Subject Description Form

Subject Code	ME559
Subject Title	Advanced Environmental and Transportation Noise Control
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Students should have basic knowledge in Thermofluids and Noise. Some working experience in industry or environmental sectors is desirable. Exclusion: ME535 Industrial and Transportation Noise Control
Objectives	To provide students with knowledge of practical and systematic approach to control noise due to environmental and transportation noise sources.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. possess state-of-the-art knowledge and skills in the area of physical parameters of sound in transportation and the assessment method; b. apply their knowledge, skills and hand-on experience to measure, calculate and assess the noise level in transportation and keeping aware of the environmental issues, existing regulation and policies concerning noise control; c. extend their knowledge of sound prediction and noise assessment to different situations of engineering context and professional practice; and d. have recognition of the need for, and an ability to engage in life-long learning.
Subject Synopsis/ Indicative Syllabus	*Road Traffic Noise:* Traffic noise indices; calculation of road traffic noise (CRTN) – prediction procedures; the measurement of road traffic noise; the standard drive past test; assessment of noise and vibration impacts due to road traffic. *Control of Vehicle Noise:* Identification of noise sources; strategies for controlling vehicle noise; porous pavement for reducing tyre noise; acoustical performance of traffic noise barriers; absorptive barriers; in-situ determination of the acoustical performance of roadside barriers. *Aircraft Noise:* Aircraft noise indices; noise certification; aircraft noise sources; the integrated noise model (INM) for aircraft noise prediction; Nordic guidelines for calculation of air traffic noise. *Rail Transport Noise:* Railway noise indices; sources of train noise; prediction of train noise – calculation of rail noise (CRN); strategies of controlling rail noise; vibration from railways and its control; measurement techniques.
Teaching/Learning Methodology	1. The teaching and learning methods include lectures/tutorial sessions, homework assignments, test, case study report and examination. 2. The continuous assessment and examination are aimed at providing students with integrated knowledge required for advanced environmental and transportation noise control. 3. Technical/practical examples and problems are raised and discussed in class/tutorial sessions.

Teaching/Learning Methodology	Intended subject learning outcomes			
	a	b	c	d
1. Lecture	√	√	√	√
2. Tutorial	√	√	√	√
3. Homework assignment	√	√	√	√
4. Case study report and presentation	√	√	√	

Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
			a	b	c	d
	1. Homework assignment	20%	√	√	√	√
	2. Test	20%	√	√		
	3. Case study report and presentation	20%	√	√	√	
	4. Examination	40%	√	√	√	√
	Total	100%				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Overall Assessment:

$0.40 \times$ End of Subject Examination $+ 0.60 \times$ Continuous Assessment

The continuous assessment consists of three components: homework assignments, test, and case study report & presentation. They are aimed at evaluating the progress of students study, assisting them in self-monitoring of fulfilling the respective subject learning outcomes, and enhancing the integration of the knowledge learnt.

The examination is used to assess the knowledge acquired by the students for understanding and analyzing the problems critically and independently; as well as to determine the degree of achieving the subject learning outcomes.

Student Study Effort Expected	Class contact:	
	▪ Lecture	24 Hrs.
	▪ Tutorial/Case study	15 Hrs.
	Other student study effort:	
	▪ Self Study	45 Hrs.
	▪ Case study report preparation and presentation	21 Hrs.
	Total student study effort	105 Hrs.

Reading List and References	1. Bies D. A. and Hansen C. H., *Engineering Noise Control – Theory and Practice*, E&FN Spon, latest edition. 2. Bell, L. H. *Industrial Noise Control – Fundamentals and Applications*, Marcel Dekker Inc., latest edition. 3. Institute of Acoustics, *Diploma in Acoustics and Noise Control – Tutored Distance Learning Programme, Transportation Noise Unit 1 and Unit 2*. 4. Nelson P. M. (Ed.), *Transportation noise Reference Book*, Butterworths, latest edition.