Module Code	CEP55E03
Module Name	Air Pollution: Monitoring, Assessment & Control
ECTS Weighting[1]	5 ECTS
Semester taught	Semester 1
Module Coordinator/s	Asst Prof. John Gallagher [j.gallagher@tcd.ie] Lecturer(s): Asst Prof. John Gallagher Adj Asst Prof. Saniul Alam Dr Avril Challoner
Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline	On successful completion of this module, students should be able to: LO1. Describe key concepts relating to air pollution science and its application to environmental engineering. LO2. Assess, apply and evaluate differing forms of air pollution models for the prediction of concentrations in the atmosphere. LO3. Appraise differing approaches to the control of air pollution for indoor and outdoor settings and in urban and industrial settings. LO4. Discuss the development and application of national emissions inventories and projections. LO5. Measure air pollution concentrations in practice and identify the advantages and limitations of differing monitoring approaches. L06. Critically assess an environmental impact assessment of new infrastructure developments or policy from an air pollution perspective. **Graduate Attributes: levels of attainment** To act responsibly - Enhanced To think independently - Attained To develop continuously - Attained To communicate effectively – Enhanced

Module Content	The module commences with an introduction to the field of air pollution science, identifying the current challenges in the field and key background knowledge in the provision of clean air for society and the environment. The module explores the use of air pollution modelling to predict concentrations in various settings and to assess the impacts of policy changes, new technology or developments. The module also explores the control of air pollution in outdoor and indoor conditions from an environmental engineering perspective with a particular focus on sustainable approaches. We examine the development of national emissions inventories and the projection of pollution into the future using forecasting techniques. We appraise the physical measurement of air pollutants using field equipment. The module deals with the development of environmental impact assessment in relation to air pollution in infrastructure developments/policy, using case studies (e.g., incineration, construction projects, roads, etc).
Teaching and Learning Methods	All lectures will be delivered live from a lecture theatre (face-to-face) format, with remote access via Blackboard Collaborate and all sessions will be recorded. As such this blended course will apply flipped classroom components for face-to-face students and groups online, combining traditional lecture formats for student tasks and promoting peer-learning. Discussion boards will be provided for virtual students who have limited interaction with the class in the lecture theatre, to allow for questions related to topic areas covered and coursework. Two field practicals (face-to-face) will provide hands-on experience of air quality science to ground fundamentals and context for some coursework and lecture material. Coursework provides opportunity to demonstrate independent learning through developing new skills (reviewing literature) and using new tools (air quality modelling software). Feedback provides further opportunity to learn.

Assessment Details[2]

Please include the following:

- **Assessment Component**
- **Assessment description**
- **Learning Outcome(s) addressed**
- **% of total**
- **Assessment due date**

Assessment Component	Assessment Description	LO Addressed	% of total	Week due
Personal Exposure monitoring, modelling & mitigation	Personal exposure monitoring and modelling study including assessment of policy and mitigation measures (30-page limit).	LO1-LO6	100%	Wk12

Reassessment Requirements	Resubmission of failed coursework.

Contact Hours and Indicative Student Workload[2]	**Contact hours:** 30 hours Lectures – 3 hours per week Tutorials – 3 hours **Independent Study (preparation for course and review of materials):** 15 hours Review of lecture notes suggested reading and scientific papers provided for revision during the semester. **Independent Study (preparation for assessment, incl. completion of assessment): 80** (coursework) Data collection and analysis using air pollution monitoring equipment. Application of monitoring, modelling and control application of air pollution modelling tools. Review of scientific literature to develop a mitigation strategy.
Recommended Reading List	
Module Pre-requisite	
Module Co-requisite	
Module Website	
Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.	
Module Approval Date	
Approved by	
Academic Start Year	2023
Academic Year of Date	2024/2025