Course Specifications

Course Title:	**Geographic Information Systems**
Course Code:	**536CIS-3**
Program:	**Bachelor of Information System**
Department:	**Department of IS**
College:	**College of Computer Science and Information Systems**
Institution:	**Najran University**

Table of Contents

A. Course Identification

1. Credit hours:	3 (2, 2, 1)
2. Course type	
a.	University ☐ College ☐ Department ☑ Others ☐
b.	Required ☑ Elective ☐
3. Level/year at which this course is offered:	Level 9/Year 5
4. Pre-requisites for this course (if any)**:**	NA
5. Co-requisites for this course (if any)**:**	N/A

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	75	100%
2	**Blended**		
3	**E-learning**		
4	**Correspondence**		
5	**Other**		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	30
2	**Laboratory/Studio**	30
3	**Tutorial**	15
4	**Others** (specify)	
	Total	**75**
Other Learning Hours*		
1	**Study**	30
2	**Assignments**	7
3	**Library**	8
4	**Projects/Research Essays/Theses**	
5	**Others** (specify)	
	Total	**45**

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

This course is to introduce students to the fundamentals of Geographic Information Systems (GIS) including basic cartographic principles, map scales coordinate systems and map projections. Students learn how to use GIS software tools to perform basic GIS tasks such as accessing, displaying, querying,

and editing geographic data. In the course, students will learn the core GIS skills they need to support the organizations' missions using terminology, exercise scenarios, and data relevant to many industries. The course focus on giving the students basic understanding for representation and analysis of spatial elements through a theoretical and practical approach. The course covers topics like definitions of GIS as a tool, projections and geographical reference systems, digital geographical data (maps, images and tables), basic analysis of data in vector and raster format, presentation of geographical data in map format using applications at regional and local scales.

2. Course Main Objective

To provide students with fundamental concepts, skills of geographic information systems

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1	Explain the nature and components of GIS.	K1
1.2	Discuss the applications of GIS in a variety of fields.	K1,K2
1.3		
2	**Skills :**	
2.1	Compare of different map projections, coordinate systems, and geodesic reference systems	S1,S2
2.2	Develop fundamental GIS skills in a variety of areas such as data conversion and map symbology.	S2,S3
2.3	Design maps using GIS	S1,S2,S4
2.3		
3	**Competence:**	
3.1	Develop leadership and teamwork skills in the implementation of the GIS works.	C1,C2
3.2	Appraise the self-learning and judgement skills regarding professional behavior and immoral practices.	C3
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction: Introduction to Geographic Information and GIS.	8
2	Data Models: Data models, map basics, vector data – point, line and area.	5
3	Geodesy: Basic geodesy, datums,	4
4	Map Projections: coordinate systems, map projections.	9
5	Data Entry and Editing: Data sources, entry and editing, metadata, map transformations.	4
6	Tables and Relational Databases	10
7	Basic Spatial Analysis	4
8	Topics in Raster Analysis	10
9	Interpolation and Spatial Estimation	10
10	Data Standards and Quality	5
11	Future Trends	6
	Total	75

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.1	Explain the nature and components of GIS.	- Ask students to download ArcGIS to explain the components of GIS. - Ask student to search the internet to discuss 10 practical applications of GIS. - Showing and delivering PDF chapters in the class to discuss GIS applications.	Following methods are used to assess student's knowledge acquired in this course. - Class Quizzes. - Assignment. - Midterm exam (Each exam consists of multiple choice questions, true/false, fill in the blanks, and theoretical questions.) - Final Exam
1.2	Discuss the applications of GIS in a variety of fields.		
2.0	**Skills**		
2.1	Compare of different map projections, coordinate systems, and geodesic reference systems	- Ask students to compare the GIS software in the market and provide features for each software. - Solving and developing issues related to data conversion using GIS tools for students to make them more familiar with various GIS software. - Let students solve digitizing and symbology problems in small groups and giving correction on their solution during class. - Use ArcGIS to **design** various maps based on different requirements	Following methods are used to assess student's skills in this course. - Class Quizzes. - Assignment. - Midterm exam (Each exam consists of multiple choice questions, true/false, fill in the blanks, and theoretical questions. - Final Exam - Midterm lab exam - Final lab exam
2.2	Develop fundamental GIS skills in a variety of areas such as data conversion and map symbology.		
2.3	Design maps using GIS		
3.0	**Competence**		
3.1	Develop leadership and teamwork skills in the implementation of the GIS works.	- Let students solve geographical problems in small groups and giving correction on their solution during class. - Motivating students to be active during class by asking questions regularly. - Let students present their work after group discussion session.	- Assignment - Homework - Student Presentation

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.2	Appraise the self-learning and judgement skills regarding professional behavior and immoral practices.	- Motivating students to work in the home, to search from the internet, to read related reference books by giving them assignments related to GIS. - Let students present their work after group discussion session.	- Assignment - Homework - Student Presentation
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2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments\Honeworks	Every two weeks	10%
2	Mid Term Exam-I	TBA	15%
3	Mid Term Exam-II	TBA	15%
4	Makeup Mid Term Exam (*Only for exceptional cases*)	TBA	
5	Mid Lab Exam	TBA	10%
6	Final Lab Exam	TBA	10%
7	Final Exam		40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

During the whole semester, 10 hours/week are reserved for students to guide them, to help them, to explain them topic which is not clear to them etc.
Student also visits his academic advisor at least two times during semester to get marks of exams and advisors consult student and discuss with him about any issues of the course.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	" GIS Fundamentals: A First Text on Geographic Information Systems, Fifth Edition 5th Edition by Paul Bolstad
Essential References Materials	• Chang Kang-tsung, "Introduction to geographic information systems", Book, Mc-Graw Hill companies, 3rd edition, ISBN 0-07-060629-3, 2016. • Building a GIS: System Architecture Design Strategies for Managers, Second Edition, by Dave Peter

Electronic Materials	• http://www.esri.com/what-is-gis/learn-gis • http://ocw.mit.edu/courses/urban-studies-and-planning/11-521-spatial-database-management-and-advanced-geographic-information-systems-spring-2003/index.htm
Other Learning Materials	N/A

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Lecture Rooms with 20 seats and a whiteboard or a smart board. Lab with 20 PCs and projector
Technology Resources (AV, data show, Smart Board, software, etc.)	Desktop/ Laptop computer Multimedia Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	A File cabinet to keep Class Stuff, Markers, papers and students Files, and a printer to print program screenshots.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Collecting students' questionnaire about the faculty and teaching methods.	Students	Questionnaire
Collecting students' suggestions to facilitate more during the class.	Students	Verbal discussion
Student's questioner once during semester about course learning outcomes.	Students	Questionnaire
Feedback once the student visit his advisor and take marks	Students	Verbal discussion
Extent of achievement of course learning outcomes	Quality Unit	Using CLO assessment sheet
Feedback from coordinator	Faculty	Verbal discussion

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Department Council
Reference No.	Session No. 10 (441-38-43300)
Date	17/02/2020