Subject Description Form

Subject Code	CSE525
Subject Title	Noise Pollution Control
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	**Mutual exclusions**: *Building Acoustics* (BSE541) or *Air and Noise Pollution Management* (CSE541) Recommended background knowledge: Engineering or applied science undergraduate background.
Objectives	To provide students with an understanding of the measurement, assessment and control of noise emitted from transportation, construction and industrial activities.
Intended Learning Outcomes	Upon completion of the subject, students will be able: a. to apply the fundamental knowledge of noise control and assessment to formulate effective solution to environmental engineering problems in Hong Kong; b. to identify, structure and analyze diverse problems arising from the changing constraints that influence engineering projects, such as environmental, legislative, sustainability, and technological considerations; c. to work with others in group works, and take responsibility for an agreed area of a shared activity; and d. to have creative and critical thinking and an ability to work independently.
Subject Synopsis/ Indicative Syllabus	**Keyword Syllabus** i) Basic Acoustics Sound sources - spherical and cylindrical radiation, acoustic parameters. Decibel scales - sound pressure level, sound intensity level, sound power level, directivity index. Atmospheric noise propagation, background noise, multiple sources. ii) Measurement Instrumentation Sound level meters and accessories - sensitivity, frequency response and dynamic range. Filter characteristics, weighting functions, averaging time.

<table>
<tr><td></td><td>iii) <u>Road Traffic</u>

Vehicle noise - sources, emission limits. Traffic noise - characteristics, propagation. Noise criteria. Noise prediction and assessment. Methods of noise control for new roads and buildings.

iv) <u>Railbound Traffic</u>

Wayside noise and vibration, squealing noise. Noise sources and control technology. Noise prediction and assessment. Noise control for new railways.

v) <u>Construction & Industrial Noise</u>

Major noise sources - powered mechanical equipment, piling and demolition operations. Noise prediction and assessment. Engineering and management control.

vi) <u>Noise Control Devices</u>

Noise reflection and transmission across partitions. Sound absorption material, silencers, acoustic panels, isolators. Enclosure design and examples.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Lecture will provide basic knowledge relating to noise measurement, assessment and control design. Local case studies of traffic noise control, rail noise control in East Rail, West Rail will be introduced.

Tutorial will provide students with opportunities to carry out real experimental works for noise enclosure and acoustic silencer.

Independent study and associated reading will require students to conduct some problem-solving exercises independently and apply to case studies in Hong Kong.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="4">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a.</td><td>b.</td><td>c.</td><td>d.</td></tr>
<tr><td>1.Continuous Assessment</td><td>40%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2.Written Examination</td><td>60%</td><td>✓</td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>Total</td><td>100%</td><td colspan="4"></td></tr>
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	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: The continuous assessment will be based on laboratory reports (10%), tutorial exercises (20%) and group discussions (10%) of case studies. Written examination is evaluated by final examination. **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.**
Reading List and References	**<u>Books</u>** Beranek, L.L. and Ver, I.L., *Noise and Vibration Control Engineering*, Wiley, (1992). Cavanaugh, W.J., *Architectural Acoustics*, Wiley, (1999). Hansen, C.H., *Noise Control: from concept to application*, Taylor & Francis, (2005). Nelson, P.M., *Transportation Noise Reference Book*, Butterworths, (1987). **<u>Conference Proceedings & Symposia</u>** Proceeding Inter-Noise, 1998 – present **<u>Journals</u>** Journal of Acoustical Society of America Journal of Sound and Vibration Noise Control Engineering Journal **<u>Reports and Standards</u>** *BS 5228 Noise Control on Construction and Open Sites*, London, British Standards Institution *Environmental Guidelines for Planning in Hong Kong*, by Hong Kong Government *Noise Control Ordinance 1988*