



UNIVERSITI TEKNOLOGI MARA

EVT554: ENVIRONMENTAL INFORMATION SYSTEM

Course Name (English)	ENVIRONMENTAL INFORMATION SYSTEM APPROVED
Course Code	EVT554
MQF Credit	3
Course Description	This course is intended to introduce and assess the fundamental concepts of environmental information system in the context of environmental management and monitoring using GIS and remote sensing technologies. Students will be introduced to a number of case studies regarding environmental changes and sustainability issues to explore the wide range of GIS and remote sensing applications, but gain depth in selected areas through hands-on practical and ways to extract meaningful geophysical information from remote sensing data to solve environmental problems.
Transferable Skills	Sustainable solution through scientific reasoning good digital skill Use quantitative and qualitative data
Teaching Methodologies	Lectures, Lab Work, Discussion
CLO	CLO1 Describe the concept of environmental information system CLO2 Analyze environmental information into spatial and non-spatial data CLO3 Demonstrate the skill of applying GIS and remote sensing technology into environmental applications
Pre-Requisite Courses	No course recommendations
Topics	
1. Environmental Information System 1.1) Environmental Changes and dynamic 1.2) Environmental Management at Diverse Spatial and Temporal Scales 1.3) Spatial and Non-spatial Data 1.4) Cloud Computing for Environmental Information System	
2. Principle of Remote Sensing 2.1) Remote Sensing In A Nutshell 2.2) What Can Remote Sensing Data Tell Us	
3. Remote Sensing Systems 3.1) Active and Passive Systems, 3.2) Imaging and Non Imaging Systems 3.3) Concept of Resolutions in RS: 3.4) Spatial 3.5) Spectral 3.6) Radiometric 3.7) Temporal	
4. Geographical Information System 4.1) Spatial Information System: An Overview 4.2) Hardware and Software requirements of GIS 4.3) Conceptual Model of Spatial Information 4.4) Concept of databases and Conceptual Models of Non-Spatial Information 4.5) GIS Data Creation and Organization	
5. Geospatial Big Data 5.1) Data Quality 5.2) Sources of Errors in GIS	

6. Coordinate system and map projection

- 6.1) Geographic Coordinate System
- 6.2) Map Projections
- 6.3) Commonly Used Map Projections

7. Vector Data Model

- 7.1) Representation of Simple Features
- 7.2) Vector Data structure
- 7.3) Topology
- 7.4) The Coverage

8. Raster Data Model

- 8.1) Elements of the Raster Data Model
- 8.2) Raster Data Structure
- 8.3) Data Conversion and Integration

9. Environmental Spatial Modeling and Analysis

- 9.1) Introduction to Spatial Analysis
- 9.2) Elements of Geospatial Modeling
- 9.3) Data Exploration
- 9.4) Vector-based Analysis
- 9.5) Raster-based Analysis
- 9.6) Spatial Interpolation

10. Selected environmental application using integrated GIS and Remote Sensing technology

- 10.1) Land Use and Non-Point Source Pollution Studies
- 10.2) Data Processing and Analysis for air quality studies
- 10.3) Geo-spatial Technologies for Urban Environment Studies
- 10.4) Remote Sensing Applications Water quality studies
- 10.5) Heavy metal concentration distribution for risk and hazard assessment
- 10.6) Recent trend in GIS and remote sensing

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Giving assignments to the students is to provide a practice exposure and knowledge enhancement of a subject	20%	CLO1
	Lab Exercise	Laboratory experiences may help students learn to address the challenges inherent in directly observing and manipulating the material world, including troubleshooting equipment used to make observations, understanding measurement error, and interpreting and aggregating the resulting data	20%	CLO3
	Test	Test 1 is to measure students' understanding of specific content or the effective application of critical thinking skills. Such tests are used to evaluate student learning, skill level growth and academic achievements at the end of Lecture 1, 2, 3 and 4.	20%	CLO1

Reading List	Recommended Text
	<ul style="list-style-type: none"> • Chang, K. T., 2016, <i>Introduction to Geographic Information Systems</i>, 8 ed Ed., McGraw-Hill Education. • Fernandez-Prieto, D. 2013, <i>Remote Sensing Advances for Earth System Science : The ESA Changing</i>, Berlin: Springer • Belmont. Lillesand, T.M. and Kiefer, W.R 1999, <i>Remote sensing and image interpretation</i>, John-Wiley and Sons Inc • Jensen, J.R 2000, <i>Remote sensing of the Environment: An Earth, 2 Ed.</i>, Taylor & Francis

Article/Paper List	This Course does not have any article/paper resources

Other References	
	<ul style="list-style-type: none"> • n/a Asmat, A and Mansor, S 2013, <i>Hyperspectral Imaging: Processing and Applications.</i> , University Press UiTM, Shah Alam • n/a Isa, N. A 2017, <i>he International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences., The effect of built up and green areas on the Land surface temperature of the Kuala Lumpur City</i> • n/a Kampfer, N <i>Monitoring atmospheric water vapour: ground based remote sensing and in situ methods</i> , Springer., New York: • n/a Lenoble, J. 2013, <i>Aerosol remote sensing</i>, Springer., Berlin: