**M. C. E. Society's**
**Abeda Inamdar Senior College**
Of Arts, Science and Commerce, Camp, Pune-1
(Autonomous) Affiliated to Savitribai Phule Pune University
NAAC accredited 'A' Grade

**Program Objectives:**

1. To develop conscience towards social responsibility, human values and sustainable development through curriculum delivery and extra-curricular activities
2. To develop scientific temperament with strong fundamental knowledge of the subject
3. To develop analytical thinking and problem-solving skills needed for various entrance and competitive examinations and Post Graduate Studies
4. To train students in laboratory skills and handling equipment along with soft skills needed for placement

**Program Outcomes:**

1) The students will graduate with holistic development.
2) The students will be qualified to continue higher studies in their subject.
3) The students will be eligible to appear for various competitive examinations and pursue higher education.
4) The students will be able to apply for the jobs with a minimum requirement of B. Sc. Program.

**Program Specific Objectives and Outcomes**

**Program Specific Objectives:**

The B.Sc. Environmental Science Program will enable the students;

PSOB-1. To develop basic understanding of Fundamentals of Environmental Science as a discipline.

PSOB-2. To bring sensitization towards the environment and also increase student competency & employability.

PSOB-3. To inculcate a sense of responsibility among students about various principles and laws of environment

PSOB-4. To encourage students about applicability of knowledge and Interdisciplinary approach in day todays life.

**Program Specific Outcomes:**

After successful completion of B.Sc. Environmental Science Course, student will have:

PSOC-1. Fundamental and Advanced knowledge of theory and practical courses in Environmental science.

PSOC-2. Students will understand about how the subject knowledge helps in solving various social, economic and environment related problem

PSOC-3. Knowledge about various Environmental laws, ISO series, EMS, Standards and Ethics required to peruse higher education in the field.

PSOC-4. Knowledge about Environmental (Resource, Energy) Management, Monitoring, introductory aspects of Environmental Biotechnology and Microbiology

PSOC-5. Skills in laboratory techniques and experience in instrument handling

**M. C. E. Society's**
**Abeda Inamdar Senior College**
Of Arts, Science and Commerce, Camp, Pune-1
(Autonomous) Affiliated to Savitribai Phule Pune University
NAAC accredited 'A' Grade

**Syllabus for F.Y.B. Sc. Environmental Science**

**2021-22 (CBCS – Autonomy 21 Pattern)**

| | |
|---|---|
| **Course/ Paper Title** | Fundamentals of Environmental Biology |
| **Course Code** | 21SBEV111 |
| **Semester** | I |
| **No. of Credits** | 2 (36 Lectures of 50 minutes) |

**Aims & Objectives of the Course**

| Sr. No. | Objectives |
|---|---|
| **1.** | To ensure 'well variedness' with the basic, scientific concepts of Environmental Biology |
| **2.** | To encourage incitation of a thought process related to Evolution of life |
| **3.** | To bring sensitization towards the environment and also increase student competency & employability. |
| **4.** | To inculcate sense of Scientific Temperament among students |
| **5.** | To inculcate the laws of Nature and to maintain the harmonious relationship with it. |

**Expected Course Specific Learning Outcomes**

| Sr. No. | Learning Outcome |
|---|---|
| **1.** | Students will understand the multidisciplinary nature of the subject and thus the Scope of study |
| **2.** | Students will understand the importance of biology from environmental point of view in day todays life |
| **3.** | Students will understand how evolution has played important role in shaping and making Life possible on Earth |

| | |
|---|---|
| **4.** | Students will understand about Taxonomy, Ecological Adaptations, Significances / use of the Bio resources and role of micro-organisms in environment. |

**Syllabus**

| Unit No. | Title with Contents | No. of Lectures |
|---|---|---|
| **I** | **Environmental Biology and Biogeography**<br>1. Introduction to Biology, Branches, Scope and Importance in today's context from environmental point of view.<br>2. Charles Darwin's Voyage of HMS Beagle His theory of 'Survival of the Fittest'.<br>3. Biological diversity of Biogeography – The meaning; Biographical profile of the world; The physical, microbial, floral and faunal characteristics of each Bio geographical zone | **06** |
| **II** | **Origin of Life**<br>1. The origin of Life; Evolution of Life through<br>a. the geological time i.e. – Eras, Periods, Epochs<br>2. Events of (Evolutionary) 'Explosions' and 'Mass Extinctions'& Paleontological Evidences for these.<br>3. The current 'Mass Extinction' with reference to rate of<br>a. extinction, factors responsible and possible remedies | **06** |
| **III** | **Taxonomy**<br>1. Taxonomic Principles - aim, objectives, hierarchy, kingdoms.<br>2. History; Linnaeus system of classification; Bentham &<br>3. Hooker system of classification.<br>4. Components of systematic - characterization,<br>a. Classification, identification & nomenclature.<br>The concept of species- morphological, biological, | **06** |

| | | |
|---|---|---|
| | phylogenetic, ecological etc. | |
| **IV** | **Ecology and Bio-resources**<br>1. Ecological Adaptations under various environmental conditions –<br>i. In plants - Hydrophytes, Mesophytes, Epiphytes, Xerophytes & Halophytes<br>ii. In animals - mimicry, vestigiality etc.<br>2. Bio-resources---<br>i. Forests- major types of the world & India<br>ii. Agricultural crops - major food plants of the world & India<br>iii. Livestock – major varieties of the world & India<br>iv. Fisheries resources - saline & fresh water<br>3. Significances / use of the Bio resources; Harnessing / Optimum use of Bio resources by traditional & modern methods; Threat to local bio resources - overexploitation, habitat loss, invasive species etc. | **12** |
| **V** | **Environmental Microbiology and Biotechnology**<br>1. Scope and Importance of Environmental Microbiology<br>2. Microbes in the various segments of environment—Beneficial and Harmful, Case studies—Corona Virus<br>3. Introduction to Environmental Biotechnology<br>4. Genes and Chromosomes—Role in Diversity<br>5. Applications | **06** |

**References:**

1) **‘**A Textbook of Plant Ecology’ Ambashta R.S. &Ambashta N.K (1999) CBS Publ. & Distributers, New Delhi

2) ‘Ecology: Principles and Applications’ Chapman J.L. & Reiss M.J. (1995) Cambridge University Press

3) ‘Environmental Science: A Global Concern’ Cunningham W.P. & Saigo S.W. (1997) WCB, McGraw Hill
4) ‘Elements of Ecology’ Sharma P.D. Rastogi Publication
5) ‘Environmental Science’ Tyler M.G. Jr. (1997) Wadsworth Publ. Co.
6) ‘Environmental Studies’ Benny Joseph (2005) Tata McGraw Hill Publ. Co. Ltd.
7) ‘Patterns in the Living World’ – Biology-an Environmental approach, John Murray, London
8) ‘Diversity Among Living Things’ Biology-an Environmental approach, John Murray, London
9) ‘Paleobotany and the Evolution of Plants’ Wilson N. Stewart (1983) Cambridge University Press
10) Biological science, D. J. Taylor, N.P.O. Green & G.W Stout, Cambridge Low Price Edition, 3rdEdtn.
11) Holmes’ Principles of Physical Geology, Edt. By P. McL. D. Duff, ELBS with Chapman & Hall, 4thEdtn.
12) An Advanced textbook on Biodiversity – Principles & Practice, K. V. Krishnamurthy, Oxford & IBH Publishing Co. Pvt. Ltd., Special Indian Edtn

**M. C. E. Society's**
**Abeda Inamdar Senior College**
Of Arts, Science and Commerce, Camp, Pune-1
(Autonomous) Affiliated to Savitribai Phule Pune University
NAAC accredited 'A' Grade

**Syllabus for F.Y.B.Sc. Environmental Science**

**2021-22 (CBCS – Autonomy 21 Pattern)**

| | |
|---|---|
| **Course/ Paper Title** | Fundamentals of Environmental Chemistry |
| **Course Code** | 21SBEV112 |
| **Semester** | I |
| **No. of Credits** | 2 (36 Lectures of 50 minutes) |

**Aims & Objectives of the Course**

| Sr. No. | Objectives |
|---|---|
| **1.** | To enlighten the students with the basic concepts of Environmental Chemistry. |
| **2.** | To familiarize students with the concept like green chemistry and Climate change |
| **3.** | To learn the basics of environmental analysis techniques. |
| **4.** | To know the impacts of food adulterants on health |
| **5.** | To correlate the study of chemical reactions and the movement of various nutrients among components of environment |

**Expected Course Specific Learning Outcomes**

| Sr. No. | Learning Outcome |
|---|---|
| **1.** | Students will understand the importance of Chemistry in day todays life |

| | |
|---|---|
| **2.** | Students will familiarize with the various chemical reactions occurring in atmosphere. |
| **3.** | Students will understand Water Quality and Standards and Industrial and Domestic waste water treatment process |
| **4.** | Students will understand about the impact of heavy metals on health and also about Plastic toxicity |

**Syllabus**

| Unit No. | Title with Contents | No. of Lectures |
|---|---|---|
| **I** | **Introduction**<br>1. Definition and Concept<br>2. Scope of Environmental Chemistry.<br>3. Segments of Environment and various interactive reactions occurring between these segments.<br>4. Concept of Bio-geo-chemical cycles<br>5. Concept of Green Chemistry and its applications | **06** |
| **II** | **Chemistry of Atmosphere**<br>1. Characteristic of the Chemical Reactions involved in atmosphere.<br>2. Classification of Air Pollutants- Primary and Secondary<br>3. Photochemical smog<br>4. Chemistry of NOx, Sox, Carbon oxides<br>5. Plume behaviour<br>6. Introduction to Climate Change in Atmosphere and Paris agreement | **08** |
| **III** | **Chemistry of Water**<br>1. Properties of Water<br>2. Water Quality and Standards<br>3. Hydrogen Bonding in Water | **06** |

| | | |
|---|---|---|
| | 4. Solubility Rules of water<br>5. Surfactants and their types | |
| **IV** | **Environmental Analysis**<br>1. Solution concentration (Normality, Molarity, Molality, ppm, Equivalent weight etc.)<br>2. Titrimetric methods.<br>3. Basic Principle and working of pH meter and conductivity meter.<br>4. Beer – Lamberts law<br>5. Introduction to Analysis of waste water | **08** |
| **V** | **Chemical Toxicology**<br>1. Toxicity of Pb, Hg, Cd, As on human health, prevention and Control methods<br>2. Food additives and contaminants<br>3. Preservatives, flavoring agents, coloring agents, food adulterants properties and their effects | **08** |

**References:**


1. Environmental Chemistry, A. K. De, New Age International Publishers, 7thEdtn.
2. Elements of Environmental Chemistry, H. V. Jadhav, Stosius Incorporated/Advent Books Division, 1992
3. Environmental Chemistry, H. Kaur, A Pragati Edtn., 2ndEdtn. (2007)
4. Environmental Chemistry, S. K. Banerjee, PHI Learning Pvt. Ltd., 2nd Edtn.
5. Forinash K.2010.Foundation of Environmental Physics, Island Press

**M. C. E. Society's**
**Abeda Inamdar Senior College**
Of Arts, Science and Commerce, Camp, Pune-1
(Autonomous) Affiliated to Savitribai Phule Pune University
NAAC accredited 'A' Grade

**Syllabus for F.Y.B. Sc. Practical Course on Environmental Biology and Chemistry**
**2021-22 (CBCS – Autonomy 21 Pattern)**

| | |
|---|---|
| **Course/ Paper Title** | Practical Course on Environmental Biology and Chemistry |
| **Course Code** | 21SBEV113 |
| **Semester** | I |
| **No. of Credits** | 1.5 (46.8 Lectures of 50 minutes) |

**Syllabus**

| Unit No. | Title with Contents | Practical Sessions |
|---|---|---|
| **1** | Laboratory safety rules and introduction to laboratory equipment's | 01 |
| **2** | Collection and preservation of water and soil samples (Field Practical). | 02 |
| **3** | Determination of pH and Electrical Conductivity of Water and Soil samples | 01 |
| **4** | Introduction to Use of software's to calculate Air and Water Carbon Footprint | 01 |
| **5** | Determination of Alkalinity from water sample | 01 |
| **6** | Determination of Total Hardness (Ca & Mg) from water. | 01 |
| **7** | Determination of Chlorides from water. | 01 |
| **8** | Determination of TDS, TSS & TS from water | 01 |

| | | |
|---|---|---|
| **9** | Identification of Food adulterants in various food samples | 01 |
| **10** | Identifying native plants for plantation with respect to Geography and Climate | 01 |
| **11** | Study of the working of PUC machine-Gas Analyser (Demonstration). | 01 |
| **12** | Study of Plant / Animal Fossil Forms from different geological periods/visit to Palaeo-botanical museum | 01 |
| **13** | Study of Plant Adaptations under various environmental conditions<br>(Hydrophytes, Mesophytes, Epiphytes, Halophytes & Xerophytes). | 01 |
| **14** | Study of Animal Adaptations under various ecological conditions | 01 |
| **15** | Visit to study different Fishery resources in the local market | 01 |
| **16** | Visit to study and Inventarise the various Agricultural/ Horticultural resources in the local market | 01 |

**References:**


1. S.K. Maiti, Handbook of methods in Environmental Studies Vol—I & II, ABD Publishers, Jaipur, India
2. Manivaskam, N,Physico-Chemical Examination of water, sewage and industrial effluents, Pragti Prakashan, Meerut, 1984
3. Trivedi, R.K. and Goel, P.K, Chemical and biological method for water pollution studies. Environment Publications, Karad, 1986
4. Willard, Instrumental methods of analysis, cbspd; 7thEdtn

**M. C. E. Society's**
**Abeda Inamdar Senior College**
Of Arts, Science and Commerce, Camp, Pune-1
(Autonomous) Affiliated to Savitribai Phule Pune University
NAAC accredited 'A' Grade

**Syllabus for F.Y.B. Sc. Environmental Science**

**2021-22 (CBCS – Autonomy 21 Pattern)**

| | |
|---|---|
| **Course/ Paper Title** | Fundamentals of Environmental Geosciences |
| **Course Code** | 21SBEV121 |
| **Semester** | II |
| **No. of Credits** | 2 (36 Lectures of 50 minutes) |

## Aims & Objectives of the Course

| Sr. No. | Objectives |
|---|---|
| **1.** | To ensure 'well variedness' with the basic, scientific concepts of many of the current environmental issues & happenings |
| **2.** | To encourage incitation of a thought process & hence, development of a practical perspective amongst the students |
| **3.** | To bring sensitization towards the environment but also increase student competency & employability. |
| **4.** | To inculcate sense of Scientific Temperament |
| **5.** | To inculcate the laws of Nature and to maintain the harmonious relationship with it. |

## Expected Course Specific Learning Outcomes

| Sr. No. | Learning Outcome |
|---|---|
| **1.** | Students will understand the multidisciplinary nature of the subject and the basics of Geosciences |

| | |
|---|---|
| **2.** | Students will come to know the importance of the subject in day today's life, thus understanding the basics of sustainability |
| **3.** | Students will be able to enumerate the intricate relationship between all type's life and the present trend of man – environment relationship |
| **4.** | Students will understand about how the subject knowledge helps in solving various social, economic and environment related problems |

**Syllabus**

| Unit No. | Title with Contents | No. of Lectures |
|---|---|---|
| **I** | **Earth & it's Structural Components**<br>1. Solar system formation and planetary differentiation<br>2. Internal Structure of Earth<br>3. Theories of geological evolution – Wagener's Continental Drift Theory, Plate Tectonic Theory<br>4. Major changes on the Earth's surface Geological time scale<br>5. Introduction—Indian Mountain system, Indo-Gangetic plains, Geology of Himalayan ecosystem and Western Ghats<br>6. Types of Rocks – Igneous, Sedimentary, Metamorphic, Rock cycle | **10** |
| **II** | **Soil**<br>1. Formation – weathering processes (types)<br>2. Physical & chemical properties<br>3. Macro & Micro plant nutrients, their role<br>4. Soil Profile, types<br>5. Soil classification<br>6. Soils of India – with respect to their agriculture significances.<br>7. Importance and Significance of Soil | **08** |

| | | |
|---|---|---|
| | 8. Soil erosion, Types, Causes and Effects | |
| **III** | **Earth's Atmosphere and Atmospheric temperature**<br>1. Introduction, Evolution of atmosphere<br>2. General properties<br>3. Vertical structure<br>4. Chemical composition – in each of the vertical<br>a. layers; past & present Significance<br>5. Atmospheric temperature measurement – Instruments, Methods (maximum, minimum, mean<br>a. temperature, temperature range);<br>6. Factors regulating atmospheric temperature<br>7. Lapse rate; Types – ELR, DALR & WALR<br>8. Concept of Temperature Inversion<br>9. Urban Heat Island Effect<br>10. Land - Sea breeze effect | **08** |
| **IV** | **Hydrological cycle &Atmospheric pressure**<br>1. Hydrological cycle –<br>i. Introduction & significance<br>ii. Evaporation; Factors affecting the rate of Evaporation<br>iii. Condensation; Factors affecting, forms of condensation – dew, frost, fog & cloud.<br>iv. Precipitation; Factors affecting and Forms of precipitation – rain, drizzle, snow, hail, sleet<br>2. Atmospheric pressure –Introduction; Measurement; Factors affecting the atmospheric pressure, Isobars<br>3. Atmospheric pressure & Generation of winds; Factors affecting winds | **04** |
| **V** | **Natural Calamities** | **06** |

| | | |
|---|---|---|
| | 1. Natural Calamities – Volcanoes, Earthquakes, Landslides, Cyclones, Floods, Droughts, Wild Forest fires ---their origin, Causes, Effects<br>2. Human Interference in triggering disasters<br>3. Planning & Management to prevent/mitigate their effects;<br>4. Case studies for each.<br>5. Government Departments / Agencies to manage Natural Disasters | |

**References:**


1) Environmental Geology; Valdiya K.S.; Indian Context. Tata McGraw Hill

2) Essentials of Climatology; D. S. Lal; Chaitanya Publishing House, Allahabad, 1989.

3) Holmes' – Principles of Physical Geology; Edt. by P. McL. D. Duff; ELBS Chapman & Hall Low Priced Edtn; 4thEdtn.

4) A Textbook of soil Science; T.D. Biswas& S.K. Mukharjee; Tata McGraw-Hill Education

5) Introductory Soil Science; Dilip Kumar Das; Kalyani Publishers; 2ndEdtn.

6) Environmental Geology; Kellar E.A. (2011); Prentice Hall, 624 p; 9thEdtn.

**M. C. E. Society's**
**Abeda Inamdar Senior College**
Of Arts, Science and Commerce, Camp, Pune-1
(Autonomous) Affiliated to Savitribai Phule Pune University
NAAC accredited 'A' Grade

**Syllabus for F.Y.B. Sc. Environmental Science**

**2021-22 (CBCS – Autonomy 21 Pattern)**

| | |
|---|---|
| **Course/ Paper Title** | Fundamentals of Environmental Pollution |
| **Course Code** | 21SBEV122 |
| **Semester** | II |
| **No. of Credits** | 2 (36 Lectures of 50 minutes) |

**Aims & Objectives of the Course**

| Sr. No. | Objectives |
|---|---|
| **1.** | To bring awareness about major types of pollution and the control measures of each |
| **2.** | To inculcate a sense of responsibility among students about various principles of environment |
| **3.** | To make them understand about recent pollution related case studies |
| **4.** | To find new sustainable ways to protect the mother Earth |
| **5.** | To encourage students about applicability of knowledge in day todays life. |

**Expected Course Specific Learning Outcomes**

| Sr. No. | Learning Outcome |
|---|---|
| **1.** | Students will understand the impact of human activities on various |

| | |
|---|---|
| | resources of environment through case studies |
| **2.** | Students will learn about various types of pollution, its impact and control measures. |
| **3.** | Students will correlate about how the subject knowledge helps in solving various social, economic and environment related problems |
| **4.** | Students will be empowered with recent technologies that are ecofriendly and can help them to be the entrepreneurs |

**Syllabus**

| Unit No. | Title with Contents | No. of Lectures |
|---|---|---|
| **I** | **Introduction**<br>1. Pollution – Definitions<br>2. Types –Air, Water Soil, Noise, Thermal, Radioactive and Solid waste<br>3. Natural and Anthropogenic sources<br>4. Introduction to Solid waste and Plastic pollution- A case study<br>5. Introduction to Plastic Toxicity—micro plastic in food chain | **04** |
| **II** | **Air Pollution**<br>1. Definition; Major air pollutants and their sources;<br>2. Effects –<br>i. On Biological systems– Animals, Humans & Plants<br>ii. On Non-Biological systems – material; physical environment<br>3. Green House Effect, Ozone layer depletion, Smog, Acid Rain, Global warming<br>4. Case studies – London smog; Los Angeles smog; Taj-Mahal, Asian Brown Cloud, Delhi Air pollution | **08** |

| | | |
|---|---|---|
| | 5. Current Air pollution scenario of Indian cities | |
| **III** | **Water and Thermal pollution**<br>1. Definition, Types (Ground, Surface and Marine) Sources, Effects & control measures<br>2. Detergent – Eutrophication<br>3. Pesticide – Bioaccumulation, Biomagnification<br>4. Case studies – Itai- Itai & Minamata (Japan); Arsenic poisoning (West Bengal) etc.<br>5. Definition, Sources, Effects and Control measures of Thermal pollution | **08** |
| **IV** | **Soil pollution**<br>1. Definition; Sources/ routes of contamination<br>2. Effects –On soil quality/ productivity.<br>3. On Biological system – on soil microorganisms, on Plants, Animals<br>4. Control measures/ Alternatives –<br>i. Bio fertilizers & biological pest management;<br>ii. Organic farming & other agricultural interventions;<br>iii. Appropriate irrigation & drainage techniques;<br>iv. Lime& gypsum application. Case studies – Declining soil productivity in the Punjab &Haryana;<br>v. Desertification in India, Western Maharashtra | **08** |
| **V** | **Noise Pollution**<br>1. Definition, Introduction<br>2. Sources, Measurement, Instrument, Permissible limits, Categories/ Zones in context to noise level | **08** |

| | | |
|---|---|---|
| | 3. Effects—Auditory and Non- Auditory—on Living and non –living things<br>4. Control measures—at Individual level, Institute level, Commercial level, industrial level<br>5. Concept of Noise barriers—Control at Source level, Receiver level, Control during Transmission path<br>6. Case studies related | |

**References:**


1) Air Pollution- M. N. Rao & H. V.N. Rao; Tata McGraw Hill, New Delhi, 1989.

2) "Environment Pollution Control and Environmental Engg." C. S. Rao, Tata McGraw Hill, New Delhi, 1994.

3) Soil pollution & Soil Organism - P.V. Mishra

4) Water Pollution—A.K. Tripathy& S.N. Pandey; A. P. H. Publishing Corporation

5) Environmental Air pollution & it's control—G.R. Chatwal; Anmol Publications, New Delhi, 1989

6) Environmental Chemistry; A. K. De; New Age International Publishers; 6thEdtn.

7) Understanding Environment; Edt by Kiran B. Chhokar, Mamata Pandya, Meena Raghunathan; Centre for Environment Education; Sage Publication.

8) Perspective in Environmental Studies; Kaushik &Kaushik; New Age International Pvt. Ltd Publishers

9) Environmental Science; S. C. Santra; New Central Book Agency (P) Ltd.; 2ndEdtn.

10) Water Pollution, P.K. Goel, New Age International, 2006 Revised Edtn

**M. C. E. Society's**
**Abeda Inamdar Senior College**
Of Arts, Science and Commerce, Camp, Pune-1
(Autonomous) Affiliated to Savitribai Phule Pune University
NAAC accredited 'A' Grade

**Syllabus for F.Y.B.Sc. Practical Course on Environmental Geosciences and Pollution**
**2021-22 (CBCS – Autonomy 21 Pattern)**

| | |
|---|---|
| **Course/ Paper Title** | Practical Course on Environmental Geosciences and Pollution |
| **Course Code** | 21SBEV123 |
| **Semester** | II |
| **No. of Credits** | 1.5 (46.8 Lectures of 50 minutes) |

**Syllabus**

| Unit No. | Title with Contents | Practical Sessions |
|---|---|---|
| **1** | Measurement of Noise using Sound Level Meter (Field Practical). — (Degree of Annoyance measurement) | 01 |
| **2** | Collection and characterization of planktons as bio-indicators from Eutrophic Lake (Field Practical). | 01 |
| **3** | Identification of different Rock specimens from their physical properties. | 01 |
| **4** | Identification of different Mineral specimens from their physical properties | 01 |
| **5** | Visit to a Natural Area/ Wildlife Sanctuary/ National Park | 01 |
| **6** | Visit to Weather Station. | 01 |

| | | |
|---|---|---|
| **7** | Determination of Turbidity in water by **Secchi disc** (Field practical—Traditional method) and by Nephalo turbido meter<br>(Digital Instrument) | 01 |
| **8** | Reading Topographic Maps and Symbols | 01 |
| **9** | Visit to Industrial Site/ ETP/ STP | 01 |
| **10** | Visit to Garbage Disposal site / Solid Waste management Site | 01 |
| **11** | Determination of Water Holding Capacity of soil | 01 |
| **12** | Study of soil properties – Temperature, texture and particle size | 01 |
| **13** | Introduction to Study of Wind Rose | 01 |
| **14** | Estimation of the Moisture Content of soil | 01 |
| **15** | Use of social media for e-networking and dissemination of ideas on environmental issues | 01 |
| **16** | Estimation of Lapse Rate from given data | 01 |

**References:**


1. S.K. Maiti, Handbook of methods in Environmental Studies Vol—I & II, ABD Publishers, Jaipur, India
2. Manivaskam, N,Physico-Chemical Examination of water, sewage and industrial effluents, Pragti Prakashan, Meerut, 1984
3. Trivedi, R.K. and Goel,P.K, Chemical and biological method for water pollution studies. Environment Publications, Karad, 1986
4. Willard, Instrumental methods of analysis, cbspd; 7thEdtn