# BHARATI VIDYAPEETH'S COLLEGE OF ENGINEERING

(Approved by AICTE, New Delhi & Affiliated to Guru Gobind Singh Indraprastha University, Delhi)

*(An ISO 9001:2015 Certified Institution)*

A-4, Paschim Vihar, Main Rohtak Road, New Delhi – 110 063

## Department of Information Technology

## AY 2022-23

## Lecture Plan

### Class: 5th Sem, IT1

### Algorithms Design and Analysis                                ETCS-301

| S.No. | Topic | # Lectures |
|---|---|---|
| | **UNIT I** | |
| 1. | Asymptotic notations for time and space complexity | 2 |
| 2. | Methods for solving Recurrence relations | 2 |
| 3. | Brief Review of Graphs, Sets and disjoint sets, union | 1 |
| 4. | Sorting and searching algorithms and their analysis in terms of space and time complexity | 2 |
| 5. | Divide and Conquer:Binary search, merge sort, Quick sort | 2 |
| 6. | Strassen's matrix multiplication algorithms and analysis of algorithms for these problems. | 1 |
| | **UNIT II** | |
| 7. | Dynamic Programming: Ingredients of Dynamic Programming | 2 |
| 8. | Matrix Chain Multiplication | 2 |
| 9. | Longest common subsequence | 2 |
| 10. | Optimal binary search trees problems, 0-1 knapsack problem | 2 |
| 11. | Floyd Warshall algorithm, 0/1 knapsack problem | 2 |
| | **UNIT III** | |
| 12. | Greedy Method: General method, | 2 |
| 13. | Activity Selection problem | 1 |
| 14. | Fractional Knapsack problem | 1 |
| 15. | Huffman Codes, job sequencing with deadlines | 2 |
| 16. | Minimum spanning trees, Djkstra and Bellman Ford algorithms | 2 |
| 17. | Single source paths and analysis of these problems. | 2 |
| | **UNIT IV** | |
| 18. | String matching: The naive String-Matching algorithm, The Rabin-Karp Algorithm, | 2 |
| 19. | String Matching with finite automata, The Knuth-Morris Pratt algorithm. | 2 |
| 20. | Polynomial-time verification, NP- Completeness and reducibility, | 2 |
| 21. | NP-completeness proof, NP-Hard | 2 |
| 22. | Case study of NP-Complete problems (Vertex cover and clique problems) | 2 |

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## LESSON PLAN FOR V SEMESTER A.Y 2022-23

| Subject: MICROWAVE ENGINEERING | Subject Code: ETEC - 302 |
|---|---|

**BRANCH: ECE Credits: 4**

**Total Teaching Weeks in semester: 15 weeks**

**Total Lecture classes available: 45**

| S.No | Topic | Lecture (44) |
|---|---|---|
| | **Unit :1** | **11** |
| 1 | **Introduction of microwaves** and application of microwaves | 1 |
| 2 | Maxwell's equation, wave equation and their solution (in rectangular and circular coordinates), Boundary conditions, Poynting theorem, | 2 |
| 3 | **Waveguide: Rectangular waveguide:** TE and TM modes, field configurations, dominant and degenerative modes, propagation characteristics. | 3 |
| 4 | Power transmission and power loss in waveguide. Excitation of waveguide. | 1 |
| 5 | **Circular waveguide:** TE and TM modes, field configuration. | 2 |
| 6 | Introduction of planar transmission lines, micro strip line, strip line and coplanar line, comparison of coaxial, waveguide and planar transmission line. | 2 |
| | **UNIT:2** | **11** |
| 7 | **Microwave resonators:** rectangular and circular cavity resonator (resonant frequency and wavelength), Introduction of Re-entrant cavity resonator and toroidal resonator. | 3 |
| 8 | **Microwave Network Analysis:** limitation of Z, Y and H parameters for microwave circuits, scattering matrix representation for microwave network, properties of S- matrix. | 2 |
| 9 | **Waveguide components:** E -plane Tee, H-plane - Tee, Magic-Tee, RAT-RACE circuit, application of Tee junctions, directional coupler and its application. | 2 |

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# Lesson Plan

**Subject Name: Advanced Control Systems**   **Subject Code: ETEE 403**

**Class: B.Tech EEE**   **Name of Faculty: Dr.SUDHA.K**

**Department: EEE**   **Teaching Scheme: 3L + 1T  Total Lecture: 42**

| S.No. | Unit No. | Topics Details | No. of Lecture Allotted |
|---|---|---|---|
| 1 | UNIT-I State Space Analysis | Introduction, State Space representation of Continuous LTI system | 1 |
| 2 | | Transfer Function and state variables, transfer matrix | 2 |
| 3 | | Eigen values and vectors | 1 |
| 4 | | Solution of state equations | 1 |
| 5 | | Controllability and Observability | 2 |
| 6 | | Canonical forms (CCF, OCF, DCF, JCF). | 3 |
| 1 | UNIT-II Discrete System | Introduction to discrete time systems | 1 |
| 2 | | sampling process | 1 |
| 3 | | Z-transform and  inverse Z-transforms | 1 |
| 4 | | hold circuits | 1 |
| 5 | | presentation by difference equation and its solution | 1 |
| 6 | | pulse transfer function | 1 |
| 7 | | transient and steady state responses, Dead beat response, | 1 |
| 8 | | steady state error | 1 |
| 9 | | Representation of discrete systems in state variable form and its solution | 2 |
| 10 | | stability of digital control system | 1 |
| 11 | | digital equivalent of conventional controller/compensator | 1 |
| 1 | UNIT-III Non-Linear System | Introduction, Non-linear system behavior and different types of non-linearities | 1 |
| 2 | | Describing function analysis, assumptions and definitions | 2 |
| 3 | | DF of common non-linearities | 1 |
| 4 | | Phase Plane Analysis, singular points, construction of phase portrait, | 2 |
| 5 | | phase plane analysis of linear/non-linear systems | 2 |
| 6 | | existence of limit cycles, jump phenomenon, stability analysis | 2 |
| | | | |
| 1 | UNIT-IVLyapunov Theory and Adaptive Control | Lyapunov direct method, positive definite functions and Lyapunov functions | 2 |
| 2 | | existence of Lyapunov functions, Lyapunov analysis of LTI systems | 1 |
| 3 | | variable gradient method, Krasvoskii method, performance analysis | 1 |
| 4 | | Popov's stability criteria. Introduction to basic approaches to adaptive control | 1 |
| 5 | | Model reference adaptive control systems | 2 |
| 6 | | self-tuning regulators, Applications of adaptive control | 3 |

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(Dr. Sudha.K)

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(Dr. Kusum Tharani)

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# Lesson Plan

**Subject Name:**-Artificial Intelligence    **Class:**- B.Tech CSE    **Subject Code:** ETCS310

**Department .:**- CSE    **Teaching Scheme:** - 3L+2T    **Total Lecture:** - 44

| S.NO. | Topics Details | No. Of Lecture Alloted |
|---|---|---|
| | **UNIT I** | |
| 1. | Introduction to Intelligent agents: Agents and Environment, Concept of Rationality, Structure and Type of Agent. | 1 |
| 2. | Problem-solving through AI: Problem formulation, uninformed search strategies, heuristics, and informed search strategies | 3 |
| 3. | Solving problems by searching, state space formulation, depth first and breadth-first search, Best First Search, A* Algorithm, AO* Algorithm | 4 |
| 4. | Constraint satisfaction Problem: Cryptarithmetic Puzzle | 2 |
| 5. | Iterative deepening, Means-End Analysis | 1 |
| | **UNIT II** | |
| 1. | Logical Reasoning: Logical agents, Knowledge-Based Agents, Logic | 2 |
| 2. | Propositional logic, inferences, First-order logic, inferences in first-order logic, Syntax and Semantics of FOL, | 4 |
| 3. | Propositional Vs First Order Logic. | 1 |
| 4. | Forward chaining, Backward chaining, | 2 |
| 5. | Unification, Resolution | 2 |
| | **UNIT III** | |
| 1. | Game Playing: Adversarial Search, Scope of AI -Games, Alpha Beta Pruning. | 3 |
| 2. | Theorem proving, Natural language Processing, Signification of NLP, Phases of NLP, Parsing Techniques: Top Down and Bottom up approach | 3 |
| 3. | Vision and Speech Processing, Robotics, | 2 |
| 4. | Expert systems, Inference Engine, Forward Chaining, Backward Chaining, Types of Expert System: Dendral, MyCin | 3 |
| 5. | AI techniques- search knowledge, abstraction | 1 |
| | **UNIT IV** | |
| 1. | Learning from observations: Inductive learning, learning Decision trees, Computational Learning theory, | 4 |
| 2. | Explanation based learning Applications: Learning using Relevance Information | 3 |
| 3. | Environmental Science, Robotics, Aerospace, Medical Sciences etc | 3 |

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Text Book:

[T1] Rich and Knight, ―Artificial Intelligence‖, Tata McGraw Hill, 1992

[T2] S. Russel and P. Norvig, ―Artificial Intelligence – A Modern Approach‖, Second Edition, Pearson Edu.


Reference Books:

[R1] KM Fu, "Neural Networks in Computer Intelligence", McGraw Hill

[R2] Russel and Norvig, "Artificial Intelligence: A modern approach", Pearson Education


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# Lesson Plan

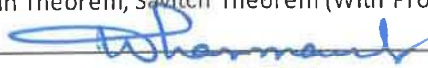**Subject Name:-** Theory of Computation    **Class:-** B.Tech CSE     **Subject Code:** CIC-206

**Department .:-** CSE     **Teaching Scheme:** - 4L+2T     **Total Lecture:** - 48

| S.NO. | Topics Details | No. Of Lecture Alloted |
|---|---|---|
| | **UNIT I** | |
| 1. | Introduction to Theory of Computation and terms like symbols, alphabets, strings. Uses and applications of Automata. | 1 |
| 2. | Introduction to languages & Chomsky Classification of Language. | 2 |
| 3. | Finite State Systems- Basic Definitions and finite automata DFA | 2 |
| 4. | Introduction to NFA, Difference between NFA and DFA. | 1 |
| 5. | Conversion of NFA to DFA, Equivalent states, Minimization of DFA. | 1 |
| 6. | Introduction to Regular Expressions, Algebraic Laws & Simplification of Regular expressions | 2 |
| 7. | Conversion of Regular expression to NFA, and Closure properties of Regular Languages. | 2 |
| 8. | Equivalence of DFA, NFA & regular expressions | 1 |
| 9. | Non regular languages and Pumping lemma for Regular Sets | |
| | **UNIT II** | |
| 1. | Grammar Introduction- Types of Grammars | 1 |
| 2. | Context Free Grammar and Language, Closure properties of CFL's | 1 |
| 3. | Introduction to Pushdown Automata PDA, Definitions and moves. Deterministic and Non-Deterministic PDA. | 3 |
| 4. | Construction of PDA & NPDA | 2 |
| 5. | Equivalence of CFG's and PDA's | 2 |
| 6. | Parsing and Construction of LL(K) Grammar | 2 |
| 7. | Pumping Lemma for Context free Languages and Problems on that. | 1 |
| | **UNIT III** | |
| 1. | Introduction to Turing Machines & Turing Machine Model | 2 |
| 2. | Variations of Turing Machines & Universal Turing Machine | 1 |
| 3. | Design & Techniques of Constructing Turing Machine | 1 |
| 4. | Equivalence of different Turing Machines | 1 |
| 5. | Halting Problem of Turing Machine | 1 |
| 6. | Introduction to Recursive & Recursively Enumerable Language and its Properties. | 1 |
| 7. | Decidable & Undecidable languages. Reducible Problems With Examples. | 2 |
| 8. | Post Correspondence Problem and Rice's Theorem & Church's Hypothesis | 2 |
| 9. | Introduction to Recursive Function Theory | 1 |
| 9 | | |
| | **UNIT IV** | |
| 1. | Introduction to Complexity Theory, Tractable and Intractable Problems | 1 |
| 2. | Classes of Problems:- Computational, Decision and Optimization Problems. | 1 |
| 3. | Class P, NP& co-NP Problem With Examples. | 2 |
| 4. | Polynomial Time Reductions, NP Complete & NP Hard Problem With Proves. | 2 |
| 5. | Cook-Levin Theorem, Savitch Theorem (With Proves) | 2 |

| 6. | PSPACE & NPSPACE Complexity Classes | 1 |
|----|-------------------------------------|---|
| 7. | Probabilistic Computation & BPP Class | 1 |
| 8. | Interactive Proof Systems and IP Class | 1 |
| 9. | Relativized Computation & Oracles. | 1 |

**, Textbook(s):**

[T1] J. Hopcroft, R. Motwani, and J. Ullman, Introduction to Automata Theory, Language and Computation, Pearson, 2nd Ed, 2006
[T2] Sipser, Michael. Introduction to the Theory of Computation, Cengage Learning, 2012.

**References:**

[R1] Peter Linz, An Introduction to Formal Languages and Automata, 5th edition, Viva Books, 2011.
[R2] J. C. Martin, Introduction to Languages and the Theory of Computation, TMH, 2nd Ed. 2004.
[R3] Maxim Mozgovoy, Algorithms, Languages, Automata, and Compilers, Jones and Bartlett, 2010.
[R4] D. Cohen, Introduction to Computer Theory, Wiley, N. York, 2nd Ed, 1996.
[R5] K. L. Mishra and N. Chandrasekharan, Theory of Computer Science: Automata, Languages and Computation, PHI, 2006.
[R6] Anne Benoit, Yves Robert, Frédéric Vivien, A Guide to Algorithm Design: Paradigms, Methods, and Complexity Analysis, CRC Press, 2013.

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# ACADEMIC PLAN FOR VII SEMESTER

**SUBJECT: Digital Control System**
**SUBJECT CODE: ICE-421T**
**TOTAL LECTURE CLASSES: 42**

**BRANCH: ICE (7th Sem)**
**CREDITS: 4**

| Sr. no | TOPICS TO BE COVERED | TOTAL NO. OF LECTURE |
|---|---|---|
| **FIRST TERM** | | |
| | **UNIT - I** | |
| 1 | Introduction to Discrete Time Control Systems | 2 |
| 2 | Digital control systems, Sampling Process and its Mathematical Analysis | 2 |
| 3 | Quantization, Data Acquisition, Mathematical Description of the Ideal Sampling Process-The Ideal Sampler | 2 |
| 4 | Construction of Sampled Signals, Data Reconstruction by Polynomial Extrapolation | 2 |
| 5 | Z-Transforms, Important properties and theorems of the Z-transform, Inverse Z-Transformation | 2 |
| 6 | Z-transform method for solving Difference Equations, The Limitations of Z-Transform Method, Modified z transform. | 2 |
| | **UNIT - II** | |
| 7 | Introduction to Z- plane Analysis of Discrete-Time control systems | 1 |
| 8 | Impulse sampling and Data Hold circuits, Block Diagram Analysis | 2 |
| 9 | Transfer Functions of Closed Loop Sampled Data Systems | 2 |
| 10 | Signal Flow Graphs of Sampled Data Systems | 2 |
| 11 | The pulse transfer function, Pulse transfer function of a digital PID controller | 2 |
| 12 | Realization of digital controllers and filters. | 1 |
| **SECOND TERM** | | |
| | **UNIT- III** | |
| 14 | Introduction to Design of Discrete Time control system by Conventional Methods | 2 |
| 15 | System characteristic equation, Time response, Mapping S-plane into Z-plane, Steady state accuracy | 2 |
| 16 | Stability Techniques, Bi-linear transformation, Routh Hurwitz Criterion, Jury stability test | 2 |
| 17 | Root locus, Nyquist criterion, Bode diagram, interpretation of frequency response, Closed loop frequency response | 2 |

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| 18 | State-Space Representations of Discrete-time system, Solving Discrete-time State space Equations | 2 |
|---|---|---|
| 19 | Pulse Transfer function matrix, Discretization of continuous- time state space equations | 2 |
| **UNIT – IV** | | |
| 20 | Introduction to Digital controller design | 2 |
| 21 | Control system specification, Compensation | 2 |
| 22 | Implementation of digital control systems using DSPs and Microcontrollers | 2 |
| 23 | Large-scale industrial applications using PLCs and SCADA, | 2 |
| 24 | Introduction to Discrete-event systems and Hybrid Systems | 2 |

**Text Books:**
[T1]    K. Ogata, "Discrete - Time Control Systems", PEARSON, 2007
[T2]    Benjamin C. Kuo, "Digital Control Systems", The Oxford Series in Electrical and Computer Engineering, 1995.

**Reference Books:**
[R1]    G. F. Franklin, J. D. Powell and M. L. Workman, Digital Control of Dynamic Systems, Pearson Education, 3rd Edition, 2000.
[R2]    Rashmi Vashisth, Kavita Singh, "Digital Control Systems", Galgotia Publications, 2013.
[R3]    M. Gopal, "Digital Control and State Variable Methods", Tata McGraw-Hill Education, 2009.

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# ACADEMIC PLAN FOR III$^{rd}$ SEMESTER

**SUBJECT: Engineering Electromagnetics**
**SUBJECT CODE: ICC-205**
**TOTAL LECTURE CLASSES: 46**

**BRANCH: ICE (3rd Sem)**
**CREDITS: 4**

| Sr. no | TOPICS TO BE COVERED | TOTAL NO. OF LECTURE |
|---|---|---|
| **First Term** | | |
| **UNIT - I** | | |
| 1 | Vector Algebra and vector calculus with significance of del operators-theorems and applications | 1 |
| 2 | Maxwell's Equations (for static, time ,time varying fields) in integral and differential forms | 1 |
| 3 | Continuity equation | 1 |
| 4 | Boundary conditions for electric magnetic fields | 1 |
| 5 | Programmatic solutions to Maxwell's equations using MATLAB | 1 |
| 6 | Poisson's and Laplace's equations. | 1 |
| **UNIT - II** | | |
| 7 | Electromagnetic waves: wave generation and equations in free space | 1 |
| 8 | Wave generation and equations in lossy and lossless dielectrics | 1 |
| 9 | Conductors skin depth – Plane wave reflection and refraction | 2 |
| 10 | Standing Wave – Applications | 1 |
| 11 | Wave propagation in lossless and conducting medium | 1 |
| 12 | Phase and Group velocity, Reflection by a perfect conductor | 1 |
| 13 | Insulator, Brewster Angle, surface impedance | 2 |
| 14 | Guided waves and flow of power: Poynting vector and Poynting theorem, applications, power less in a conductor. | 1 |
| **SECIND TERM** | | |
| **UNIT- III** | | |
| 15 | General solution for transmission lines – Equations of voltage and current, | 2 |
| 16 | Standing Waves and impedance transformation | 2 |
| 17 | Lossless and low-loss transmission lines | 1 |
| 18 | Meaning of reflection coefficient wavelength and velocity of propagation | 2 |

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| 19 | Distortion less transmission line | 2 |
|----|-----------------------------------|---|
| 20 | impedance matching – quarter wave | 2 |
| 21 | Single stub matching, double stub matching | 1 |
| 22 | Power transfer, Microstrip transmission line | 2 |
| 23 | Smith chart. | 1 |

| **UNIT – IV** | | |
|----|-----------------------------------|---|
| 24 | Rectangular waveguide | 2 |
| 25 | Characteristic of TE and TM waves-cutoff wavelength and phase velocity | 2 |
| 26 | Impossibility of TEM waves in waveguides-dominant mode | 2 |
| 27 | Surface currents, Attenuation, impedances | 2 |
| 28 | Circular wave guides-solution of field equations in cylindrical coordinates | 2 |
| 29 | TE and TM waves in circular guides – wave impedance and characteristic impedance | 1 |
| 30 | Microwave cavities: rectangular cavity resonators | 2 |
| 31 | Circular cavity resonators-Q-factor | 1 |
| 32 | Introduction to antenna: monopole and dipole antenna. | 1 |

**Textbooks:**

[T1]   Matthew N. O. Sadiku , ―Elements of Electromagnetics‖, Oxford University Press

[T2]   E. C. Jordon, K. G. Balman, ―Electromagnetic Waves & Radiation System‖ PHI – 2nd Edition

**Reference Books:**

[R1] William H. Hayt, ―Engineering Electromagnetics‖, TMH

[R2] J.D. Kraus, ―Electromagnetics‖, TMH

[R3] David K. Cheng,‖ Field and Wave Electromagnetic‖, 2nd Edition, Pearson Education Asia,2001

[R4] John R. Reitz, ―Foundations of Electromagnetic Theory‖. Pearson

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# ACADEMIC LESSON PLAN (2023)

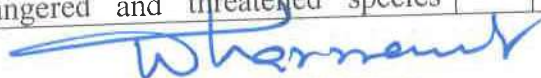## SUBJECT : ENVIRONMENTAL STUDIES

## SUBJECT CODE : BS -109

**Class :- ICE**

**Dept.:- Applied Sciences**

**Name of faculty :- Dr. Amreeta Preetam**

**Teaching Scheme :- 3L      Total Lecture :-36**

| S. No. | Topics detail | No. of Lectures | Reference Book Name with Chapter & Page No. | Date | Remarks |
|---|---|---|---|---|---|
| | Unit 1 Environmental Studies: Ecosystems, Bio-diversity and its Conservation | | | | |
| 1 | (i) The Multidisciplinary Nature of Environmental Studies-Definition, scope and importance of Environmental Studies. Biotic and a biotic component of environment, need for environmental awareness. | 1 | Environmental studies by Anindita Basak UNIT-I Page No. 1-8 | | |
| 2 | (ii) Ecosystems Concept of an ecosystem, structure and function of an ecosystem, producers, consumers and decomposers, energy flow in the ecosystem, ecological succession, food chains, food webs and ecological pyramids. | 2 | Environmental studies by Anindita Basak UNIT-III Page No. 47-55 | | |
| 3 | Introduction, types, characteristic features, structures and function of the following ecosystem: (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries), Biogeochemical cycles | 1 | Environmental studies by Anindita Basak UNIT-III Page No.59-67 | | |
| 4 | (iii) Bio-diversity and its Conservation Introduction to biodiversity - definition: genetic, species and ecosystem diversity, Biogeographical classification of India, Value of biodiversity: Consumptive use, productive use, social, ethical, aesthetic and option values. | 2 | Environmental studies by Anindita Basak UNIT-IV Page No.-75-80 | | |
| 5 | Biodiversity at global, national and local levels. India as a megadiversity nation, Hot-spots of biodiversity. | 1 | Environmental studies by Anindita Basak UNIT-IV Page No.-80-83 | | |
| 6 | Threats to biodiversity: Habitat loss, poaching of wildlife, man wildlife conflicts, rare endangered and threatened species | 1 | Environmental studies by Anindita Basak | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (RET)endemic species of India, method of biodiversity conservation: In-situ and ex-situ Conservation, Bioprospecting & Biopiracy | | UNIT-IV Page No.-83-98 | | | |
| 7 | Natural Resources Renewable and Non-renewable Natural Resources, Concept and definition of Natural Resources and need for their management. Forest resources, Water resources, Mineral resources, Energy resources, Land Resources, Food Resources | 2 | Environmental studies by Anindita Basak UNIT-II Page No.-15-26 Page No.27-41 | | | |

## Unit II: Environmental Pollution

| | | | | | | |
|---|---|---|---|---|---|---|
| 8 | (a) Air Pollution: Source, Types, effects on biosphere and Meterology, Air Quality, Control. | 2 | A Textbook of Environmental Studies By S Rattan, R Gadi and S. Mohapatra Page No. 189-219 | | | |
| 9 | (b) Water Pollution: Types and Sources. (h) Pollution Prevention, | 2 | A Textbook of Environmental Studies By S Rattan, R Gadi and S. Mohapatra Page No. 220 to 240 | | | |
| 10 | Soil Pollution: Types and Control. | 1 | A Textbook of Environmental Studies By S Rattan, R Gadi and S. Mohapatra Page No. 257 to 261 | | | |
| 11 | Noise Pollution: Effect, Control, Thermal Pollution., Radiation Pollution, Pollution Prevention | 1 | Environmental studies by Anindita basak Page. No 140 to 149 Page No. 166-167 | | | |
| 12 | Solid waste Management | 2 | Page. No. 250 to 257 | | | |
| 13 | Disaster Management | 2 | A Textbook of Environmental Studies By S Rattan, R Gadi and S. Mohapatra Unit 11, Page No 312-322 | | | |

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## Unit III Social Issues and Environment :

| | | | | | | |
|---|---|---|---|---|---|---|
| 14 | Concept of Sustainable Development; Urban problem related to energy; Water Conservation; Wasteland reclamation; | 2 | Environmental studies by Anindita Basak Page No 181-188 | | | |

| | | | | | |
|---|---|---|---|---|---|
| 15 | Resettlement and Rehabilitation; Climate Change | 2 | Page No 189-198 | | |
| 16 | Nuclear Accidents; Consumerism and Waste Products | 1 | Page No. 199-201 | | |
| 17 | Laws related to Environment and Pollution | 1 | Page No 202-204 | | |
| 18 | Laws related to Forest and Wild life | 1 | | | |
| 19 | Environmental Impact Assessment | 1 | A Textbook of Environmental Studies By S Rattan, R Gadi and S. Mohapatra Unit 13, Page No. 337-338 | | |
| Unit IV Human Population and Environment | | | | | |
| 20 | Population Growth | 2 | Environmental studies by Anindita Basak Page No. 219 to 221 | | |
| 21 | Human Rights | 1 | Page No.225 to 226 | | |
| 22 | Family Welfare Programmes | 1 | Page No. 222 to 223 | | |
| 23 | Environment and Human Health | 1 | Page No. 223 to 225 | | |
| 24 | HIV/AIDS | 1 | Page. No 226 to 228 | | |
| 25 | Women and Child Welfare | 1 | Page No. 228-229 | | |
| 26 | Role of IT. | 1 | Page No. 229-230 | | |

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