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]
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 outdoor and indoor 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 evaluate 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 adoption of, and best practice in, air pollution monitoring and modelling, to help understand concentrations and exposure 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 to air pollution mitigation or management. The development

	of national emissions inventories is examined and inform how to approach the projection of pollution into the future using forecasting techniques. The module deals with the development of environmental impact assessment in relation to air pollution in infrastructure developments/policy, using case studies examples to demonstrate good and/or bad practice (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, and complementary practicals will use the University campus, adjacent streets, and local park for data collection and observational assessments. This course will combine traditional lectures with case studies that inform problem-based and simulation-based learning, and this shapes the students approach to assessment and promotes collaboration through peer-learning. The two field tutorials/practicals 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 and group-based learning to developing new skills (air pollution monitoring) including using new tools (air quality dispersion and atmospheric modelling software), and competencies (critical thinking, systems thinking, strategic, and integrated problem-solving).

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/Practicals – 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 hours (coursework) Data 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	2025
Academic Year of Date	2025/2026