



American University of Ras Al Khaimah

AURAK Syllabus

Course Title: Geographical Information Systems

Course Code: CIEN 265.01

Credit Hours: 2 (1 Class lecture and 3 Lab. (practical))

Method of Instruction:

- This course is taught using the face-to-face method of instruction
- Instructor will teach the topics of the course emphasizing on related course specific learning outcomes, while students will take notes and read in the textbook.
- Student course learning outcomes will be measured by homework assignments, quizzes, mid-term and final exams.
- At the end of each topic, an open discussion will be made between instructor and students in class to revise the topic to ensure that the learning objectives are fulfilled
- During the class, difficult problems will be solved by the instructor.
- Each student will be assigned to solve a comprehensive problem. Instructor will guide the students during the class.

Prerequisite course(s) and/or co-requisite courses, if applicable: Pre-requisite CSCI 112

Faculty Name: Engr. Wlla Al-Mhairat

Contact Information and Office Hours:

Email: Wlla.almhairat@aurak.ac.ae

Office: G 344

Office Hours: U 2:00-3:00 PM and T 3:30 PM- 4:30 PM or by appointment

Course Description:

GIS (Geographic Information Systems) is a computer-based tool that uses spatial (geographic) data to analyze and solve real-world problems. This course is designed to introduce the student to the basic principles and techniques of GIS. The lab material will emphasize GIS data collection, entry, storage, analysis, and output using ArcGIS.

Additional Information about the Course: This course is NOT an online course. This is a second year level course exposes students to the principles of GIS by using spatial (geographic) data to analyze and solve real-world problems.

Course Textbooks and Materials:

- Text Book: Kang-Tsung Chang (2008). *Introduction to Geographic Information Systems*, 4th edition, McGraw-Hill, ISBN: 9780073051154
- Resources: John R. Jensen and Ryan R. Jensen (2012). *Introductory Geographic Information Systems*, 1st edition, Pearson, ISBN-13: 978-0136147763.

Other Resources:

Class Notes & Handouts (on Blackboard)

Web Resources:

https://ocw.unihe.org/pluginfile.php/8523/mod_resource/content/3/QGIS_and_Open_Data_for_Hydrological_Applications_Exercise_Manual_v3.4.1b.pdf

<https://www.youtube.com/watch?v=7nf8tSGIP4M>

Course Learning Outcomes (CLOs)

Course Learning Outcomes At the end of this course, students should be able to:	
CLO 1	Demonstrate ability to use GIS data, analysis and techniques.
CLO 2	Apply GIS concepts in infrastructure projects and managements.
CLO 3	Interpret the technical language of GIS.

Assessment Activities

The dates for quizzes, exams, and submission of assignments are specified in the schedule. You will be graded in this class based on the number of points you earn for quizzes, exams written assignments, or other activities, including your class participation. Keep track of your scores in Blackboard.

Assessment Activities and Grading Weight	Course Activities / Assignments 20%	Quizzes 10%	Mid-term Exam 20%	(Other Activities, e.g., Class Participation, Portfolio, Presentations) 10%	Final Exam 40%
CLO 1	X		X		X
CLO 2	X		X		X
CLO 3	X	X	X	X	X

Program Learning Outcomes (PLOs) and Mapping Course to Program Outcomes

Please see the APPENDIX for the Course to Program Outcomes Mapping.

Grading Scale:

The grading system and scale for AURAK, as established by the Board of Trustees, is as follows:

AURAK Grading System and Scale		
Grade	Percentage Scores	Grade Points
A	95-100	4
A-	90-94	3.7
B+	86-89	3.3
B	83-85	3
B-	80-82	2.7
C+	76-79	2.3
C	73-75	2
C-	70-72	1.7
D+	66-69	1.3
D	60-65	1
F	0-59	0

Weekly Course Information

Schedule of Course Topics, Required Reading, and Assignments and Assessments (Including scheduling of laboratory, studio, external visit, and other non-classroom meeting sessions, as appropriate)				
Week	Topic	Required Readings	Assignment, Assessment (with grade weighting) & Due Date	Mapping of CLOs to Assessments
1	Course introduction, Define GIS, Origin of GIS, Why is GIS important? ,History and development of GIS.	Chapter 1		
2	Map Layout, Coordinate Systems, Map Scales, Map Projections, Geometric Transformation.	Chapter 2	HW # 1 2% Thursday 10 Sep	CLO 1, 2
3	Cartographic principles, Categorization, Map Layout	Chapter2	HW # 2 2% Thursday 17 Sep	CLO 1, 2
4	Data Modeling: Vector Model, Topology, Database Issues	Chapter 3,4	Quiz 1 5% 24 Sep 2020	CLO 1, 2

5	Data Modeling: Working With Tables	Chapter 3,4	HW # 3 4% Thursday 1 Oct	CLO 1, 2
6	Data Input	Chapter 6		
7	Mid-Term		Mid-term 20% Thursday 15 Oct 2:00-3:00 pm	
8	Geometric Transformation	Chapter 7		
9	Attribute data input and management	Chapter 9	HW # 4 2% Thursday 29 Oct.	CLO 2, 3
10	Spatial Analysis: Map Algebra	Chapter 8,12	Quiz 2 5% Thursday 5 Nov.	CLO 2, 3

11	Spatial Analysis: Vector Overlay, Set Theory	Chapter 8,12	HW # 5 2% Thursday 12 Nov.	CLO 2, 3
12	Spatial Analysis: Vector Overlay, Buffering	Chapter 12	HW # 6 4% Thursday 19 Nov.	CLO 2, 3
13	Applications for GIS, GIS Technologies: Web Based, Mobile Apps, UAV's	Chapter 17	HW # 7 4% Thursday 26 Nov.	
14	Term project		Term project Presentation 10% Tuesday 3 Dec	CLO 2, 3
15	Final Exam	Chapter 18	Final Exam 40% Thursday 10 Dec. 2.00-4.00 pm	

Attendance Policy

University policy is that students are to attend all classes and to arrive on time. Students are required to:

- Attend all learning and teaching sessions associated with their program of study.
- Notify their course instructors in advance (in person, by phone or e-mail) that they will be absent from time-tabled class sessions.
- Obtain prior permission from their instructor or course manager, for planned absences of two or more consecutive class sessions during the semester.
- Provide a medical certificate or other corroborating evidence to explain their absence, if required by the University.

Unsatisfactory student attendance includes failure to regularly attend learning and teaching sessions without providing a satisfactory reason to instructors for absence and/or persistent late arrival at, or early departure from, learning and teaching sessions. Where a student fails to attend classes for **four or more weeks cumulatively**, or where a recurring pattern of non-attendance is observed over the course of the semester, the instructor has the option of deeming that the student has failed the course, in which case that student may receive an "F (Fail)" or "U (Unsatisfactory)" grade, as appropriate. At this point, and at the instructor's recommendation, the dean also has the authority to instruct the registrar to remove or withdraw the student from the course.

Disability Accommodations

Students with disabilities may find they require additional support, services, or considerations. AURAK will endeavor to support students with disabilities or special needs where resources are available. Accommodations will be provided, for students with verified needs, allowing equal access to educational facilities, programs, services, and activities at AURAK. Disability Accommodations are never applied retroactively – only students who have previously requested and have been approved for supporting accommodations can have them apply to a given academic semester/course. Students needing support must make the request from the Department of Counseling, Testing, and Disability Services located in Building H.

Other Relevant Policies

A. Academic Integrity

The Honor Code

The American University of Ras Al Khaimah strongly supports the concept of academic integrity and expects students and all other members of the AURAK community to be honest in all academic endeavors. The AURAK Honor Code can be found in the AURAK Student Handbook.

The role of the Honor Code and associated Academic Integrity Policy is to protect the academic integrity of the university, encourage consistent ethical behavior among students, and foster a climate of honorable academic achievement. The Honor Code is an integral part of university life and students are responsible, therefore, for understanding and abiding by the code's provisions. While a student's commitment to honesty and personal integrity is assumed and expected, this Code and associated policy and procedures provides clarity of expectations.

Expectations

Cheating, plagiarism, and all other forms of academic fraud are unacceptable; they are serious violations of university policy. AURAK expects all students to be familiar with university policies on academic integrity. The university will not accept a claim of ignorance – either of the policy itself or of what constitutes academic fraud – as a valid defense against such a charge.

Violations of Academic Integrity

Violations of academic integrity constitute academic fraud. Academic fraud consists of any actions that serves to undermine the integrity of the academic process or that gives the student an unfair advantage, including:

- Inspecting, duplicating or distributing test materials without authorization.
- Cheating, attempting to cheat, or assisting others to cheat – relevant here is the prohibition on being in possession of a mobile telephone or similar electronic device during a test or examination. In case such devices are found with a student, the student will be deemed to have attempted to cheat and will be subject to disciplinary action under the Student Academic Integrity Policy.
- Altering work after it has been submitted for a grade.
- Plagiarizing.
- Using or attempting to use anything that constitutes unauthorized assistance.
- Fabricating, falsifying, distorting, or inventing any information, documentation, or citation.

Plagiarism

One of the most common violations of academic integrity is plagiarism. Plagiarism can be intentional or unintentional. However, since each student is responsible for knowing what constitutes plagiarism, unintentional plagiarism is as unacceptable as intentional plagiarism and thus will bring the same penalties.

Plagiarism – submitting the work of others as one’s own - is a serious offense. In the academic world, plagiarism is theft. Information from sources – whether quoted, paraphrased, or summarized – must be given credit through specific citations. When a student paraphrases a work, it is still necessary to cite the original source. Merely rearranging a sentence or changing a few words is not sufficient. The citation style should be appropriate for the discipline and should clearly indicate the beginning and ending of the referenced material. All sources used in the preparation of an academic paper must also be listed with full bibliographic details at the end of the paper, as appropriate in the discipline.

Faculty and Student Expectations

- Every student, faculty member, and administrator is responsible for upholding the highest standards of academic integrity. Every member of the AURAK community shall honor the spirit of this policy by refusing to tolerate academic fraud.
- It is the responsibility of the instructor to provide students with additional guidelines for what constitutes “authorized” and “unauthorized” assistance.
- It is the responsibility of every student to see clarification if in doubt about what constitutes “authorized” and “unauthorized” assistance. In cases involving collaborative work, all students within the collaborative group may be held responsible for violating the code if any member of the group receives, accepts, or utilizes "unauthorized" assistance.
- Students are required to obtain permission prior to submitting work, any part of which was previously or will be submitted in another course. The instructor has the option of accepting, rejecting, or requiring modification of the content of previously or simultaneously submitted work.

A student who suspects that a violation of academic integrity has occurred should report the violation to the dean or to the Office of the Provost. In this report, the student should describe any action taken, such as talking with the person involved or with a faculty or staff member. Every effort will be made to preserve the anonymity of the student reporting the incident;

Possible penalties for academic fraud include: Formal warning, Reduction in grade for the assignment, Reduction in the grade for the course, A failing grade for the assignment, A failing grade (F) in the course, and/or Dismissal or Expulsion from the University.

Please refer to the relevant section in the *Student Handbook* and ensure a clear understanding of the provisions of the University Honor Code and the Student Academic Integrity Policy.

B. Concerns about grades or other course matters.

Students are responsible for their learning experiences. If you are concerned about a class matter, first discuss it with the instructor. If the matter is not resolved, the next step is to meet with the Chair of the department in which the course is taught. If you still have a concern, meet with the Dean of the school in which the course is taught. The matter is likely to be resolved

before it reaches that point, but if it is not, then visit the Associate Provost for Academic and Student Affairs. Students who decide to “jump to the top” will be referred “back” to the appropriate next step.

C. Assignments

University policy is that assignments are due on the date assigned. Instructors may refuse to accept late assignments or lower the grade that would be otherwise given.

D. Mobile Phones

All mobile phones, pagers and/or other communication devices should be turned off before entering the classroom. Students may NOT have mobile telephone or other electronic devices in their possession while completing examinations. Any violation will be deemed as having attempted to cheat.

E. Diversity and the Use of English

English is the common language of the AURAK campus for everyone. It is the only language to be used in the classroom. AURAK brings together students and faculty from diverse cultural and linguistic backgrounds, which is one of the strengths of the university. This diversity provides an opportunity to share our different experiences and enlarge our understanding of the world.

APPENDIX

Program Learning Outcomes At the completion of the program, students should be able to:	
PLO 1	Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
PLO 2	Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
PLO 3	Communicate effectively with a range of audiences
PLO 4	Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
PLO 5	Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
PLO6	Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
PLO7	Acquire and apply new knowledge as needed, using appropriate learning strategies

Mapping Course Learning Outcomes to Program Learning Outcomes

The learning outcomes of this course contribute to meeting one or more of the program learning outcomes as shown below, with the contribution designated as “high”, “medium”, or “low”:							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO7
CLO 1	High						
CLO 2	Medium						
CLO 3	Medium						

Mapping ABET Standards to Program Learning Outcomes Addressed in the Course

<i>ABET Standards (1-7)</i>	<i>Program Learning Outcome Addressed in the Course</i>	<i>Program Learning Outcomes</i>
1	X	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2		An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3		An ability to communicate effectively with a range of audiences
4		An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5		An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6		An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7		An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.