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| **Course Code** | **Course Title** | | | | | | | |
| **2USHY06** | Introduction to Environmental Pollution | | | | | | | |
|  | **TH** | | | **P** | | **TUT** | | **Total** |
| **Teaching Scheme (Hrs.)** | **02** | | | **--** | | **--** | | **02** |
| **Credits Assigned** | **02** | | | **--** | | **--** | | **02** |
| **Examination Scheme** | **Marks** | | | | | | | |
| **CA** | | **ESE** | **TW** | **O** | **P** | **P&O** | **Total** |
| **ISE** | **IA** |
| **30** | **20** | **--** | **--** | **--** | **--** | **--** | **50** |

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| **Course prerequisites: Nil**  **Course Objectives:**  This course initially focuses on various air pollutions and their formation mechanism and effect of noise on air pollution. In the second stage this course Emphasis on pollutant dispersion along with factors effecting atmospheric stability and this course also covers Analysis of quality of air in the form of air quality index along with national air quality standards. This course focuses on various sources water pollution, water quality standards and parameters. Finally it gives an understanding on Design and development of an suitable equipment for Control of various air and water pollutants  **Course Outcomes:**  **At the end of successful completion of the course the student will be able to**  CO1: Identify the various air and noise pollutants, source , and their impacts on Atmosphere  CO2: Understand basic concept and Mechanisms of Pollutant Dispersion in atmosphere.  CO3: Analyze quality of air in the form of air quality index.  CO4: Analyze water quality and water pollution effects on health and environment  CO5: Design and develop an suitable equipment for Control of various air and water pollutants |

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| **Module No** | **Unit No** | **Topics** | **Hrs.** | **CO** |
| **1** | **Air and Noise Pollutants** | | **07** | **CO1** |
|  | **1.1** | **Air Pollutants:** Air and its composition, Sources of air pollution. Major air Pollutants and their characteristics, Specific group pollutants such as CFC, GHG etc. Air Pollutants from various industrial sectors. Impact of air pollution on human health and vegetation. |  |  |
| **1.2** | **Noise Pollutants**: Difference between sound and noise, Pitch and Frequency, Sound Pressure level (Decibel), sources of noise and harmful effects of noise, noise measurement and noise control measures. |
| **2** | **Pollutant Dispersion** | | **06** | **CO2** |
|  | **2.1** | Concept of atmospheric stability. Adiabatic and Environmental Lapse rate. Plume behavior. Effect of topography, Effect of wind on Pollutant dispersion. Concept of maximum mixing depth and ventilation coefficient. Plume rise and Effective stack height. |  |  |
| **3** | **Air Quality** | | **05** | **CO3** |
|  | **3.1** | Introduction to Air quality index and Comprehensive Environmental Pollution Index etc. and its application. Sampling and measurement of air pollutants. Various treaties and protocols: Kyoto Protocol and Montreal Protocol etc. Introduction to National Ambient Air Quality Standards. |  |  |
| **4** | **Water Pollution:** | | **05** | **CO4** |
|  | **4.1** | Introduction: Significance, Sources, Impact and Measurement of Physical, chemical and biological water quality parameters.  Water quality standards and parameters, Assessment of water quality, Aquatic Pollution, Freshwater pollution, Estuarine water quality, Marine pollution, Biochemical oxygen demand, Chemical oxygen demand, DO and BOD demand in streams, |  |  |
| **5** | **Control methods and equipment** | | **07** | **CO5** |
|  | **5.1** | Introduction to control methods and equipment for Particulate matter and gases measurement and control. Design and working of scrubbers, Electrostatic Precipitator, Gravity settlers, Cyclone separator, Filter bags etc. Transformation process in water bodies, Oxygen transfer by water bodies, turbulent mixing, water quality in lakes and preservers, Eutrophication, Ground water quality measures. |  |  |
| **Total** | | | **30** |  |

**Self learning topics:** Gas laws, basics of thermodynamics, basics of engine and their working **Recommended Books:**

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| **Sr. No.** | **Name/s of Author/s** | **Title of Book** | **Name of Publisher with Country** | **Edition and Year of Publication** |
|  | Sainfeld, J.H | *Air Pollution. Physical and Chemical Fundamentals* | McGraw Hill, Ney yark | Fourth Edition,  1975 |
|  | A Tiwari and J Colls | *Air Pollution: Measurement, Modeling and Mitigation* | Taylor & Francis, | Fifth Edition,  2010 |
|  | L Theodore, | *Air Pollution Control Equipment Calculations* | John Wiley and Sons | Sixth Edition, 2009 |
|  | [P. K. Goel](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22P.+K.+Goel%22&source=gbs_metadata_r&cad=7) | *Water Pollution: Causes, Effects and Control* | New Age International, 2006 | 3rd Edition 2006 |
|  | Enda Murphy, Evoin A. King | Environmental Noise Polluttion | Elsevier | 1st Edition, 2014. |
|  | S P Singal | Noise Pollution and Control | Narosa Pub | 1st Edition, 2000. |