MT241 DIGITAL SIGNAL PROCESSING

Credit: 3:1:0
Marks 40+60

Unit I Linear System and Convolution

Signals and Systems, Requirements for Linearity, Static Linearity and Sinusoidal Fidelity, Examples of Linear and Nonlinear Systems, Special Properties of Linearity, Superposition: the Foundation of DSP, Common Decompositions, Delta Function and Impulse Response, Convolution: Input Side Algorithm, Output Side Algorithm, Sum of Weighted Inputs, Common Impulse Responses, Mathematical Properties, Correlation

Unit II Discrete Fourier Transform

Family of Fourier Transforms, Notation and Format of the real DFT, Frequency Domain's , Independent Variable, DFT Basis Functions, Synthesis, Calculating the Inverse DFT, Analysis, Calculating the DFT, Duality, Polar Notation, Polar Nuisances, Spectral Analysis of Signals Frequency Response of Systems, Convolution via the Frequency Domain

Unit III Fourier Transform Properties & Transform Pairs

Linearity, Characteristics of the Phase, Periodic Nature of the DFT, Compression and Expansion, Multirate methods, Multiplying Signals (Amplitude Modulation), The Discrete Time Fourier Transform, Parseval's Relation, Delta Function Pairs, Sinc Function, Gibbs Effect, Harmonics, Chirp Signals

Unit IV Fast Fourier Transform & Introduction to Digital Filters

Real DFT Using the Complex DFT, How the FFT Works, FFT Programs, Speed and Precision Comparisons, Filter Basics, Information is represented in Signals, Time Domain Parameters, Frequency Domain Parameters, High-Pass, Band-Pass and Band-Reject Filters

Unit V Digital Filters

Moving Average Filters: Implementation by Convolution, Noise Reduction vs. Step Response, Frequency Response, Relatives of the Moving Average Filter, Recursive Implementation, Strategy of the Windowed-Sinc, Designing the Filter, Recursive Method, Single Pole Recursive Filters, Narrow-band Filters, Phase Response, Chebyshev and Butterworth Responses, Designing the Filter

Text Book:

Steven W. Smith, The Scientist and Engineer's Guide to Digital Signal Processing, Elsevier, 1997.

References:

1. John G. Proakis and Dimitris G.Manolakis, Digital Signal Processing, Algorithms and Applications, PHI of India Ltd., 2000.
2. Openheim and Schafer, Digital Time Signal Processing, Prentice Hall of India, 2002.
3. Emmanuel C. Ifeacher and Barrie W. Jervis, Digital Signal Processing – A Practical Approach, Addison Wesley Longman Ltd., UK,

MT265 GRAPHICS AND ANIMATION

Credit: 3:1:0
Marks 40+60

Unit I Principle of 2D Graphics
Basic geometric objects, Geometric transformations, Applications of transformations, Animation and movements based on transformations, Interpolators for continuous changes, implementations in Java 2D.Lines and pixel graphics, Structural algorithms, Drawing arbitrary curve, Antialiasing with Java 2D,Areas, texts and colours

Unit II Principles of 3D Graphics
Geometric transformations, Animational moving objects, Projections in Java 3D, modelling 3D objects, Surface modeling, Normal vectors for Java 3D

Unit III Visible Surface Determination
Clipping volumes, Algorithms for visible surface determination, Image precision techniques, Priority algorithms, Illumination and shading: Light sources, Reflections, shadings, textures, textures in Java 3D

Unit IV Special Effects and Virtual Reality
Fog and particle systems**,** Fog in Java 3D, Dynamic surfaces Interaction, Interaction in Java 3D, Collision detection, Collision detention in Java 3D, Sound effects, Sound effects in Java 3D, steroscopic viewing

Unit V Introduction to Animation
Homogeneous coordinates and transformation, Description of transformation in the display pipeline, Interpolation-Controlling the motion along a curve, Interpolation of rotations

Text Books
Frank Klawonn, Introduction to Computer Graphics Using Java 2D and 3D, Springer, 2008

References

1. Rick Parent, Computer Animation Algorithms and Techniques, Morgan Kaufmann publishers, 2002
2. James D.Foley, et al Computer Graphics Principles and Practices, Addison Wesley, 1996
2. Peter Shirley, et al, Fundaments of Computer Graphics, AK Peters Ltd, 2005
3. Issac Victor Kerlow, The Art of 3D Computer Animation and Effects, John Wiley, 2004

EC270 SATELLITE AND COMMUNITY RADIO

Credits 4:0:0
Marks 40+60

Unit I:
Introduction to community radio - Technology for community radio - Managing your stations.

Unit II:
Money and monitoring accountability - Broad casting Rules and laws .

Unit III:
Programming Volunteer support - Access and Disability - Developing communities .

Unit IV:
Training Individuals - Finding community Radio

Unit V:
Selling your service - Rural radio

Text Books:
1. David Page william Crawely “Saellites over south Asia” sage publication(1999)
2. Rural radio Parama Roy “Indian Traffic” sage publication (2000)

References:
1. Ananda Mitra “India Through The western lens” ” sage publication (2000)

EC271 STUDIO MANAGEMENT

Credits 4:0:0
Marks 40+60

Unit I:
Assisting with production planning -consulting on logistics. -Ensuring all staging, furniture and props are ready before the show starts. -Ensuring all equipment is in place and technical checks have been done. -Briefing presenters and talent. -Preparing the audience. -Coordinating rehearsals.

Unit II:
Relaying information between the control room, floor staff and talent. -Providing cues, timing and other information to presenters and talent.

Unit III:
Informing the director of any relevant off-camera action. -Preparing for upcoming parts of the show.

Unit IV:
Maintaining control of the audience and ensuring they are looked after.

Unit V:
Overseeing safety issues on the floor. -In outside broadcasts; liasing with venue staff, organizing talent, etc.

Text Book:
1. David French Michal Richards “Television in contemporary Asia”sage publication (1999)
Reference:

1. Peter ward “TV Technical Operations” sage Publications (2000)
3. J Watson “Media Communication” Elsevier Publishers (1999)

MA239 PROBABILITY AND RANDOM PROCESS

Credit: 3:1:0
Marks: 40+60

Unit I:
Axioms of probability – Probability spaces – Joint and conditional probabilities – Independent events.

Unit II:
Densities and distributions – Example, Properties of distribution and density functions – Joint distributions and densities – Conditional probability distribution and density functions – Independent random variables.

Unit III:
Function of random variables and random vectors – Statistical averages – Characteristic functions – Inequalities of Tchebyshev and Cauchy Schwartz – Convergence concepts and the central limit theorem (Proof not expected).

Unit IV:
Random process definitions – Basic concepts and examples – Stationarity and ergodicity – Second order processes – Weekly stationary process – Covariance functions and their properties – Wiener Khinchine theorem.

Unit V:
Linear operations – Gaussian process – Poisson process – Low-pass and Band-pass process noise representations.

Text Books:
1. Papoulis: “Probability, Random Variables and Stochastic Processes (2/e), Mc GrawHill, 1991.
2. Veerarajan, “Probability statistics and Random Process” Tata Mc Graw Hill, 2002.

Reference Books:
1. Davenport: “Probability and Random process for Scientists and Engineers”, Mc GrawHill.
2. E.Wong,“Introduction to Random Process”, Spiringerverlag.
3. H. Stark and J.W. Woods: “Probability, Random process and estimation theory for Engineers”, Prentice Hall