

CA6241: GEOGRAPHIC DATA MANAGEMENT AND PLANNING ANALYSIS

Effective Term

Semester A 2025/26

Part I Course Overview

Course Title

Geographic Data Management and Planning Analysis

Subject Code

CA - Civil and Architectural Engineering

Course Number

6241

Academic Unit

Architecture and Civil Engineering (CA)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

P5, P6 - Postgraduate Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

To understand the Geographic Information Science principles that underlie the development of Geographic Information Systems (GIS) software and its intelligent use; to demonstrate how geographic information systems be applied to tackle problems encountered in geospatial, environmental and land use planning applications; to understand techniques, data sources, and skills for analyzing regions as economic, social, and spatial systems; to introduce systems modeling, benefit-cost analysis, budgetary analysis, decision analysis, and forecasting techniques for analyzing situations that require a planning response.

Course Intended Learning Outcomes (CILOs)

| CILOs | Weighting (if app.) | DEC-A1 | DEC-A2 | DEC-A3 |
|--|---------------------|--------|--------|--------|
| 1 Discover the Geographic Information Science for land use planning urban demand and asset management etc; | | x | | |
| 2 Apply methods for analyzing situations that require a planning response; | | x | | |
| 3 Discover the techniques for analyzing cities and regions as economic, social, and spatial systems; | | x | x | |
| 4 Explore the applications and potentials of GIS in real contexts. | | x | x | |

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

| LTAs | Brief Description | CILO No. | Hours/week (if applicable) |
|--------------------------|--|------------|----------------------------|
| 1 Lectures and tutorials | On topics and techniques related to specific geographic attributes | 1, 2, 3 | |
| 2 Case studies | In class exercise and a set of applications to complete one case project | 1, 2, 3, 4 | |

Additional Information for LTAs

Semester Hours: 3 hours per week

Lecture/Tutorial/Laboratory Mix: Lecture (2); Tutorial (1); Laboratory (0)

Assessment Tasks / Activities (ATs)

| | ATs | CILO No. | Weighting (%) | Remarks ("- " for nil entry) | Allow Use of GenAI? |
|---|--------------------|------------|---------------|------------------------------|---------------------|
| 1 | Mid-term Quiz | 1, 2, 3, 4 | 30 | - | No |
| 2 | Project/assignment | 1, 2, 3, 4 | 70 | - | Yes |

Continuous Assessment (%)

100

Examination (%)

0

Minimum Continuous Assessment Passing Requirement (%)

40

Assessment Rubrics (AR)**Assessment Task**

Mid-term Quiz (Applicable to students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

ABILITY to UNDERSTAND basic knowledge about GIS and IDENTIFY key techniques to solve specific issues

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Project/assignment (Applicable to students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

ABILITY to ORGANIZE a set of geographic data outputs and PRESENT design/planning products effectively

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Mid-term Quiz (Applicable to students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

ABILITY to UNDERSTAND basic knowledge about GIS and IDENTIFY key techniques to solve specific issues

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Project/assignment (Applicable to students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

ABILITY to ORGANIZE a set of geographic data outputs and PRESENT design/planning products effectively

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic

Failure

(F) Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Geographic Information Science principles that underlie the development of Geographic Information Systems (GIS) software and its intelligent use; application of geographic information systems for geospatial, environmental and land use planning applications; techniques, data sources, and skills for analyzing regions as economic, social, and spatial systems; systems modeling, benefit-cost analysis, budgetary analysis, decision analysis, and forecasting techniques for analyzing situations that require a planning response

Reading List

Compulsory Readings

| Title | |
|-------|-----|
| 1 | Nil |

Additional Readings

| Title | |
|-------|--|
| 1 | Socio-economic applications of geographic information science / editors David Kidner, Gary Higgs and Sean White. London ; New York : Taylor & Francis, 2003, c2002. |
| 2 | Foundations of geographic information science / edited by Matt Duckham, Michael F. Goodchild and Michael F. Worboys. London ; New York : Taylor & Francis, 2003. |
| 3 | GIS, spatial analysis, and modeling / David J. Maguire, Michael Batty, and Michael F. Goodchild, editors. Redlands, Calif. : ESRI Press, 2005. |
| 4 | Planning support systems in practice / Stan Geertman, John Stillwell, editors. Berlin ; New York : Springer, c2003. |
| 5 | Geographic information systems for transportation : principles and applications / Harvey J. Miller, Shih-Lung Shaw. Oxford ; New York : Oxford University Press, 2001. |
| 6 | Karen C. Hanna, R. Brian Culpepper. GIS in site design : new tools for design professionals. New York : Wiley, c1998. |