



UNIVERSITI TEKNOLOGI MARA

BCM553: ENVIRONMENTAL SCIENCE AND ENGINEERING II

<b>Course Name (English)</b>	ENVIRONMENTAL SCIENCE AND ENGINEERING II <b>APPROVED</b>
<b>Course Code</b>	BCM553
<b>MQF Credit</b>	3
<b>Course Description</b>	This course deals with further discussions on the development and scientific principles of environmental science relating to the built environment. This course provides students with the opportunity to understand and relate the importance of lighting and sound elements in design. It focuses on these main topics: lighting, sound and acoustics.
<b>Transferable Skills</b>	Information Management skill Project management skill Communication skill Presentation skill
<b>Teaching Methodologies</b>	Lectures, Lab Work, Case Study, Tutorial
<b>CLO</b>	CLO1 Evaluate the impacts and importance of lighting and acoustic in built environment. CLO2 Present with confidence and responsive on lighting and acoustic in built environment issues. CLO3 Measure lighting and acoustic components for built environment case studies.
<b>Pre-Requisite Courses</b>	No course recommendations
<b>Topics</b>	
<b>1. Lighting</b> 1.1) Overview of Audio-Visual 1.2) Daylight factors and prediction of daylight 1.3) Influence of openings, roof-light size, shape and position 1.4) Standards and statutory requirements 1.5) Artificial Lighting- introduction, terminology and functions 1.6) General types of lamps and luminaries 1.7) Design characteristics and lighting criteria 1.8) Lumen method – application and restrictions and glare index 1.9) Integration of daylight & artificial light 1.10) Lighting for specialised buildings such as hospitals, factories, etc.	
<b>2. Sound</b> 2.1) Principle of acoustic 2.2) Theory of sound and sound propagation 2.3) Sound terminologies and sound level 2.4) Sound power, sound intensity and sound pressure 2.5) Threshold levels, audiometric elements 2.6) Sound measurements and calculations	
<b>3. Noise</b> 3.1) Measurement and calculation of noise 3.2) Techniques of noise control 3.3) Airbourne impact, flanking noise 3.4) Insulation, sound reduction index.	

#### **4. Room Acoustic**

- 4.1) General requirements of good acoustics
- 4.2) Sound path in a room
- 4.3) Sound reflection and types of reflectors
- 4.4) Sound absorption, absorption coefficient, types of absorber
- 4.5) Reverberation
- 4.6) The effect on room shape, calculation of reverberation time
- 4.7) Building Legislation

Assessment Breakdown	%
Continuous Assessment	40.00%
Final Assessment	60.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Lighting and Acoustics	10%	CLO1
	Presentation	Lighting and Acoustic	10%	CLO2
	Test	Lighting and Acoustic	10%	CLO1
	Written Report	Lighting and Acoustic	10%	CLO3

Reading List	Recommended Text	<ul style="list-style-type: none"> <li>• McMullan, R 2006, <i>Environmental Science in Buildings</i>, 3rd ed. Ed., MacMillan Education Ltd. London</li> <li>• Clement-Croome 1996, <i>Air Quality and Thermal Comfort in Building</i>, Longman London</li> <li>• Smith Peter and Owen 1996, <i>Acoustic &amp; Noise Control</i>, Longman London</li> </ul>
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	