125COT01 LINEAR ALGEBRA AND ITS OPTIMIZATION TECHNIQUES L T P C
3 1 0 4

COURSE OBJECTIVES:

- To help students understand and apply the fundamental concepts of vector spaces, inner products, and linear transformations for solving problems in high-dimensional spaces.
- To develop the ability to analyze and compute eigenvalues, eigenvectors, and advanced matrix factorizations for use in system modeling and data analysis.
- To formulate real-world problems as linear programming models and solve them using graphical and simplex-based techniques.
- To introduce students to the optimization of unimodal functions using classical nonlinear optimization techniques in single-variable domains.
- To equip students with algorithmic strategies for solving multivariable unconstrained optimization problems using direct and descent-based methods.

UNIT I VECTOR SPACES 9+3

Vector spaces and subspaces, Linearly independence, Bases and dimension of a vector space, Rank, Change of basis, Inner product, norm, Gram-Schmidth process. Linear transformations.

UNIT II EIGENVALUES AND EIGENVECTORS 9+3

Eigenvalues and eigenvectors, Diagonalization, Eigenvectors and linear transformations, Complex eigenvalues, Discrete dynamical systems, Iterative estimates for eigenvalues, Singular value decomposition, QR decomposition.

UNIT III LINEAR PROGRAMMING 9+3

Formulation, Simplex method, Two phase method, Simplex multipliers, Dual and primal, Transportation model – Initial basic feasible solution -North-west corner rule, Least-cost method, Vogel's approximation method and optimum solution of transportation problem.

UNIT IV UNCONSTRAINED NONLINEAR PROGRAMMING 9+3

Unimodal function, Single variable optimization algorithms- Exhaustive search, Region-elimination method - Interval halving method - Fibonacci method.

UNIT V MULTIVARIABLE OPTIMIZATION ALGORITHMS 9+3

Direct search method - Univariate method, Pattern search methods - Hooke and Jeeves method, Descent method – Conjugate gradient method.

Total L:45 +T:15 = 60

REFERENCES:

1. David C Lay, "Linear Algebra and its Applications", Pearson Education, New Delhi, 2017.
2. Hamdy A Taha, "Operations Research: An Introduction", Pearson Education, New Delhi, 2017.
3. Howard Anton and Chris Rorres, "Elementary Linear Algebra: Applications Version", Wiley India, New Delhi, 2018.

4. Kalyanmoy Deb, “Optimization for Engineering Design, Algorithms and Examples”, PHI Learning Pvt Ltd, New Delhi, 2016.
5. Singiresu S Rao, “Engineering Optimization Theory and Practice”, New Age International, New Delhi, 2016.

COURSE OUTCOMES:

CO1 Apply the concepts of linear independence, basis, dimension, and Gram-Schmidt orthogonalization to transform vector spaces and perform linear transformations.

CO2 Analyze the diagonalization of matrices and perform eigenvalue decomposition including SVD and QR to interpret dynamic systems and matrix behavior.

CO3 Evaluate and solve linear optimization problems using simplex, duality, and transportation models, and select optimal solutions based on cost-effectiveness.

CO4 Apply methods like exhaustive search, Fibonacci, and interval halving to identify optimal values in single-variable nonlinear optimization problems.

CO5 Create and implement appropriate optimization algorithms (e.g., Hooke-Jeeves, conjugate gradient) for solving multivariate optimization problems.

CO-PO MAPPING

CO	PO 1	PO 2	PO3
1	3	-	2
2	3	-	2
3	3	-	2
4	3	-	2
5	3	-	2

125COT02 ADAPTIVE SIGNAL PROCESSING L T P C

3 0 0 3

COURSE OBJECTIVES:

- Understand the concept of signals in frequency domain.
- Estimate the signal spectrum by parametric and Non-Parametric approach.
- Design and analysis of filtering functions.
- Understand the concept of Adaptive filters.
- Apply multirate signal processing in various applications.

UNIT I DISCRETE RANDOM SIGNAL PROCESSING 9

Discrete Random Processes- Ensemble averages, stationary processes, Autocorrelation and Auto covariance matrices. Parseval's Theorem, Wiener-Khintchine Relation- Power Spectral Density-Periodogram, Spectral Factorization, Filtering random processes. Low Pass Filtering of White Noise. Parameter estimation: Bias and consistency.

UNIT II SPECTRUM ESTIMATION 9

Estimation of spectra from finite duration signals, Non-Parametric Methods-Correlation Method, Periodogram Estimator, Performance Analysis of Estimators -Unbiased, Consistent Estimators-Modified periodogram, Bartlett and Welch methods, Blackman –Tukey method. Parametric Methods - AR, MA, ARMA model based spectral estimation. Parameter Estimation -Yule-Walker equations, solutions using Durbin’s algorithm**.**

UNIT III LINEAR ESTIMATION AND PREDICTION 9

Linear prediction- Forward and backward predictions, Solutions of the Normal equations- Levinson-Durbin algorithms. Least mean squared error criterion -Wiener filter for filtering and prediction , FIR Wiener filter and Wiener IIR filters ,Discrete Kalman filter

UNIT IV ADAPTIVE FILTERS 9

FIR adaptive filters -adaptive filter based on steepest descent method-Widrow-Hoff LMS adaptive algorithm, Normalized LMS. Adaptive channel equalization-Adaptive echo cancellation-Adaptive noise cancellation- Adaptive recursive filters (IIR). RLS adaptive filters-Exponentially weighted RLS-sliding window RLS.

UNIT V MULTIRATE DIGITAL SIGNAL PROCESSING 9

Mathematical description of change of sampling rate - Interpolation and Decimation , Decimation by an integer factor - Interpolation by an integer factor, Sampling rate conversion by a rational factor, Filter implementation for sampling rate conversion- Direct form FIR structures, Polyphase filter structures, time-variant structures. Multistage implementation of multirate system. Application to sub band coding - Wavelet transform and filter bank implementation of wavelet expansion of signals.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

Upon Completion of this course, students will be able to :

CO1: Analyze the discrete signal parameters in time and frequency domain.

CO2: Estimate statistical parameter of the signal in frequency domain.

CO3: Estimate and predict the different forms of signals.

CO4: Design and develop Adaptive filters.

CO5: Implement Sub-band coding for various Applications.

REFERENCE BOOKS

1. Monson H.Hayes, Statistical Digital Signal Processing and Modeling, John Wiley and Sons, Inc.,Singapore, 2002
2. John G.Proakis, DimitrisG.Manolakis, Digital Signal Processing Pearson Education, 2002
3. G.M.REBEIZ, RF MEMS Theory, Design and Technology, John Wiley, 2003.
4. John G.Proakiset.al.,'Algorithms for Statistical Signal Processing', Pearson Education, 2002
5. DimitrisG.Manolakiset.al.,'Statistical and adaptive signal Processing', McGraw Hill, Newyork,2000
6. Rafael C. Gonzalez, Richard E.Woods, 'Digital Image Processing', Pearson Education, Inc., Second Edition, 2004.(For Wavelet Transform Topic)

CO-PO MAPPING

CO	PO 1	PO 2	PO3
1	3	3	1
2	3	3	1
3	3	3	1
4	3	3	1
5	3	3	1

125COT03 MODERN DIGITAL COMMUNICATION TECHNIQUES L T P C

3 0 0 3

COURSE OBJECTIVES

- To extend the theory of Constant envelope modulation to M-ary schemes and to familiarize the concept of Spread Spectrum.
- To develop the mathematical and algorithmic foundations of the error detecting and error correcting codes used in modern communications systems.

UNIT I DETECTION AND ESTIMATION 9

Pass band Transmission model - Gram Schmidt orthogonalization procedure, Geometric Interpretation of signals, Response of bank of correlators to a noisy input-Coherent detection of signals in noise, Probability of error - Correlation Receiver - Matched Filter - Detection of signals with unknown phase.

UNIT II EQUALIZATION TECHNIQUES 9

Band Limited Channels- ISI – Nyquist Criterion- Controlled ISI-Partial Response signals Equalization algorithms– Linear equalizer – Decision feedback equalization – Adaptive Equalization algorithms.

UNIT III CONVOLUTIONAL CODING 9

Representation of codes using Polynomial - State diagram - Tree diagram - and Trellis diagram, Decoding techniques: Maximum likelihood decoding - Viterbi algorithm- Sequential decoding Coded modulation for bandwidth constrained channels.

Trellis coded modulation : Set Partitioning - Four state trellis - coded modulation with 8-PSK signal constellation - Eight state trellis code for coded 8-PSK modulation - Eight state trellis for rectangular QAM signal constellations.

UNIT IV TURBO CODING 9

Introduction - Turbo Encoder -Turbo Decoder-Iterative Turbo Decoding Principles-Modifications of the MAP Algorithm - The Soft-Output Viterbi Algorithm (SOVA) -Turbo Coded BPSK Performance over Gaussian channels -Turbo Coding Performance over Rayleigh Channels.

UNIT V MULTICARRIER AND MULTIUSER COMMUNICATIONS 9

Single Vs multicarrier modulation, orthogonal frequency division multiplexing (OFDM), Modulation and demodulation in an OFDM system, An FFT algorithmic implementation of an OFDM system, Bit and power allocation in multicarrier modulation, Peak-to-average ratio in multicarrier modulation. Introduction to CDMA systems, multiuser detection in CDMA systems–optimum multiuser receiver, suboptimum detectors**,**successive interference cancellation**.**

TOTAL: 45 PERIODS

COURSE OUTCOMES

Upon Completion of this course, students will be able to :

CO1: Apply Digital communication technologies in a variety of engineering applications
CO2: Gain knowledge in equalization techniques
CO3: Implement Error control coding and Digital modulation techniques in MATLAB
CO4: Learn turbo coding and its comparison with Rayleigh channels
CO5: Learn about multicarrier and multiuser communication.

REFERENCE BOOKS

1. Simon Haykin, “Digital Communications”, John Wiley and sons, Reprint 2009

2. L. Hanzo, T.H. Liew & B.L. Yeap, “Turbo Coding, Turbo Equalization & Space-Time Coding”, Wiley, First Edition, 2002
3. Theodore S.Rappaport, “Wireless Communications”, Pearson Education, Second Edition 2002.
4. Stephen G. Wilson, “Digital Modulation and Coding”, Pearson Education, First Indian Reprint, 2003.
5. Rodger E. Ziemer, Roger L. Peterson, David E. Borth, “Introduction to Spread Spectrum Communications”, Prentice Hall, First Edition, 1995.
6. Lathi B P and Zhi Ding, “Modern Digital and Analog communication Systems", Oxford University Press, 2011.
7. Richard Van Nee & Ramjee Prasad, “OFDM for Multimedia Communications” Artech House Publication, 2001.
8. Nptel Lecture: http://aicte-stream/

CO-PO MAPPING

CO	PO 1	PO 2	PO3
1	3	3	2
2	3	3	2
3	3	3	2
4	2	3	3
5	3	2	2

125COT04 ADVANCED WIRELESS COMMUNICATION L T P C

3 0 0 3

Course Objectives

- To learn the concepts of wireless communication.
- To know about the various propagation methods, Channel models, capacity calculations, multiple antennas and multiple user techniques used in the mobile communication.

UNIT I WIRELESS CHANNEL PROPAGATION AND MODEL 9

Propagation of EM signals in wireless channel – Reflection, diffraction and Scattering-free space, two ray. Small scale fading- channel classification- channel models – COST -231 Hata model, NLOS Multipath Fading Models: Rayleigh, Rician, Nakagami, 5G Channel model requirements and Measurements, propagation scenarios, METIS channel models, Map-based model, stochastic model.

UNIT II CAPACITY OF WIRELESS CHANNELS 9

Capacity in AWGN, capacity of flat fading channel, capacity of frequency selective fading channels. Capacity of MISO, SIMO systems.

UNIT III DIVERSITY 9

Realization of independent fading paths, Receiver Diversity: Selection combining, Threshold Combining, Maximum-ratio Combining, Equal gain Combining. Transmitter Diversity: Channel known at transmitter, Channel unknown at the transmitter.

UNIT IV MIMO COMMUNICATIONS 9

Narrowband MIMO model, Parallel decomposition of the MIMO channel, MIMO channel capacity, MIMO Diversity Gain: Beam forming, Diversity-Multiplexing trade-offs, Space time Modulation and coding: STBC,STTC, Spatial Multiplexing and BLAST Architectures.

UNIT V MULTI USER SYSTEMS 9

Introduction to MUD, Linear decorrelator, MMSE MUD, Adaptive MUD, MIMO-MUD Application of convex optimization to wireless design

TOTAL: 45 PERIODS

Course Outcomes

On the successful completion of the course, students will be able to

CO1: Analyze the wireless channel characteristics and identify appropriate channel models

CO2:Understand the mathematics behind the capacity calculation under different channel conditions

CO3: Understand the implication of diversity combining methods and the knowledge of channel

CO4: Understand the concepts in MIMO Communications

CO5: Understand mulitiple access techniques and their use in different multi-user scenarios.

Reference Books

1. David Tse and Pramod Viswanath, *Fundamentals of wireless communications*, Cambridge University Press, First Edition, 2012
2. Andrea Goldsmith, Wireless Communications, Cambridge University Press, 2007.
3. Harry R. Anderson, "Fixed Broadband Wireless System Design", John Wiley, India, 2003.
4. Andreas.F. Molisch, "Wireless Communications", John Wiley, India, 2006
5. Simon Haykin& Michael Moher, "Modern Wireless Communications", Pearson Education, 2007.
6. Rappaport. T.S., "Wireless communications", Pearson Education, 2003.
7. Gordon L. Stuber, "Principles of Mobile Communication", Springer International Ltd., 2001.
8. Upena Dalal, "Wireless Communication", Oxford Higher Education, 2009.

CO-PO MAPPING

CO	PO 1	PO 2	PO3
1	3	3	3
2	3	3	3
3	3	3	3
4	3	3	3
5	3	3	3

125COT05 ADVANCED RADIATION SYSTEMS L T P C

3 0 0 3

COURSE OBJECTIVES:

- Understand the concept of Retarded vector potential with Heuristic and Maxwell's equation approach.
- Describe the concept of Antenna Arrays with different types and their pattern multiplication
- Examine the different Antenna synthesis method
- Design different types of Antennas with their characteristic
- Compare all the special antennas with their applications.

UNIT I ANTENNA FUNDAMENTALS 9

Antenna fundamental parameters, Radiation integrals, Radiation from surface and line current distributions -Introduction to numerical techniques- FEM, FDTD, MoM. Linear array -uniform array, end fire and broad side array, gain, beam width, side lobe level- Two dimensional uniform array-Phased array, beam scanning, grating lobe, feed network

UNIT II RADIATION FROM APERTURES 9

Field equivalence principle, Radiation from Rectangular and Circular apertures, Uniform aperture distribution on an infinite ground plane; Slot antenna; Horn antenna-Reflector antenna, aperture blockage, and design consideration.

UNIT III ANTENNA SYNTHESIS 9

Synthesis problem-Line source based beam synthesis methods - Fourier transform and Woodward-Lawson sampling method – Linear array shaped beam synthesis method – Low side lobe, narrow main beam synthesis methods - discretization of continuous sources. Schelkunoff polynomial method

UNIT IV MODERN ANTENNAS & MEASUREMENT TECHNIQUES 9

Base station antennas, PIFA – Antennas for WBAN – RFID Antennas – Automotive antennas,MIMO Antennas, Diversity techniques – Antenna impedance and radiation pattern measurements

UNIT V RECENT TRENDS IN ANTENNA DESIGN 9

UWB antenna arrays – Vivaldi antenna arrays – Artificial magnetic conductors/High impedance surfaces – Antennas in medicine – Plasma antennas – Antennas for millimeter wave communication - optimization techniques – Numerical methods

TOTAL:45 PERIODS

COURSE OUTCOMES

CO1: Calculate the Power radiated in far field and also familiar with Polarization concept.
CO2: Apply Antenna Arrays with N elements for specified Application
CO3: Summarize the Antenna based on their Specification and Performance, for various Applications
CO4: Categorize the micro strip antennas for different applications.
CO5: Understand about Special antennas

REFERENCE BOOKS

1. Balanis, C.A., “Antenna Theory” Wiley,2003
2. Warren L. Stutzman and Gary A. Thiele,“ Antenna theory and design”John Wiley and sons 1998
3. Jordan, E.C., “ Electromagnetic waves and Radiating systems”. PHI 2003
4. Krauss, J.D., “ Radio Astronomy” McGraw-Hill 1966, for the last unit (reprints available)
5. Krauss, J.D.,, Fleisch,D.A., “Electromagnetics” McGraw-Hill,1999

CO-PO MAPPING

CO	PO 1	PO 2	PO3
1	3	2	3
2	3	3	3
3	3	2	3
4	2	3	3
5	3	2	2

125COT06 **RESEARCH METHODOLOGY & IPR** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- To enable students to analyze various research methodologies and designs, including qualitative and quantitative approaches, to effectively frame and investigate research questions.
- To help students apply appropriate measurement techniques, sampling strategies, and data preparation methods for effective collection and presentation of research data.
- To develop the ability to evaluate research hypotheses, interpret multivariate data, and communicate findings through coherent written and oral presentations.
- To provide students with an understanding of the evolution, principles, types, and international frameworks governing Intellectual Property Rights and their role in research and innovation.
- To enable students to apply the procedures and legal requirements involved in patent filing, examination, and licensing within the broader context of innovation protection.

UNIT I RESEARCH DESIGN 9

Overview of research process and design, Use of Secondary and exploratory data to answer the research question, Qualitative research, Observation studies, Experiments and Surveys.

UNIT II DATA COLLECTION AND SOURCES 9

Measurements, Measurement Scales, Questionnaires and Instruments, Sampling and methods.Data - Preparing, Exploring, examining and displaying.

UNIT III DATA ANALYSIS AND REPORTING 9

Overview of Multivariate analysis, Hypotheses testing and Measures of Association. Presenting Insights and findings using written reports and oral presentation.

UNIT IV INTELLECTUAL PROPERTY RIGHTS 9

Intellectual Property — The concept of IPR, Evolution and development of concept of IPR, IPR development process, Trade secrets, utility Models, IPR & Bio diversity, Role of WIPO and WTOin IPR establishments, Right of Property, Common rules of IPR practices, Types and Features of IPR Agreement, Trademark, Functions of UNESCO in IPR maintenance.

UNIT V PATENTS 9

Patents — objectives and benefits of patent, Concept, features of patent, Inventive step, Specification, Types of patent application, process E-filling, Examination of patent, Grant of patent, Revocation, Equitable Assignments, Licences, Licensing of related patents, patent agents, Registration of patent agents.

TOTAL: 45 PERIODS

REFERENCES:

1. Cooper Donald R, Schindler Pamela S and Sharma JK, “Business Research Methods”, Tata McGraw Hill Education, 11e (2012).
2. Catherine J. Holland, “Intellectual property: Patents, Trademarks, Copyrights, Trade Secrets”, Entrepreneur Press, 2007.
3. David Hunt, Long Nguyen, Matthew Rodgers, “Patent searching: tools & techniques”, Wiley, 2007.

4. The Institute of Company Secretaries of India, Statutory body under an Act of parliament, "Professional Programme Intellectual Property Rights, Law and practice", September 2013

COURSE OUTCOMES:

Upon completion of the course, the student can

CO1: Describe different types of research; identify, review and define the research problem

CO2: Select suitable design of experiment s; describe types of data and the tools for collection of data

CO3: Explain the process of data analysis; interpret and present the result in suitable form

CO4: Explain about Intellectual property rights, types and procedures

CO5: Execute patent filing and licensing

CO-PO MAPPING

CO	PO 1	PO 2	PO3
1	3	2	3
2	3	2	2
3	3	1	3
4	2	1	3
5	3	3	1

125COP07 DIGITAL COMMUNICATION SYSTEMS LABORATORY L T P C

0 0 2 1

COURSE OBJECTIVES

- To study & measure the performance of digital communication systems.
- To provide a comprehensive knowledge of Wireless Communication.
- To learn about the design of digital filter and its adaptive filtering algorithms.

LIST OF EXPERIMENTS

1. Generation & detection of binary digital modulation techniques using SDR
2. MIMO system transceiver design using MATLAB/SCILAB/LABVIEW
3. OFDM transceiver design using MATLAB /SCILAB/LABVIEW.
4. Channel equalizer design using MATLAB (LMS, RLS algorithms)
5. Design and Analysis of Spectrum Estimators (Bartlett, Welch) using MATLAB
6. BER performance Analysis of M-ary digital Modulation Techniques (coherent & non coherent) in AWGN Environment using MATLAB/SCILAB/LABVIEW
7. Design and performance analysis of Lossless Coding Techniques - Huffman Coding and Lempel Ziv Algorithm using MATLAB/SCILAB/LABVIEW
8. Noise / Echo cancellation using MATLAB (LMS / RLS algorithms).
9. Wireless channel characterization.

TOTAL:45 PERIODS

COURSE OUTCOMES

CO1 Implement the adaptive filtering algorithms

CO2 Generate and detect digital communication signals of various modulation techniques using MATLAB.

CO3 Apply mathematical formulation to analyze spectrum estimation of a signal and bit rate determination of a transmission link

CO4 Analyze the performance of optimization algorithms for equalizing the channel or noise/echo cancellation

CO5 Able to design synchronization algorithm for Digital Communication systems

CO-PO MAPPING

CO	PO 1	PO 2	PO3
1	3	2	2
2	3	2	2
3	3	2	2
4	2	2	2
5	2	2	2

125COP08 **ADVANCED DIGITAL SIGNAL PROCESSING LABORATORY** **L T P C 0 0 2 1**

COURSE OBJECTIVES:

- To enable the student to verify the basic principles of random signal processing, spectral estimation methods and additive white Gaussian noise (AWGN) channel characterization
- To design and conduct experiments, as well as to analyze and interpret data to produce meaningful conclusions and match with theoretical concepts.

LIST OF EXPERIMENTS

USE APPROPRIATE SIMULATION TOOLS FOR THE FOLLOWING EXPERIMENTS:

1. Generation of Standard discrete time sequences (Unit Impulse, Unit Step, Unit Ramp, Sinusoidal and exponential signals) and carrying out of arithmetic operations and plotthe results
2. Generation of random sequences satisfying the given probability distributions such as Uniform, Gaussian, Rayleigh and Rician.
3. Design of FIR filters for the given specification and plot the frequency response of the designed filter
4. Design of IIR filters for the given specification and plot the frequency response of the designed filter
5. Analysis of finite word length effects of FIR filter coefficients
6. Estimation of power spectrum of the given random sequence using Nonparametric methods (Bartlett, Welch and Blackman Tukey)
7. Estimation of power spectrum of the given random sequence using parametric methods (AR, MA and ARMA)
8. Upsampling the discrete time sequence by L times and plot the spectrum of both thegiven sequence and upsampled sequence
9. Downsampling the discrete time sequence by M times and plot the spectrum of both thegiven sequence and dowsampled sequence
10. Design an adaptive filter to extract a desired signal from the given noisy signal by cancelling the noise using LMS Algorithm
11. Design an adaptive filter to extract a desired signal from the given noisy signal by cancelling the noise using RLS Algorithm

12. Implementation of Digital Filter Banks for the given specifications

TOTAL : 45 PERIODS

COURSE OUTCOMES:

Upon the completion of course, students will be able to

- **CO1:** Generate deterministic/Random sequences using simulation tool
- **CO2:** Design and analyze the frequency response of FIR/IIR digital filters for the givenspecifications
- **CO3:** Estimate power spectrum of the given random sequence usingparametric/nonparametric estimation methods
- **CO4:** Implement adaptive filters using LMS/RLS algorithm
- **CO5:** Analyze the discrete time systems at various sampling rates

CO-PO MAPPING

CO	PO 1	PO 2	PO3
1	3	2	2
2	3	-	2
3	3	2	2
4	2	-	-
5	3	2	2

AUDIT COURSES

X25COA01 ENGLISH FOR RESEARCH PAPER WRITING L T P C
2 0 0 0

Prerequisite: English

Course Objectives

- Teach how to improve writing skills and level of readability
- Tell about what to write in each section
- Summarize the skills needed when writing a Title
- Infer the skills needed when writing the Conclusion
- Ensure the quality of paper at very first-time submission

UNIT I INTRODUCTION TO RESEARCH PAPER WRITING 6

Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness

UNIT II PRESENTATION SKILLS 6

Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticizing, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts, Introduction

UNIT III TITLE WRITING SKILLS 6

Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check

UNIT IV RESULT WRITING SKILLS 6

Skills are needed when writing the Methods, skills needed when writing the Results, skills are

needed when writing the Discussion, skills are needed when writing the Conclusions

UNIT V VERIFICATION SKILLS 6

Useful phrases, checking Plagiarism, how to ensure paper is as good a sit could possibly be the first-time submission

Total: 30 Periods

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO1: Understand that how to improve your writing skills and level of readability
CO2: Learn about what to write in each section
CO3: Understand the skills needed when writing a Title
CO4: Understand the skills needed when writing the Conclusion
CO5: Ensure the good quality of paper at very first-time submission

REFERENCE BOOKS

1 Adrian Wallwork, Englishfor WritingResearchPapers,SpringerNew YorkDordrechtHeidelbergLondon,2011
2 DayR How to Write and Publish a Scientific Paper, Cambridge University Press2006
3 Goldbort R Writing for Science, Yale University Press (available on Google Books)2006
4 HighmanN,Handbook of Writing for the Mathematical Sciences, SIAM. Highman's book 1998.

CO-PO MAPPING

CO	PO 1	PO 2	PO3
1	3	-	2
2	3	-	2
3	3	-	2
4	3	-	1
5	3	-	2

X25COA02 DISASTER MANAGEMENT L T P C
2 0 0 0

COURSE OBJECTIVES

- Summarize basics of disaster
- Explain a critical understanding of key concepts in disaster risk reduction and humanitarian response.
- Illustrate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
- Describe an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
- Develop the strengths and weaknesses of disaster management approaches

UNIT I INTRODUCTION 6

Disaster: Definition, Factors and Significance; Difference between Hazard And Disaster; Natural and Manmade Disasters: Difference, Nature, Types and Magnitude.

UNIT II REPERCUSSIONS OF DISASTERS AND HAZARDS 6

Economic Damage, Loss of Human and Animal Life, Destruction of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts and Famines, Landslides and Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts.

UNIT III DISASTER PRONEAREAS ININDIA 6

Study of Seismic Zones; Areas Prone To Floods and Droughts, Landslides And Avalanches; Areas Prone To Cyclonic and Coastal Hazards with Special Reference To Tsunami; Post-Disaster Diseases and Epidemics

UNIT IV DISASTER PREPAREDNESSAND MANAGEMENT 6

Preparedness: Monitoring Of Phenomena Triggering a Disaster or Hazard; Evaluation of Risk: Application of Remote Sensing, Data from Meteorological And Other Agencies, Media Reports: Governmental and Community Preparedness.

UNIT V RISK ASSESSMENT 6

Disaster Risk: Concept and Elements, Disaster Risk Reduction, Global and National Disaster Risk Situation. Techniques of Risk Assessment, Global Co Operation in Risk Assessment and Warning, People's Participation in Risk Assessment. Strategies for Survival

Total: 30 Periods

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO1: Ability to summarize basics of disaster

CO2: Ability to explain a critical understanding of key concepts in disaster risk reduction and humanitarian response.

CO3: Ability to illustrate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.

CO4: Ability to describe an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.

CO5: Ability to develop the strengths and weaknesses of disaster management approaches

REFERENCE BOOKS

1 GoelS.L.,Disaster Administration And Management Text And Case Studies", Deep & Deep Publication Pvt.Ltd., NewDelhi,2009.

2 Nishitha Rai,SinghAK,"Disaster Management in India:Perspectives, issues and strategies"'New Royal book Company,2007.

3 Sahni,PardeepEt.Al.,"Disaster Mitigation Experiences And Reflections",Prentice Hall Of India, NewDelhi,2001.

CO-PO MAPPING

CO	PO 1	PO 2	PO3
1	3	2	2
2	3	2	2
3	3	2	2
4	3	1	1
5	3	2	2

X25COA03 CONSTITUTION OF INDIA L T P C

2 0 0 0

Course Objectives

- Understand the premises informing the twin themes of liberty and freedom from a civilrights perspective.
- To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional
- Role and entitlement to civil and economic rights as well as the emergence nation hood in the early years of Indian nationalism.
- To address the role of socialism in India after the commencement of the Bolshevik

Revolutionin1917and its impact on the initial drafting of the Indian Constitution.

UNIT I HISTORY OF MAKING OF THE INDIAN CONSTITUTION 5

History, Drafting Committee, (Composition & Working)

UNIT II PHILOSOPHYOFTHEINDIANCONSTITUTION 5

Preamble, Salient Features

UNIT III CONTOURS OF CONSTITUTIONAL RIGHTS AND DUTIES 5

Fundamental Rights, Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights, Right to Constitutional Remedies, Directive Principles of State Policy, Fundamental Duties.

UNIT IV ORGANS OF GOVERNANCE 5

Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President,Governor,CouncilofMinisters,Judiciary,AppointmentandTransferofJudges,Qualifications,

Power sand Functions.

UNIT V LOCAL ADMINISTRATION 5

District's Administration head: role and Importance, Municipalities: Introduction , Mayor and Role of Elected Representative, CEO, Municipal Corporation. Pachayati raj: Introduction, PRI: Zila Pachayat. Elected officials and their roles, CEO Zila Pachayat: Position and role. Block level: Organizational Hierarchy(Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy.

TOTAL: 30 PERIODS

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO1: Discuss the growth of the demand for civil rights in India for the bulk of Indians before thearrival of Gandhi in Indian politics.

CO2: Discuss the intellectual origins of the framework of argument that informed the conceptualization

CO3: of social reforms leading to revolution in India.

CO4: Discuss the circumstances surrounding the foundation of the Congress Socialist Party[CSP] under the leadership of Jawaharlal Nehru and the eventual failure of theproposal of direct elections through adult suffrage in the Indian Constitution.

CO5: Discuss the passage of the Hindu Code Bill of 1956.

REFERENCE BOOKS

1 TheConstitution of India,1950(BareAct),GovernmentPublication.

2 Dr.S.N.Busi,Dr.B.R.Ambedkar framing of Indian Constitution,1st Edition,2015.

3 M.P.Jain,Indian Constitution Law, 7th Edn.,LexisNexis,2014.

4 D.D.Basu,Introduction to the Constitution of India,LexisNexis,2015.

CO-PO MAPPING

CO	PO 1	PO 2	PO3
1	3	2	2
2	2	1	2
3	2	2	2
4	2	2	1
5	3	2	2