination w.e.f. July 2018 Acadamic Session 2018-19

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted					Total Marks	Hours/Week			Total Credits	Total Marks
			Theory			Practical			L	T	P		
			End. Sem.	Mid Sem. MST	Quiz, Assignment	End Sem.	Lab Work						
1	EC7001	TV and Digital Display	70	20	10	30	20	150	3	1	2	6	
2	EC7002	Optical Communication	70	20	10	30	20	150	3	1	2	6	
3	EC7003	Radar and Advanced Antenna	70	20	10	30	20	150	3	1	2	6	
4	EC7004	Elective-III	70	20	10	-	-	100	3	1	-	4	
5	EC7005	Elective-IV	70	20	10	-	-	100	3	1	-	4	
6	EC7006	Project-I	-	-	-	60	40	100	-	-	4	4	
7	EC7007	Industrial Training (Two Weeks)	-	-	-	30	20	50	-	-	2	2	
		Total	**350**	**100**	**50**	**180**	**120**	**800**	**15**	**5**	**12**	**32**	**800**

MST: Minimum of two mid semester tests to be conducted. **L: Lecture** **T: Tutorial** **P: Practical**

Department Elective-III (Four Subjects)			Department Elective-IV (Four Subjects)	
S.No.	Subject Code	Subject Name	Subject Code	Subject Name
1	EC7004A	Information Theory and Coding	EC7005A	Wireless & Mobile Communication
2	EC7004B	Fuzzy Logic & Neural Network	EC7005B	Artificial Intelligence
3	EC7004C	Sensor Technology	EC7005C	RF Packaging & EM Compatibility
4	EC7004D	Marketing Management	EC7005D	Digital Image Processing

Controller (Exam)
Jabalpur Engineering College
Jabalpur - 482 011 (M.P.)

Registrar (Academic)
for Principal
Jabalpur Engineering College
Jabalpur - 482 011 (M.P.)

DEAN
Academic
JEC, Jabalpur (M.P.)

Principal
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Jabalpur Engineering College, Jabalpur (M.P)
Programme: B. E. Electronics &telecommunication Engineering (VII semester)
CBGS

Credit: 5 EC7001	TV & Digital Display	L:3, T:1,P:2

Course structure

Unit-I

Basics of T.V. Engineering, Scanning mechanism, interleaved scanning, block diagram of T. V. Transmitter, Image acquisition methods, Basic camera tubes based on photo voltaic, photo emissive, photo conductive phenomenon. Image orthicon and plumbicon camera tubes. Self scanning array, Charge coupled devices for camera. Composite video signals

Unit-II

Basics of T.V. Receiver, Bandwidth calculation. Channel bandwidth & Video bandwidth negative modulation, vestigial side band transmission transmitter and receiving antenna disk antenna,

Unit-III

Color T.V. fundamentals, luminance & chrominance signal in color T.V. camera, working Principle of color T.V. Transmitter and Receiver, subcarrier modulation: Line in precision tube, shadow mask tube, color burst

Unit-IV

Electronics displace devices LED, electro luminance display Electronic paper, E- ink plasma T.V. LCD display in T.V. thin film transistor display, OLED, Surface conduction electronic display LASER TV concept, quantum dot display theory, interferometric modulator display, Three dimensional display, Laser display. Holographic display swept volumetric display, tectile electronic display system for blind

Unit-V

Satellite T.V. Digital video Broadcasting HDTV, SDTV, comparison of Analog and Digital T.V. DTH, set top box fundamentals cable T.V. VSAT, IPTV, Hybrid IPTV, futuristic developments in T.V industry for new Technology

Books

1. TV Engineering by R R Gulati
2. Digital TV by R Rv Gulati

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TV & DIGITAL DISPLAY DEVICES LAB

LIST OF EXPERIMENTS:

1. To Study Picture Tube.
2. To Study RF Section.
3. To Study VIF Section.
4. To Study Vertical Deflection Section.
5. To. Study Horizontal Deflection Section and EHT Section.
6. To study chroma Section.
7. To Study Video Amplifier.
8. To Study Control System.
9. To Study Sound Section.
10. To Study Switch Mode Power Supply.
11. (a) To study the Transmission characteristics of the different Diode limiter configuration.
(b) To observe limiting action of sine wave on the C.R.O.
(c) To study the Diode capacitance at higher frequency.
12. (a) To study R-C differentiating Ckt Response at 1 KHz & 10 KHz for variouscombination of R & C.
(b) To study R-C Integrating Ckt Response at 1 KHz & 10 KHz for various combination of R & C.
13. To Study TV pattern Generator.

B.E. (CBGS) VII SEM E&TC Engg.

Subject Code – EC7001

TV AND DIGITAL DISPLAY

Course Outcome

Student will be able to-

CO 1: To understand the basics of picture acquisition devices , basic concept of different types of camera tubes.

CO2 : Developing Concept of TV transmitter and receivers and antennas for TV

CO3 : Basic concept and analysis of Color TV system and color TV transmitter and receivers

Co4: Developing concept about higher level display devices like lcd ,led plasma display system

CO5: Understanding and analyzing higher level television technology like internet tv vsat etc.

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Credit: 5 EC7002OPTICAL COMMUNICATION L:3, T:1,P:2

Course structure

Unit-I

Overview of Optical Fiber Communications (OFC): Motivation, optical spectral bands, key elements of optical fiber systems. **Optical fibers**: basic optical laws and definitions, optical fiber modes and configurations, mode theory for circular waveguides, single mode fibers, graded-index fiber structure, fiber materials, photonic crystal fibers, fiber fabrication, fiber optic cables.

Unit-II

Optical sources: Light emitting diodes (LEDs): structures, materials, quantum efficiency, LED power, modulation of an LED. Laser diodes: modes, threshold conditions, laser diode rate equations, external quantum efficiency, resonant frequencies, structure and radiation patterns, single mode lasers, modulation of laser diodes. **Power launching and coupling**: source to fiber power launching, fiber to fiber joints, LED coupling to single mode fibers, fiber splicing, optical fiber connectors.

Unit-III

Photo detectors: pin photo detector, avalanche photodiodes, photo detector noise, detector response time, avalanche multiplication noise. **Signal degradation in optical fibers:** Attenuation: units, absorption, scattering losses, bending losses, core and cladding losses. Signal distortion in fibers: overview of distortion origins, modal delay, factors contributing to delay, group delay, material dispersion, waveguide dispersion, polarization-mode dispersion. Characteristics of single mode fibers: refractive index profiles, cutoff wavelength, dispersion calculations, mode field diameter, bending loss calculation. Specialty fibers.

Unit-IV Optical receivers: fundamental receiver operation, digital receiver performance, eye diagrams, coherent detection: homodyne and heterodyne, burst mode receiver, analog receivers. **Digital links**: point to point links, link power budget, rise time budget, power penalties. **Analog links**: overview of analog links, carrier to noise ratio, multichannel transmission techniques.

Unit-V

Optical technologies Wavelength division multiplexing (WDM) concepts: operational principles of WDM, passive optical star coupler, isolators, circulators, Active optical components: MEMS technology, variable optical attenuators, tunable optical filters, dynamic gain equalizers, polarization controller, chromatic dispersion compensators. **Optical amplifiers**: basic applications and types of optical amplifiers, Erbium Doped Fiber Amplifiers (EDFA): amplification mechanism, architecture, power conversion efficiency and gain. Amplifier noise, optical SNR, system applications.

Performance Measurement and monitoring: measurement standards, basic test equipment, optical power measurements, optical fiber characterization, eye diagram tests, optical time-domain reflectometer, optical performance monitoring.

References:

1. G. Keiser: Optical Fiber Communications, 4th Edition, TMH New Delhi.
2. J. M. Senior: Optical Fiber Communication- Principles and Practices, 2nd Edition, Pearson Education.
3. G. P. Agarwal: Fiber Optic Communication Systems, 3rd Edition, Wiley India Pvt. Ltd.
4. J. C. Palais: Fiber Optics Communications,5th Edition, Pearson Education.
5. R.P. Khare: Fiber Optics and Optoelectronics, Oxford University Press.
6. A. Ghatak and K. Thyagrajan: Fiber Optics and Lasers, Macmillan India Ltd.
7. S. C. Gupta: Optoelectronic Devices and Systems, PHI Learning.
8. Sterling: Introduction to Fiber Optics, Cengage Learning.

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OPTICAL COMMUNICATION LAB

List of Experiments:

1. Launching of light into the optical fiber and calculate the numerical aperture and V-number.
2. Observing Holograms and their study.
3. Optic version Mach-Zehnder interferometer.
4. Measurement of attenuation loss in optical fiber.
5. Diffraction using gratings.
6. Construction of Michelson interferometer.
7. Setting up a fiber optic analog link and study of PAM.
8. Setting up a fiber optic digital link and study of TDM and Manchester coding.
9. Measurement of various misalignment losses in an optical fiber

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Subject Code – EC7002

OPTICAL COMMUNICATION

Course Outcome

Student will be able to-

CO 1: Understand basic laws of optical fibre communication

CO 2: Differentiate between various optical sources

CO 3: Interpret between various losses in optical fibre communication

CO4: Analyse various digital links

CO 5: Monitor different types of optical test equipment and amplifier

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CBGS

Credit: 5 EC7003RADAR AND ADVANCED ANTENNA

Course structure

Unit-I

Radar Equation, Radar Block Diagram and Operation, Prediction of Range, Minimum Detectable Signal, Receiver Noise, Probability Density Functions, S/N, Integration of Radar Pulses, Radar Cross-section, Transmitter Power, PRF and Range Ambiguities, Radar Antenna Parameters, System Losses and Propagation Effects.

Unit- II

MTI and Pulse Doppler Radar: Introduction, Delay line Cancellers, Moving target Detector, Limitation to MTI performance, MTI from moving platform, Pulse Doppler Radar

Unit- III

Tracking Radar, Sequential Lobing, Conical Scan, Monopulse tracking Radar, Low angle tracking, Pulse compression, Block Diagrams of Synthetic Aperture Radar (SAR), Phased array Radars,.
MST Radar, ECM, ECCM

Unit- IV

Radar Receiver, Mixers, Radar Displays, Receiver Protectors. Principles of Direction Finders, Aircraft Homing and ILS, Radio Altimeter, LORAN, DECCA, OMEGA, Inland Shipping Aids.

Unit- V

Microstrip Antenna, Various types of patch and slot Antenna, Design aspects of microstrip Antenna. Phased array antenna, active electronically steered array(AESA), passive electronically steered array (PESA), Array Effects, array error effects, element patterns & mutual impedance effects.

Text Book:

1. Radar Engineering and Fundamentals of Navigational Aids, G S N Raju, IK International Publishers, 2008
2. Introduction to Radar Systems, Skolnik, McGraw Hill, 2007.
3. Elements of Phased Array, " Robert J. Maillboux"

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RADAR & ADVANCED ANTENNA LAB

LIST OF EXPERIMENTS

1. To study the variation of field strength of radiated wave, with distance from transmitting antenna.
2. To plot radiation pattern of an omni directional antenna.
3. To plot the radiation pattern of a directional antenna. (Yagi-Uda 3- elements)
4. To study the phenomenon of linear & circular polarisation of antennas.
5. To demonstrate that the transmitting and receiving pattern of an antenna are equal & hence conform the reciprocity of the antennas
6. Study of dipole antenna/ folded dipole antenna & its radiation pattern.
7. Study of Yagi (3ele/4ele) antenna & its radiation pattern
8. Study of Log-periodic antenna & its radiation pattern.
9. Study of Parabolic reflector & its construction & its radiation pattern.
10. Study of Loop antennas, (Quad & Square loop)construction& its radiation pattern.
11. Study of Bioconicalantenna , construction & its radiation pattern
12 Study of Horn antenna
13. Study of Rhombic antenna

B.E. (CBGS) VII SEM E&TC Engg.

Subject Code – EC7003

RADAR AND ADVANCED ANTENNA

Course Outcome

Student will be able to-

CO1: Understand various RADAR parameters

CO2: Differentiate between MTI and pulse Doppler radar

CO3: Demonstrate various types of RADAR

CO4: Describe RADAR receivers and MIXER circuits

CO5: Interpret Microstrip Antennas

Jabalpur Engineering College, Jabalpur (M.P)
Programme: B. E. Electronics & telecommunication Engineering (VII semester)
CBGS

Credit: 4 EC7004(A) INFORMATION THEORY AND CODING

Course structure

Unit-I
Source Coding: A logarithmic measure of information, Average mutual information and entropy, Information measures for continuous random variables, Noiseless coding theorem, Coding for discrete memoryless sources, Discrete stationary sources, The Lampel-Ziv algorithm, Coding for analog sources, rate distortion function.

Unit-II
Channel Capacity and Coding: The converse to the coding theorem, Channel models, Channel capacity, Achieving channel capacity with orthogonal Signals, Channel reliability functions, Random coding based on M-ary Binary-coded signals, Practical Communication systems in light of Shannon's equation.

Unit-III
The Noisy-channel coding theorem: Linear Block codes, The generator matrix and the parity check matrix, Some specific linear block codes, Cyclic codes, Decoding of linear block codes, bounds on minimum distance of the linear block codes.

Unit-IV
Convolutional Codes: Basic properties of the convolutional codes, The transfer function of a convolutional code, Optimum decoding of convolutional codes- The Viterbi algorithm, Distance properties of binary convolutional codes, Other decoding algorithms for convolutional codes, Practical considerations in the application of convolutional codes.

Unit–V
Complex codes based on combination of simple codes: Product codes, Concatenated codes, Turbo codes, The BCJR algorithm.
Coding for Bandwidth-constraint channels: Combined coding and modulation, Trellis coded modulation.

References:

1. Simon Haykins: Communication Systems, 4th Edition, John Wiley.
2. J. G. Proakis: Digital Communications, McGraw Hills
3. B. P. Lathi: Modern Analog and Digital Communication System, Oxford University Press
4. R. G. Gallager: Information Theory and Reliable Communication, John Wiley and Sons
5. A. J. Viterbi and J. K. Omura: Principles of Digital Communications and Coding, McGraw Hill Series.
6. U. Madhow: Fundamentals of Digital Communication, Cambridge University Press.

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Elective-III

Subject Code EC7004 (A)

INFORMATION THEORY AND CODING

Course Outcome

Student will be able to-

CO1: Understand source coding techniques

CO2: Demonstrate various channel capacity theorems

CO3: Interpret Noisy channel coding techniques

CO4: Compare various convolution codes

CO5: Describe complex codes for different channels

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EC7004(8) FUZZY LOGIC & NEURAL NETWORKL:3, T:1,P:0

Course structure

Unit-I: Introduction to Neural Networks

Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Hodgkin-Huxley Neuron Model, Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN. Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Neural Dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules, Types of Application

Unit - II: Single and Multi Layer Feed Forward Neural Networks

Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications. Credit Assignment Problem, Generalized Delta Rule, Derivation of Back propagation (BP) Training, Summary of Back propagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

Unit - III: Classical & Fuzzy Sets

Introduction to classical sets – properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions.

UNIT - IV: Fuzzy Logic System Components

Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

UNIT - V: Applications

Neural network applications: Process identification, control, fault diagnosis and load forecasting. Fuzzy logic applications: Fuzzy logic control and Fuzzy classification.

Books

1. Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications by Rajasekharan and Rai – PHI Publication
2. Neural Networks – James A Freeman and Davis Skapura, Pearson Education, 2002.
3. Neural Networks – Simon Hakins , Pearson Education

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Credit: 4 EC7004 (6)SENSOR TECHNOLOGY

Course structure

UNIT I- Sensors Fundamentals and Characteristics

Sensors, Signals and Systems; Sensor Classification; Units of Measurements; Sensor Characteristics

UNIT II-Physical Principles of Sensing

Electric Charges, Fields, and Potentials; Capacitance; Magnetism; Induction; Resistance; Piezoelectric Effect; Hall Effect; Temperature and Thermal Properties of Material; Heat Transfer; Light; Dynamic Models of Sensor Elements

UNIT III- Interface Electronic Circuits
Input Characteristics of Interface Circuits, Amplifiers, Excitation Circuits, Analog to Digital Converters, Direct Digitization and Processing, Bridge Circuits, Data Transmission, Batteries for Low Power Sensors

UNIT IV- Sensors in Different Application Area
Occupancy and Motion Detectors; Position, Displacement, and Level; Velocity and Acceleration; Force, Strain, and Tactile Sensors; Pressure Sensors, Temperature Sensors

UNIT V- Sensor Materials and Technologies
Materials, Surface Processing, Nano-Technology

Reference Books:
1. J. Fraden, Handbook of Modern Sensors:Physical, Designs, and Applications, AIP Press, Springer
2. D. Patranabis, Sensors and Transducers, PHI Publication, New Delhi
3. Mechatronics- Ganesh S. Hegde, Published by University Science Press (An imprint of Laxmi Publication Private Limited).

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EC7004(D) Marketing Management

Course structure

UNIT I - Product-Meaning of Product, Quality of Product, features, Brand name and trade mark, after sale service, product line and product mix, packaging role and functions of packaging, Labeling

UNIT II -Pricing - Pricing objectives, Price determination, factor, influencing Pricing policy method of pricing, policies and strategies.

UNIT III - Promotion Understanding the four element of promotion mix advertising medias, publicity personal selling and salesmanship, public relation selling process, sales promotion techniques

UNIT IV-Place Distribution concept role, types of distribution channel factor affecting choice of distribution channel, whole selling and retiling, Marketing of services characteristics of sources. Problem of service marketing

UNIT V -Logistics Vehicle routing, scheduling and fleet dispatching, supply chain network design procurement, sourcing & auctions, management and minimizing of supply chain uncertainties supply contact and collaboration.

Books 1. Kolter Philip A frame work for marketing management Pearson Education India.

2. Rahul V Alteker supply chain management concept and cases prentice Hall of India

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EC7005(A) WIRELESS AND MOBILECOMMUNICATION

Course structure

Unit I- Radio propagation and Cell concept

Free space attenuation- Radio propagation factors (reflection, refraction, diffraction, scattering and earth curvature) - multipath delay spread, coherence bandwidth, coherence time- Fading distributions Rician, Rayleigh and Log normal-Level crossing rate and fade duration-Path Loss models, Okumara/Hata ,Cost 231, IMT 2000 and Indoor) - Fade Margin-Link Margin- cell radius – Hexagonal cell, 3 sector and 6 sector cell

Unit II

Evolution of mobile communication systems- 1G to 4G and future networks, Access methods- FDMA, TDMA, CDMA, SDMA, GSM services, GSM architecture, GSM Radio channels, protocols, Location Update and typical call flow sequences in GSM, Handover, security aspects, GPRS architecture and reference model.

Unit III

CDMAstandards:Spreadspectrum,directsequenceand frequencyhopspreadspectrum,IS-95CDMAarchitecture, forward linkandreverse link,cdma2000, WCDMA: UMTS and IMT 2000,EDGE, CAMEL,UMTS radio interface, WCDMA radio channels and Frame structure, UTRAN UE, Node-B, RNC, Core Network, Handovers

Unit IV

IntroductiontoWLAN: Infrastructurebasedandadhoc networks, CSMA/CA,IEEE802.11, IEEE 802.11 a/b/g/n, Introduction to WPAN : Bluetooth-architecture, protocol stack, physical and link control, security ,IEEE 802.15.4 LWPAN

Unit V

4GSystems:Introduction to OFDM,OFDMA, IEEE 802.16 PHY an MAC, simple WiMAX network Architecture overview, 3GPP LTE Overview.

TEXT Book – 1. T. S.Rappaport,WirelessCommunications,PHI,2002.
2. V. .K Garg, Wireless Communication and Networks , ELSEVIER,2007
3. MobileCommunication, JochenSchiller,Pearson
4. GSM, cdmaoneandcdma2000,RaymondSteel, Wiley
5. WilliamC.Y.Lee, Mobile CellularTelecommunications-Analog&Digital Systems, Mc.Graw Hill, 1995
6. OFDMandMC-CDMA,L. Hanzo, T.Keller, JohnWiley&Sons,Ltd

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AICTE

EC7005(B)ARTIFICIAL INTELLIGENCE

Course structure

Unit I: Meaning and definition of artificial intelligence, various types of production systems, Characteristics of production systems.

Unit II: Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and predicate logic, comparison of propositional and predicate logic, Resolution, refutation, deduction, theorem proving, inferencing, monotonic and non-monotonic reasoning.

Unit III: Probabilistic reasoning, Baye's theorem, semantic networks, scripts, schemas, frames, conceptual dependency, fuzzy logic, forward and backward reasoning.

Unit IV: Game playing techniques like minimax procedure, alpha-beta cut-offs etc, planning, Study of the block world problem in robotics, Introduction to understanding and natural languages processing.

Unit V: Introduction to learning, Various techniques used in learning, introduction to neural networks, applications of neural networks, common sense, reasoning, some example of expert systems.

References:-

Rich E and Knight K, Artificial Intelligence, TMH New Delhi.
Nelsson N.J., Principles of Artificial Intelligence, Springer Verlag, Berlin.
Barr A, Fergenbaub E.A. and Cohen PR. Artificial Intelligence, Addison Wesley, Reading
Waterman D.A., A guide to Expertsystem, Adision - Wesley, Reading
Artificial Intelligence Hand book, Vol. 1-2, ISA, Research Triangle Park. Kos Ko B, Neural Networks and Fuzzy system –PHI.
Haykin S, Artificial Neural Networks-Comprehensive Foundation, Asea, Pearson.

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EC7005(C)RF Packaging and Electromagnetic Compatibility

Course structure

UNIT I

EMC Requirements for Electronic Systems: Sources of EMI; Aspects of EMC; Radiated susceptibility; Conducted susceptibility; Electrostatic discharge; Design constraints for products; Advantages of EMC design; Transmission line per-unit-length parameters: Wiretype structures, PCB structures; High-speed digital interconnects and signal integrity.

UNIT II

Non-ideal Behavior of Components: Spurious effects of wires, PCB, component leads, resistors, capacitors, inductors, ferromagnetic materials, electromagnetic devices, MMIC components, digital circuit devices, and mechanical switches.

UNIT III

Conducted and Radiated Emissions: Measurement of conducted emissions; Power supply filters; Power supply and its placement; Conducted susceptibility; Simple emission models for wires and PCB leads; Simple radiated susceptibility models for wires and PCB leads.

UNIT IV

Crosstalk: Three-conductor transmission lines, shielded wires, twisted wires, shielding.

UNIT V

System Design for EMC: Safety ground; PCB design; System configuration and design.

Suggested Books:

1. Paul, C.R., "Introduction to Electromagnetic Compatibility", Wiley Interscience. 2006

2. Kaiser, K.L., "Electromagnetic Compatibility Handbook", CRC Press. 2004

3. Kodali, V.P., "Engineering Electromagnetic Compatibility: Principles, Measurement and Technologies", IEEE Press.

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EC7005(D)Digital image Processing.

Course structure

UNIT-I : DIGITAL IMAGE PROCESSING :

Elements of a Digital Image Processing system, Structure of the Human eye, Image formation and contrast sensitivity, Sampling and Quantization, Neighbours of a pixel, Distance measures, Image acquisition Systems, CMOS display demises

UNIT - II : IMAGE ENHANCEMENT :

Definition, Spatial domain methods, Frequency domain methods, Histogram modify technique, Neighborhood averaging, Media filtering, Low pass filtering, Averaging of multiple images, Image sharpening by differentiation and high pass filtering.

UNIT-III : IMAGE TRANSFORMS:

Introduction to Fourier transform-DFT, Properties of two dimensional FT, Separability, Translation, Periodicity, Rotation, Average value, FFT algorithm, Walsh transforms, Hadamard transform, Discrete Cosine transform, Wavelet transform and comparison of all the transforms.

UNIT – IV : IMAGE RESTORATION :

Definition, Degradation model, Discrete formulation, Circulant matrices, Block circulant matrices, Effect of diagnolization of circulant and block circulant matrices, Unconstrained and constrained restorations , Inverse filtering, Wiener filter, Restoration in spatial domain.

UNIT - V : IMAGE ENCODING :

Objective and subjective fidelity criteria, Basic encoding process, Variable length coding, LZW, Bit-plane coding-Bit-plane coding, Lossless predictive coding - Lossy compression: Lossy predictive coding, transform coding, wavelet coding. Image compression. Introduction to all the Image compression techniques and standards, CCITT, JPEG, JPEG 2000, Video compression standards . Basics of Pattern Recognition, image segmentation

References :

1. "Digital Image Processing" by Rafael, C. Gonzlez., and Paul, Wintz, Addison-Wesley Publishing Company.
2. "Fundamentals of Digital Image Processing" by Jain Anil K. Prentice Hall.
3. "Digital Image Processing" by Sosenfeld, and Kak, A.C., Academic Press.
4. The Image Processing Handbook, (5/e), CRC, 2006 by J.C. Russ,
5. Digital Image Processing with MATLAB by .R.C.Gonzalez& R.E. Woods; Prentice Hall, 2003

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Elective-IV

Subject Code EC7005 (D)

DIGITAL IMAGE PROCESSING

Course Outcome

Student will be able to:

CO1: Understand the digital image acquisition and concept of its processing.

CO2: Analyze the image properties, its enhancement and different algorithms.

CO3: Computations of digital image parameters in different time and frequency domain and restoration data.

CO4: Design compression algorithm of digital image and work on different standards of advanced techniques of compression and pattern recognition based on industrial applications.