

Applying sensitivity analysis. The dual simplex method; Parametric linear programming; The upper bound technique.

UNIT – 6

7 Hours

Transportation and Assignment Problems: The transportation problem; A streamlined simplex method for the transportation problem; The assignment problem; A special algorithm for the assignment problem.

UNIT – 7

6 Hours

Game Theory, Decision Analysis: Game Theory: The formulation of two persons, zero sum games; Solving simple games- a prototype example; Games with mixed strategies; Graphical solution procedure; Solving by linear programming, Extensions.

Decision Analysis: A prototype example; Decision making without experimentation; Decision making with experimentation; Decision trees.

UNIT – 8

6 Hours

Metaheuristics: The nature of Metaheuristics, Tabu Search, Simulated Annealing, Genetic Algorithms.

Text Books:

1. Frederick S. Hillier and Gerald J. Lieberman: Introduction to Operations Research: Concepts and Cases, 8th Edition, Tata McGraw Hill, 2005.
(Chapters: 1, 2, 3.1 to 3.4, 4.1 to 4.8, 5, 6.1 to 6.7, 7.1 to 7.3, 8, 13, 14, 15.1 to 15.4)

Reference Books:

1. Wayne L. Winston: Operations Research Applications and Algorithms, 4th Edition, Cengage Learning, 2003.
2. Hamdy A Taha: Operations Research: An Introduction, 8th Edition, Pearson Education, 2007.

SIGNALS AND SYSTEMS

Subject Code: 10CS662

I.A. Marks : 25

Hours/Week : 04

Exam Hours: 03

Total Hours : 52

Exam Marks: 100

PART - A

UNIT – 1

7 Hours

Introduction: Definitions of a signal and a system; Classification of signals; Basic operations on signals; Elementary signals.



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UNIT – 2 **7 Hours**
Systems, Time-domain representations – 1: Systems viewed as interconnections of operations; Properties of systems; Convolution; Impulse response representation; Properties of impulse response representation.

UNIT – 3 **6 Hours**
Time domain representation – 2: Differential and difference equation representations; Block diagram representations.

UNIT – 4 **6 Hours**
Fourier Representation – 1: Fourier representation: Introduction; Fourier representations for four signal classes; Orthogonality of complex sinusoidal signals.

PART – B

UNIT – 5 **6 Hours**
Fourier Representation -2: DTFS representations; Continuous-time Fourier-series representations; DTFT and FT representations; Properties of Fourier representations.

UNIT – 6 **7 Hours**
Application of Fourier representations – 1: Frequency response of LTI systems; Solution of differential and difference equations using system function.

UNIT – 7 **7 Hours**
Applications of Fourier Representations – 2, Z-Transforms – 1: Fourier transform representations for periodic signals; Sampling of continuous time signals and signal reconstruction. Introduction to Z-transform; Properties of ROC; Properties of Z-transforms; Inversion of Z-transforms

UNIT – Z – 8 **6 Hours**
Transforms – 2: Transforms analysis of LTI systems; Transfer function; Stability and causality; Unilateral Z-transforms and its application to solve difference equations

Text Books:

1. Simon Haykin and Barry Van Veen: Signals and Systems, 2nd Edition, Wiley India, 2007.
(Chapters: 1.1 to 1.8, 2.2 to 2.5, 3.1 to 3.6, 4.2 to 4.3, 4.7, 7.1 to 7.6, 7.8)

Reference Books:

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1. Alan V. Oppenheim, Alan S. Willsky and S. Hamid Nawab: Signals and Systems, 2nd Edition, PHI, 1997, Indian reprint 2009.
2. Ganesh Rao D and Satish Tunga: Signals and Systems - A Simplified Approach, Sanguine Technical Publishers, 2003-04.

DATA COMPRESSION

Subject Code: 10CS663
Hours/Week : 04
Total Hours : 52

I.A. Marks : 25
Exam Hours: 03
Exam Marks: 100

PART - A

UNIT -1

7 Hours

Introduction, Lossless Compression -1: Compression techniques; Modeling and coding.

Mathematical preliminaries for lossless compression: Overview; Basic concepts of Information Theory; Models; Coding; Algorithmic information theory; Minimum description length principle.

Huffman coding: Overview; The Huffman coding algorithm, Minimumvariance Huffman codes; Application of Huffman coding for text compression.

UNIT - 2

6 Hours

Lossless Compression - 2: Dictionary Techniques: Overview; Introduction; Static dictionary; Adaptive dictionary; Applications: UNIX compress, GIF, PNG, V.42.

Lossless image compression: Overview; Introduction; Basics; CALIC; JPEG-LS; Multiresoution approaches; Facsimile encoding: Run-length coding, T.4 and T.6.

UNIT - 3

6 Hours

Basics of Lossy Coding: Some mathematical concepts: Overview; Introduction; Distortion criteria; Models.

Scalar quantization: Overview; Introduction; The quantization problem; Uniform quantizer; Adaptive quantization.

UNIT - 4

7 Hours

Vector Quantization, Differential Encoding: Vector quantization: Overview; Introduction; Advantages of vector quantization over scalar quantization; The LBG algorithm.

Differential Encoding: Overview; Introduction; The basic algorithm; Prediction in DPCM; Adaptive DPCM; Delta modulation; Speech coding; Image coding.

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