Asian Institute of Technology
School of Engineering and Technology

AT76.27 ***Geospatial Modeling for Environment*** **2 (1-3)** **Semester: January**

Course Objective: This course aims at providing students with ideas of Geospatial Modeling on environmental issues including sustainable development and ecosystem management from community scale to global, as well as basic practical skills to develop geospatial models for the purpose.

Learning Outcomes :

The students on the completion of this course would be able to :

1. Utilize the basic functions of GIS and the fundamental procedures for Remote Sensing data processing to develop geospatial models.
2. Apply geospatial modeling for environmental issues including sustainable development and ecosystem management.
3. Acquire practical skills for GIS operation and Remote Sensing image processing for geospatial modeling on environmental issues.
4. Acquire practical skills to develop geospatial models for environmental issues.

Prerequisite: None

Course Outline:

I. Introduction
   1. Introduction of the course
   2. Overview of Geospatial Modeling for Environment

II. Review of GIS and Remote Sensing
   1. Data and Software
   2. Functions of GIS
   3. Procedures of Remote Sensing
   4. GIS modeling

III. Land Use Change and Modeling
   1. Land Cover/Land Use Classification
   2. Land Use and Land Use Change
   3. Land Use Change Model

IV. Ecosystem Management and Modeling
   1. Issues on Ecosystem Management
   2. Biodiversity Analysis and Modeling
   3. Landscape Analysis and Modeling

V. Global Environment and Modeling
1. Issues on Global Environment and Climate Change
2. Datasets for Global Environment
3. Geospatial Modeling for Climate Change Adaptation

Laboratory Session(s):

1. Introduction to TerrSet(Software)
2. Basic GIS Analysis
3. Basic Image Processing
4. Data Handling
5. Modeling for Land Use Change
6. Modeling for Ecosystem Management
7. Modeling for Global Environment

Learning Resources:

Textbooks: No designated textbook, but class notes and handouts will be provided.

Reference Books:None
Journals:
Environmental monitoring and software, Elsevier
Ecological modeling, Elsevier
Applied geography, Elsevier

Others:

J. R. Eastman. TerrSet Manual, Clark lab, Clark University, U.S.A, 2016

J. R. Eastman. TerrSet geospatial monitoring and modeling system: Tutorial, Clark lab, Clark University, U.S.A, 2016

Teaching and Learning Methods:

1. **Lectures and class discussion**: Students will receive the lecture notes and the lecture schedule at the beginning of the course, and are requested to read the lecture notes before the class.
2. **Laboratory sessions**: The laboratory instruction, which provide a basic guideline for students to learn and be familiar with the software, will be provided. Students are requested to understand the algorithm of each operation so that they can apply the skills with other software applications. Students are requested to submit a laboratory report for each session.

Time Distribution and Study Load:

Lecture: 15 Hrs

Laboratory: 45 Hrs
Self-study: 60 Hrs

Evaluation Scheme:

Laboratory reports: 40%
Mid-semester exam (closed book): 30%
Final exam (closed book): 30%

In the examination, an "A" would be awarded if a student can elaborate the knowledge learned in the class by giving his/her own skills for using RS technology to obtain information on the earth in various applications. A "B" would be awarded if a student shows an overall understanding of all give topics, a "C" would be given if a student meets below average expectation on both knowledge acquired and analysis. A "D" would be given if a student does not meet basis expectations in understanding and analyzing the topics and issues presented in course.

Instructor(s): Dr. Sarawut Ninsawat (10%) + Affiliated Faculty (90%)