



**University School of Information Communication & Technology
Guru Gobind Singh Indraprastha University**

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IPU/USIC&T/2021/17111
16.12.2021

NOTICE

Sub: Sub-Committee of Academic Council Meeting of USIC&T held on 22.11.2021.


Reference as above and has approved by the Sub-Committee of Academic Council of USIC&T held on 22.11.2021, the following is detailed as below for information of all the concerned stakeholders:

1. Change of subject ID in respect of MCA (SE) Scheme 3rd Semester of USIC&T for paper Code MEES-611.

The Sub-Committee approved the change in subject ID in respect of MCA (SE) Scheme 3rd Semester of USIC&T for paper Code MEES-611, Paper ID 44727, Paper Name Environmental Studies (Detailed syllabus with modified paper code enclosed, as Annexure-I).

2. Modification in Paper ID: 44607, Paper Code – IT607, Paper: Data Structures Algorithms [MCA (SE) (1st Semester)] from Annual Year 2021-22.

The Sub-Committee approved for the same (Detailed syllabus with modifications are enclosed, as Annexure-II).


(Pravin Chandra)
Professor & Dean, USIC&T

Copy to:

1. All Faculty Members and Programme/Course In-charge(s) of USIC&T for information through email.
2. In-Charge, UITS with a request to upload the same on the University website.
3. Guard File.

GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI.

MCA(SE)

APPLICABLE FROM A.S. 2020-21

Paper ID: 44727

Code: MEES611

Paper: Environmental Studies

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INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.

2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks

Course Outcomes:

CO 1	Environmental Studies course will provide necessary information and knowledge about the various aspects of environment, ecosystems and related biodiversity.
CO 2	Students will be able to learn and understand about the availability and sustainable use of resources, environmental problems and their short term and long term impacts on humans.
CO 3	Course will help them to learn about environmental policies and protocols social issues and role of human in conservation and protection of environment.
CO 4	Overall, course will help students to develop skills and ability of understanding environment- human relationship.

Course Outcomes -Program Outcomes Matrix
Filled on a scale of 1 to 3 (3=High, 2=Moderate; 1=Low; '-' for no correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	-	-	-	-	-	-	-	-	-	-	-	-
CO 2	-	-	-	-	-	1	-	-	-	3	-	-
CO 3	-	-	-	-	-	1	-	-	-	3	-	-
CO 4	-	-	-	-	-	1	-	-	-	3	-	-

Unit I: Fundamentals:

(8 hours)

The Multidisciplinary nature of environmental studies: Definition, scope and importance, need for public awareness;

Ecosystems: Structure and function of an ecosystem, energy flow in ecosystems, food chain, food web, ecological pyramids, ecological succession; Introduction to types & characteristics

Biodiversity: Introduction to biodiversity-definition, genetics, species, ecosystem diversity, value of biodiversity-consumptive uses, productive, social, ethical, aesthetic and option values, biodiversity at global and national level, hot spots of biodiversity in India, threats to biodiversity, in-situ and ex-situ conservation.

Unit II: Renewable and non renewable resources:

(5 hours)

Energy resources: Growing energy needs, renewable and non renewable energy sources, sustainable development

Water Resources: Use and over-utilization of surface and ground water, conflicts over water

Forest resources: Use and over-exploitation, deforestation, case studies

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources

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Food resources: World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture.

Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

Unit III: Environmental Pollution:

(6 hours)

Air Pollution: Types of pollutants, sources, effects & control of air pollutants.

Water Pollution: Classification of Pollutants, their sources, waste water treatment

Soil Pollution: Composition of soil, classification and effects of solid pollutants and their control.

Solid Waste Management: Classification, waste treatment and disposal methods; composting, sanitary land filling, thermal processes, recycling and reuse methods.

Hazardous wastes - Classification, treatment and disposal processes.

Marine Pollution: Causes, effects and control of marine pollution, coastal zone management.

Unit IV: Environmental Policies, Human Population and Environment

(6 hours)

Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents, Environmental Impact Assessment; Kyoto and Montreal Protocol, Some important Environmental laws, Green bench; population growth and variation among nations, environment and human health, Role of government and non government organizations in environment improvement.

Field work:

(equal to 2 hours)

visit to local areas to document environmental assets and study of simple ecosystems.

Suggested Readings and References:

1. A textbook of environmental studies, R. Gadi, S. Rattan, S. Mohaptra, Kataria Publication, 2014.
2. Elements of environmental sciences & engineering, P. Meenakshi, PHI Learning Pvt Ltd, 2014.
3. Basics of Environment and Ecology, A. Kaushik & C.P. Kaushik, New Age International Publishers, 2010.
4. Fundamental concepts in environmental studies, D.D. Mishra, S Chand & Co. Ltd., 2008.
5. Textbook of environmental studies, E. Barucha, UGC, 2005.
6. Environmental studies, B. Joseph, Tata McGraw-Hill Publishing Company Ltd., 2005.

Note: This paper is approved by the board of studies of University School of Environment Management.

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Paper ID: 44607

Code: IT607 Paper: Data Structure and Algorithm

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INSTRUCTIONS TO PAPER SETTERS:

Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
 Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks

Course Outcomes:

CO 1	To be able to understand the difference between data structure and structured data with few preliminary examples such as stack, queue and link list
CO 2	To be able to model different types of trees, balance trees and graphs
CO 3	To have a knowledge and ability to analyze the time/ space complexity and understanding different kinds of searching/ sorting algorithms
CO 4	To get equipped with the knowledge of dynamic paradigm, greedy paradigm and idea of NP complete problems.

Course outcomes mapping with Programme specific outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO8	PO9	PO1 0	PO1 1	PO12
CO1	3	3	3	3	3	-	3	2	-	-	2	1
CO2	3	3	3	3	3	-	3	2	-	-	2	1
CO3	3	3	3	3	3	-	3	2	-	-	2	1
CO4	3	3	3	3	3	-	3	2	-	-	2	1

UNIT - I

Introduction to data structures, arrays and its applications, Sparse Matrix, singly linked lists, doubly linked lists, circular list, Implementation of stacks and queues using arrays and linked lists, circular queues, applications of stack and queue.

UNIT - II

Trees, Binary Tree, terminology, representation, Binary Search tree (insertion, deletion and different traversals techniques), AVL Trees, B tree, B+ trees, Data Structure for Sets, disjoint sets implementation Graph Algorithms: Terminology, Representation, Graph traversals, Breadth-First Search, Depth-First Search, Shortest Paths, Minimum Spanning Trees.

UNIT - III

Notion of Algorithm, Growth of functions, Use of Big O, Θ etc. in analysis, Summations, Recurrences: The substitution method, The iteration method, The master method, Searching Techniques: Sequential Search Binary Search, hashing

Approved in the 55th BoS of USIET on 31-10-2021.
w.e.f 2021 onwards for MCA (SE) 1st semester

Approved by AC Subcommittee: 22/11/2021



Sorting techniques: Insertion Sort, Divide and conquer Paradigm of Problem solving (Merge sort, Quick Sort), Priority Queues implementation using Heap, sorting in linear time (count sort, radix sort, bucket sort).

UNIT – IV

Design Techniques with examples: Dynamic Programming, Greedy Algorithms, Concepts of P, NP and NP hard and NP complete Class Problems; NP-completeness and Reducibility, Introduction to the concepts of Approximation Algorithms.

Textbook(s):

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Learning Pvt. Ltd. (Originally MIT Press); Third edition (February 2, 2010)
2. Ellis Horowitz, Sartaj Sahni, Anderson-Freed, Fundamentals of Data Structures in C, Second Edition, 2008, University Press
3. Ellis Horowitz, Sartaj Sahni, S. Rajeshkaran, Fundamentals of Computer algorithm, University Press, Jan 2008,

References:

1. R.Kruse, C.L. Tondo, BP Leung, Shashi M, "Data Structures and Program Design in C", Second Edition, Pearson Education.
2. Jon Kleinberg and Eva Tardos, "Algorithm Design", Pearson Edition, 2006.
3. Sanjoy Dasgupta, . "Algorithms", Christos Papadimitriou Umesh Vazirani TMH
4. A.S.Tanenbaum, Y. Langsam, and M.J. Augenstein, "DataStructures Using C", Pearson Education
5. B.W. Kernighan, Dennis M.Ritchie, "The C Programming Language", Pearson Education
6. S. Sahni and E. Horowitz, "Data Structures", Galgotia Publications.
7. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 2003.
8. Kamthane, "Introduction to Data Structure in C", Pearson Education
9. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education
10. Sara Baase and Allen Van Gelder, "Computer Algorithms - Introduction to Design and Analysis", Pearson Education
11. B.A. Forouzan and R.F. Gilberg, "Computer science, a structured programming approach using C", Third edition, Cengage Learning.
12. A.V.Aho, J.E. Hopcroft and J.D.Ullman, "The Design and Analysis Of Computer Algorithms", Pearson Education
13. Seymour Lipschutz, Data Structures, Schaum Series, Mc Graw Hills

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22/11/2021

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