UNIVERSITI TEKNOLOGI MARA

ARK704: SUSTAINABLE ENVIRONMENT

Course Name (English)	SUSTAINABLE ENVIRONMENT APPROVED
Course Code	ARK704
MQF Credit	2
Course Description	This course aims to instill environmental attitude amongst students by highlighting the impact of the building industry activities on the environment and seek for sustainable design solutions. Students are encouraged to familiarise themselves with various environmental design assessment tools and building performance instrumentations. At the end of the course students will carry out an environmental assessment on a building or urban design proposal or conduct a performance study of an occupied building using appropriate tools
Transferable Skills	Upon completion students should be able to: • Demonstrate an understanding and appreciation of the concept of sustainability, and its applications to architectural design and practices. • Apply environmental and sustainable design strategies in an architectural or urban design project. • Understand building performance assessment using appropriate environmental assessment tools or rating system.
Teaching Methodologies	Lectures, Field Trip, Simulation Activity, Discussion, Presentation
CLO	CLO1 Explain understanding and appreciation of the concept of sustainability and its applications to architectural design and practices. CLO2 Demonstrate performance of a building using appropriate environmental assessment tools or rating system.
Pre-Requisite Courses	No course recommendations

Topics
1. Introduction 1.1) N/A
2. Background on sustainability and impacts of man on the environment 2.1) Human activities and Greenhouse effect 2.2) Global warming and heat island 2.3) Ethical stance and Architects role
3. Key concept on sustainability & its relationship to the comfort of man 3.1) Sustainability dimensions, Human thermal, visual and acoustical component 3.2) Energy efficiency, Carbon emission, Urban sustainability, Indoor air quality 3.3) Performance and assessment
4. Sustainable environment design practices. 4.1) Daylighting and its applications 4.2) Passive and Hybrid system for ventilation and cooling and Noise control
5. Environmental assessment tools and rating systems. 5.1) LEEDS, BREEAM, GBI, etc. 5.2) Basic design rules- daylighting, natural ventilation, etc) 5.3) Carbon footprint 5.4) OTTV (Overall Thermal Transfer Value), Annual Energy Index 5.5) Recyclable content, Embodied Energy and Life Cycle Analysis
6. MS1525 & OOTV 6.1) N/A

Assessment Breakdown	%
Continuous Assessment	40.00%
Final Assessment	60.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	n/a	40%	CLO2

Reading List

Recommended Text

- **Smith, P. F. 2005, *Architecture in a Climate of Change: A guide to sustainable design*, Architectural Press Oxford**
- **Szokolay, S.V. 2004, *Introduction to Architectural Science: The Basis of Sustainable Design*, Architectural Press Oxford**

Reference Book Resources

- **Givoni, B. 1998, *Climate Considerations in Building and Urban Design*, Van Nostrand Reinhold New York**
- **Graham, P. 2003, *Building Ecology: First Principles for a Sustainable Built Environment*, Blackwell Science Oxford**
- **Hagan, S 2001, *Taking Shape: A New Contract between Architecture and Nature*, Architectural Press Oxford**
- **Harrison, A., Loe, E., Read, J. 1998, *Intelligent Buildings in South East Asia,*, E & FN Spon London**
- **Herzog, T. 1996, *Solar Energy in Architecture and Urban Planning*, Prestel Munich**
- **Nebel, B. & Wright, R.T. 1998, *Environmental Science*, 6th Ed., Prentice Hall New Jersey**
- **Santamouris, M. 2009, *Advances in Building Energy 3*, Vol 3 Ed., Earthscan London**

Article/Paper List

Reference Article/Paper Resources

- **Lee, K. I. 2003, A Study on the Environmental Sustainability Assessment of Multi-Family Housing Estates in Korea, *JAABE*, 2, b83b**
- **Teriman, Suharto and Yigitcanlar, Tan and Mayere, Severine 2009, Sustainable urban development : a quadruple bottom line assessment framework, *The Second Infrastructure Theme Postgraduate Conference : Conference Proceedings*, 26 March 2009**

Other References

This Course does not have any other resources