



UNIVERSITI TEKNOLOGI MARA

AAR504: ARCHITECTURAL SCIENCE I

<b>Course Name (English)</b>	ARCHITECTURAL SCIENCE I <b>APPROVED</b>
<b>Course Code</b>	AAR504
<b>MQF Credit</b>	2
<b>Course Description</b>	A study of the principles of light, visual comfort, and the importance of daylighting and natural ventilation in sustainable architectural. It will also cover thermal factors in building design.
<b>Transferable Skills</b>	Creative and innovative solution provider
<b>Teaching Methodologies</b>	Lectures, Lab Work, Case Study, Tutorial
<b>CLO</b>	CLO1 Demonstrate the utilisation and effects of environmental sciences in building design. CLO2 Discuss the application of environmental sciences in building design.
<b>Pre-Requisite Courses</b>	No course recommendations
<b>Topics</b>	
<b>1. Principles of Illumination</b> 1.1) Nature of light, task lighting, lighting levels 1.2) Contrast, colour of light, space geometry	
<b>2. Daylighting</b> 2.1) Climate and light, daylight factor concept 2.2) Design variables, design sky concept, daylight requirements	
<b>3. Problems in Daylighting</b> 3.1) Daylighting in the Tropics (Hot Humid zone), glare	
<b>4. Thermal Comfort Factors</b> 4.1) Temperature, humidity, radiation, rainfall, wind, vegetation 4.2) Body's thermal balance and metabolism 4.3) Human response to thermal environment	
<b>5. Comfort Zone</b> 5.1) Basic climatic factors that effect human comfort 5.2) Comfort zone, Bioclimatic chart and its usage 5.3) Basic psychometric chart	
<b>6. Natural ventilation and air movement</b> 6.1) Functions 6.2) Provisions of ventilation; stack effect, wind effects, external features. 6.3) Indoor environment quality (IEQ)	
<b>7. Heat Exchange in Buildings</b> 7.1) Heat gain, heat loss and Sol-air temperature. 7.2) Solar gain factors	
<b>8. Thermal Quantities of Building Materials</b> 8.1) Sensible heat, specific heat and latent heat 8.2) Heat transmission, "U" value and "Time lag" 8.3) Reduction of solar heat gain through the fabric and openings	
<b>9. Balance House</b> 9.1) Adapting to climate: planning, orientation, form and construction	

Assessment Breakdown	%
Continuous Assessment	40.00%
Final Assessment	60.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Assessment on the application of environmental sciences in building design.	40%	CLO2

Reading List	Reference Book Resources	<ul style="list-style-type: none"> <li>• M.J Crosbie 2004, <i>Architecture and Science</i>, Images Publishing</li> <li>• Reynolds, John S. 2002, <i>Courtyards: Aesthetics, Social and Thermal De</i>, USA: John Wiley &amp; Sons, Inc</li> <li>• Brown, G.Z. 2001, <i>Sun, Wind and Light: Architectural Design Str</i>, USA: John Wiley &amp; Sons, Inc</li> <li>• Bunham, R. 1969, <i>The Architecture of the Well Tempered Environ</i>, London, Architectural Press</li> </ul>
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	