Subject Description Form

Subject Code	CSE29331
Subject Title	Air and Noise Pollution Studies
Credit Value	3
Level	2
Exclusions	Nil
Objectives	To provide basic knowledge about the causes, impact and control of air and noise pollution.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. have the basic knowledge of contemporary air and noise pollution, including chemistry and/or physics involved, commonly used methods for monitoring, prediction, and assessment; b. have general understanding of commonly used control technologies for reducing air and noise pollution; c. work as an entry-level staff in the air and noise pollution profession; d. have the basic ability to analyze data and issue in a logical way. e. recognize the need for and engage in life-long learning.
Subject Synopsis/ Indicative Syllabus	**Air Pollution Studies** 1. Chemical and physical characteristics of the atmosphere Definition of air pollution; Common sources and sink of main air pollutants in the atmosphere. 2. Air quality monitoring and emission assessment Basic methods and techniques for the measurements and analysis of gaseous and particulate pollutants in the air, and from the emission sources. 3. Air pollution dispersion modelling Principle of dispersion and transport of air pollutants; Application of Gaussian Dispersion Model. 4. Stationary and mobile sources of air pollutants and their control Introduction to control devices of gas- and particle-phase pollutants from stationary sources; control methods of gas- and particle-phase pollutants from mobile sources. 5. Indoor air pollution Basic knowledge of indoor air pollutants and factors affecting their levels, the sources of air pollutants, and the application of Indoor Air Pollution model.

	Noise Pollution Studies

Noise Pollution Studies

1. Environmental Noise Prediction
   Definition of noise pollution. Geometric spreading of sound from simple sources.

2. Noise Assessment
   Basic principles, instrumentations, monitoring approaches, data evaluation and analysis.

3. Road Traffic Noise
   Traffic noise - sources, emission limits, characteristics and propagation. Noise prediction methodology.

4. Railbound Traffic Noise
   Railway noise - sources, emission limits, characteristics and propagation. Noise prediction methodology.

5. Construction and Industrial Noise
   Major noise sources. Noise prediction methodology. Regulatory standards and work permits. Engineering and management controls.

Teaching/Learning Methodology	In lectures, students will be presented with an overview of the nature of air and noise pollution. They will also be taught the knowledge required to predict and assess air and noise pollution impacts and to make recommendations for solution. The lecture will be keynote in nature, and students will be encouraged to read pre-assigned references. Laboratory sessions will involve familiarization with the relevant basic measuring instruments. Tutorials will be used to discuss readings, assignments and laboratory reports.
Assessment Methods in Alignment with Intended Learning Outcomes	(see table below)

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed				
		a	b	c	d	e
1. Homework, quizzes, in-class problems and lab reports	30	√	√	√	√	√
2. Final examination	70	√	√	√	√	
Total	100					

Students must attain at least grade D in both coursework and final examination (whenever applicable) in order to attain a passing grade in the overall result.

	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: Homework – To help students further understand what they learnt in the lectures. Quiz –To test if students have grasped the underlying ideas. In-class problem - During class periods, students will sometimes be asked to work a problem in a group or individually. These problems are designed to help students learn to utilize the concepts discussed in the reading material and covered in the quiz. Lab experiment – It will provide students first-hand experience in understanding the sources, analysis and control of air pollutants and noise. Students are required to carry out experiments under the supervision of lecturers and lab technicians. Seminar – It will help students for exploring their views in relevant areas. Final examination - The exam tests student's ability to utilize the concepts covered in this course.	
		Average hours per week
Student Study Effort Expected	Class contact:	
	▪ Lectures/ Tutorials/ Laboratory	3 Hrs.
	Other student study effort:	
	▪ Completion of assignments and lab reports	3 Hrs.
	▪ Self Study	3 Hrs.
	Total student study effort	9 Hrs.
Reading List and References	Daniel A. Vallero, *Fundamentals of Air Pollution (5th Edition)*, Academic Press, Elsevier, 2014. Hassan O.A.B. *Building Acoustics and Vibration*, World Scientific, 2009. Jian Kang, *Urban Sound Environment*, Taylor & Francis, 2007. Noel De Nevers, *Air Pollution Control Engineering*, McGraw Hill, 2000.	

	Peter Brimblecombe, *Air Pollution Reviews – Vol. 6: Air Pollution Episodes*, London: World Scientific Publishing Europe Ltd., 2018. Randall F. Barron, *Industrial Noise Control and Acoustics*, CRC Press, Inc. 2002. Lawrence E. Kinsler, *Fundamentals of Acoustics*, John Wiley, 2000. Thad Godish, *Air Quality*, 4th edition, Lewis Publishers, 2004.