

<p>Kingdom of Saudi Arabia Ministry of Higher Education Qassim University College of Engineering</p>		المملكة العربية السعودية وزارة التعليم العالي جامعة القصيم كلية الهندسة
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CE 630 GIS and Natural Resources Management

College: Engineering

Department: Civil

First: Course Definition

1- Course Code : CE 630

2- Units: 3

3 – Semester

4 -Prerequisite

5- Co-requisite

6- Location (if not on main Campus):

Second: Course Objectives

- 1- To develop understanding of the concepts, theories of GIS basic Technology.
- 2- To develop basic understanding of how geographic data can be presented.
- 3- To understand the methodology of developing data structures in GIS.
- 4- To develop basic data base for natural resources GIS.
- 5- To perform spatial analysis using GIS for modeling natural resources data.
- 6- To develop GIS data visualizing and presenting natural resources data.
- 7- To use GIS software for analysis of natural resources applications.

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Third: Course Specifications

1- Topics to be covered

Subject	No of Weeks	Units
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Introduction to GIS	1	3
Basic GIS technology	2	6
Data Sources for GIS in Water Resources	2	6
Data structures	1	3
Database management	2	6
Spatial analysis, and modeling	2	6
Visualization and display of natural resource data	2	6
Case study in watershed and natural resource management	2	6

2- Course components (Total hrs in the Semester): 42

Lecture	Exercise	Other
42	-	0

3- Intended Learning Outcomes of the Course (ILO's)

a. Knowledge

i) Description of the knowledge to be acquired:

- List the basic GIS terminology.
- Define the data sources of GIS.
- List the used GIS data structures.
- Describe the process used building database management.
- Define spatial analysis steps.

ii) Teaching strategies to be used to develop that knowledge

- Class lectures.
- Term projects.
- Students' presentations.
- Group discussion.

iii) Methods of assessment of knowledge acquired

- Exams.
- Quizzes.
- Homework assignments.
- Term projects.

b- Cognitive (Intellectual) Skills

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i) Cognitive skills to be developed

- Identify the GIS data sources in Water resources.
- Identify the basic GIS data structure for natural resources GIS.
- Examine the method for presenting geographic data.
- Recognize the spatial analysis using GIS for modeling and displaying natural resources data.

ii) Teaching strategies to be used to develop these cognitive skills

- Class lectures.
- Case studies analysis.
- Lab assignments.
- Term projects.

iii) Methods of assessment of students cognitive skills

- Students' seminars and presentations.
- Term projects.
- Written reports.

c. Interpersonal Skills and Responsibility

i) Description of the interpersonal skills and capacity to carry responsibility to be developed

- Suggest alternative schemes for GIS data structure.
- Suggest alternative schemes for base map creation method.
- Evaluate the GIS data structure.
- Suggest alternative schemes for visualizing Geographic Data.

ii) Teaching strategies to be used to develop these skills

- Class lectures.
- Case studies analysis.
- Term projects.

iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility

- Students' seminars and presentations.
- Term projects.
- Written reports.

d. Communication, Information Technology and Numerical Skills

i) Description of the skills to be developed in this domain

- Literature research.
- Problems modeling.

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- Utilization of computer applications in analysis and design.

- ii) Teaching strategies to be used to develop these skills**
- Class lectures.
 - Case studies analysis.
 - Computer lab sessions.
 - Term projects.
- iii) Methods of assessment of students numerical and communication skills**
- Term project.
 - Written reports.
 - Students' seminars and presentations.

e. Psychomotor (if applicable) & Other Non-cognitive Skills

- i) Description of the psychomotor or other skills to be developed and the level of performance required**
- NA
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- ii) Teaching strategies to be used to develop these skills-**
- NA
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- iii) Methods of assessment of student's psychomotor skills**
- NA
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4- Student Assessment Schedule

Serial	Assessment tool (test, group project, examination etc.)	Week due	Weight
1	Term Project – 1	3 rd	15 %
2	Mid Term Exam -1	7 th	15 %
3	Term Project – 2	10 th	15 %
4	Term Project – 3	13 th	15 %
5	Final Exam	16 th	40 %

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5- Student Support

- Providing electronic library of textbooks and scientific periodicals.
- Providing the necessary computer applications for the course (Licenses of ARCGIS software).

6- Learning Resources

- i) Essential Books (References)**
- Lyon, J. "GIS for Water Resource and Watershed Management," CRC Press; 1 edition, 2002.
 - Morain S. " GIS Solutions in Natural Resources Managements,"1/e, OnWord, 1998.
 - Lang L. " Managing natural Resources with GIS," ESRI Press, 1998.

- ii) Course Note**
- NA
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- iii) Recommended Books**
- ESRI "GIS for Environmental Management," ESRI Press, 2006.
 - Ormsby T., Napoleon, E. J., Burke,R., Groessl,C., and Bowden, L. "Getting to Know ArcGIS: DESKTOP," 2/e. ESRI Press, 2010.

- iv) Electronic Books & Web Sites:**
- Scientific journals and forums.
 - Instructor's instruction
 - <http://www.esri.com/>
 - <http://www.usgs.gov/>

- v) Periodicals**
- International Journal of Geographic Information Science.

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- Transactions in GIS
- Computer, Environment and Urban Systems

7- Course Evaluation and Improvement Processes

- i) Strategies for Obtaining Student Feedback on Effectiveness of Teaching***
- Students' questioners.
 - Students' evaluation of course and instructor.
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- ii) Other Strategies for Evaluation of Teaching by the Instructor or by the Department***
- Public faculty seminars.
 - Assessment by external evaluators of students achievements.
 - Instructor (Course) Report

- iii) Processes for Improvement of Teaching***
- Assessment of students' work by external examiners.
 - Analysis of students' evaluation of course and instructor.
 - Seminars by industry professionals.

- iv) Processes for verifying standards of student achievement (e.g. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)***
- Assessment of students' work by external examiners.
 - Analysis of students' evaluation of course and instructor.
 - Seminars by industry professionals.
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- v) Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.***
- Assessment and evaluation of the level of achieving the course outcomes through a continuous improvement process (part of a quality assurance system established by the university),
 - Consequently, actions are to be taken to improve the course delivery when necessary.
 - Review of the course objectives, outcomes and curriculum every 2 years.

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