

## Subject Description Form

Subject Code	<b>BSE4416</b>																																																				
Subject Title	<b>Acoustics Engineering</b>																																																				
Credit Value	3																																																				
Level	4																																																				
Pre-requisite Co-requisite Exclusion	Nil Nil Nil																																																				
Objectives	This subject provides students with up-to-date knowledge on the acoustics and vibration technologies and design for building related applications. The subject enables students to acquire knowledge of basic theories of building acoustics and to apply them in practice.																																																				
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <p>a) apply the knowledge on the acoustics and vibration technologies and design for building related applications;</p> <p>b) acquire the knowledge of basic theories of building acoustics and vibration;</p> <p>c) apply various technologies and provide novel solutions for acoustics and vibration control;</p> <p>d) perform basic calculations and use acoustics and vibration recommendations/standards for acoustics and vibration design; and</p> <p>e) perform basic calculations in the design of acoustics and vibration control.</p>																																																				
Subject Synopsis/ Indicative Syllabus	<p>Acoustical parameters: basic terminology and definitions of acoustical parameters in building acoustics and vibration. Noise sources and frequency analysis.</p> <p>Basic theories and calculation: dB arithmetic, air-borne sound problems and prediction, room and duct modes.</p> <p>Building noise control and design methodology: sound absorption and transmission. Silencer principles and design. Duct-borne sound prediction. Regenerated noise and prediction. Acoustic enclosures. Sound barriers. Vibration isolation. Assessment of performance of vibration isolation. Various recommendations and design criteria. Noise indices and room acoustics. Local legislation. Acoustical measurements.</p> <p>Advanced technologies: structure-borne sound predictions. Mobility consideration.</p>																																																				
Teaching/Learning Methodology	<p>Lectures and tutorials</p> <p>Seminars (seminar oral presentation + seminar report)</p> <p>Independent study</p> <p>Demonstrations</p>																																																				
Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 30%;">Specific assessment methods/tasks</th> <th rowspan="2" style="width: 10%;">% weighting</th> <th colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th style="width: 5%;">a</th> <th style="width: 5%;">b</th> <th style="width: 5%;">c</th> <th style="width: 5%;">d</th> <th style="width: 5%;">e</th> <th style="width: 5%;"></th> </tr> </thead> <tbody> <tr> <td>In-class or take-home assessment</td> <td style="text-align: center;">20</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>Self-study group report and presentation</td> <td style="text-align: center;">20</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>Coursework*</td> <td style="text-align: center;">60</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td><b>Total</b></td> <td style="text-align: center;"><b>100</b></td> <td colspan="6"></td> </tr> </tbody> </table>							Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)						a	b	c	d	e		In-class or take-home assessment	20	✓	✓	✓	✓	✓		Self-study group report and presentation	20	✓	✓	✓	✓	✓		Coursework*	60	✓	✓	✓	✓	✓		<b>Total</b>	<b>100</b>						
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	<p>* For details, please refer to the 2020/21 Semester 1 Subject teaching scheme/schedule.</p> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Assessment of students' performance in the subject will comprise coursework (40%) and examination (60%).</p> <p>The coursework will include:</p> <ul style="list-style-type: none"> <li>• in-class or take-home assessment; and</li> <li>• student seminar and self-study report.</li> </ul>	
Student Study Effort Expected	Class contact:	
	▪ Lectures	21 Hrs.
	▪ Seminars	6 Hrs.
	▪ Tutorials	9 Hrs.
	▪ In-class or take-home assessment	3 Hrs.
	Other student study effort:	
	▪ Self-study hours	78 Hrs.
	Total student study effort	
Reading List and References	<p>Concert Halls and Theatres: How they sound. L. L. Beranek, 1996.</p> <p>Fundamentals of Acoustics. L. E. Kinsler, A. R. Frey, A. B. Coppens and J. V. Sanders, 2000.</p> <p>Handbook of Acoustical Measurements and Noise Control. C. M. Harris, 1991</p> <p>Noise Control in Building Services. A. Fry, 1988.</p> <p>Woods Practical Guide to Noise Control. I. Sharland, 1972.</p> <p>Architectural Acoustics, Principles and Design. M. Mehta, J Johnson and J Rocafort, 1999.</p>	