



THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

Department of Urban and Regional Planning

URP 510 – Geographical Information Systems (GIS) in Urban and Regional Planning

COURSE PARTICULARS

Course Code: URP 508

Course Title: Geographical Information Systems (GIS) in Urban and Regional Planning

No. of Units: 3

Course Duration: One hour of theory and Six hours of practical per week for 15 weeks.

Status: Compulsory

Course Email Address: urp510@futa.edu.ng

Course Webpage: <http://www.urp.futa.edu.ng/courseschedule.php?coursecode=URP%510>

Prerequisite: NIL

COURSE INSTRUCTORS

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COURSE DESCRIPTION

The goal of this course is to introduce geographic information systems (GIS) to students in Urban and Regional Planning. GIS is a contemporary tool used in various disciplines. However, in Urban and Regional Planning, GIS is useful for urban analysis, land use analysis, flooding, coastal zone management, urban renewal, transportation planning, and disaster management among others. As a practical course, the focus is to impart and enhance their analytical skills using GIS analytical tools for presentation, communication and decision making which forms the bedrock of Urban Planning as a profession. Topics to be covered include Introduction to GIS, Database structures and formats, data inputting, editing and topology in GIS, Integration of spatial and non-spatial data, spatial analysis, Remote Sensing and GIS integration and application of GIS and Remote Sensing in Urban & Regional Planning.

COURSE OBJECTIVES

The objectives of this course are to:

- This course would provide the participants with a full understanding of GIS concepts and principles and how it can be used for urban analysis; and
- Exploring basic GIS functionality, GIS database and as well perform various analysis to aid decision making in urban planning context.

COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will be able to:

(Knowledge based)

- Understand vector and raster data models and their application
- explain the basic concepts of geodatabase and editing datasets
- understand the methods of carrying out spatial analysis
- explain the integration of GIS and Remote Sensing data, and
- apply GIS and Remote Sensing to urban analysis;

(Skills)

- add maps to ArcGIS
- work with raster dataset (images from different sources including Google Earth)
- work with map layout to produce GIS maps
- georeferencing of raster data
- impute and edit attributes and working with relational database.

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Class Attendance	5%
Assignments	15%
Test	20%
<u>Final Examination</u>	<u>60%</u>
<u>TOTAL</u>	<u>100%</u>

GENERAL INSTRUCTIONS

Attendance: It is expected that every student will be in class for lectures and also participate in all practical exercises. Attendance records will be kept and used to determine each person's qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with any of the instructors, indicating the reason for the absence.

Academic Integrity: Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person's work and submit it as your own; that is plagiarism. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in

accordance with the guidelines for handling students' misconduct as spelt out in the Students' Handbook.

Assignments and Group Work: Students are expected to submit assignments as scheduled. Failure to submit an assignment as at when due will earn you zero for that assignment. Only under extenuating circumstances, for which a student has notified any of the instructors in advance, will late submission of assignments be permitted.

Code of Conduct in Lecture Rooms and Laboratories: Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, etc.) during lectures. Food and drinks are not permitted in the laboratories.

READING LIST

¹Bernhardsen, T. (1999): *Geographic Information Systems: An Introduction*. Second Edition. John Wiley & Sons. 428p.

¹David, M. (1996). *Geographic Information Systems: Socioeconomic applications*. Second Edition. Routededge, London & Newyork. 240p.

⁴Ornsby. T., Napoleon. E.J., Burke. R., Groessl. C., and Bowden. L (2010). *Getting to know ArcGIS 10*. Second Edition ESRI Press Redlands, USA. 592p.

⁴Weng. Q. (2010) *Remote Sensing and GIS Integration. Theories, Methods, and Applications*. McGrawHill Professional, New York, USA. 416p

¹Worboys, M. and Duckham. M. (2004). *GIS: A computing Perspective*. Second Edition. CRC Press. 448p.

Legend

- 1- Available in the University Library
- 2- Available in Departmental/School Libraries
- 3- Available on the Internet.
- 4- Available as Personal Collection
- 5- Available in local bookshops.

COURSE OUTLINE

Week	Topic	Remarks
1	Introduction to Geographic Information Systems (GIS)	During this first class, the expectation of the students from the course will also be documented.
2	Exploring the hardware and software requirements of GIS	This class will introduce students the GIS system, ArcGIS, ArcGIS Desktop applications
3 & 4	Exploring database structures and formats in GIS <ul style="list-style-type: none"> • Vector data structures • Raster data structures 	<p>The purpose of this topic is to expose students to variety of geographic datasets and ensure they understand and can classify them into vector and raster datasets.</p> <p>An objective of the topic is to ensure that students are able to work with feature datasets and raster datasets within the ArcGIS environment by performing simple GIS tasks</p>
5 & 6	Data inputting, editing and topology in GIS <ul style="list-style-type: none"> • Building geo-database • Creating features • Editing features and attributes • Making maps for presentation 	Students will be required to know and develop skills in how to organise data into a geo-database, creating and editing feature datasets and attributes by digitising, and geo-referencing raster datasets. In addition, students will learn how to make maps for presentation using ArcMap
7 & 8	Integration of spatial and non-spatial data	Students will work with tables from spreadsheets such as Microsoft Excel and load them into ArcGIS
MID-SEMESTER TEST		
9 & 10	Spatial Analysis <ul style="list-style-type: none"> • Querying data • Selecting features by attributes and location • Joining and relating tables • Preparing data for analysis • Buffering • Overlaying data • Calculating attribute values 	Students will be involved in using ArcGIS to query datasets and introduced to the basic concepts of Spatial Analysis. These will include identifying, selecting, finding, hyperlinking features, among others. These will enable the students to develop problem solving skills to solve urban and environmental problems

11 & 12	Remote Sensing and GIS data integration <ul style="list-style-type: none"> • Contributions of Remote Sensing to GIS • Contributions of GIS to Remote Sensing • Integration of Remote Sensing and GIS for Urban Analysis • Conceptual impediments and probable solutions 	Students are expected to understand the ways in which Remote Sensing and GIS technologies can be combined to enhance each other.
13 & 14	Application of Remote Sensing and GIS in Urban and Regional Planning <ul style="list-style-type: none"> • Urban renewal • Transportation • Land use • Coastal zone management • Environmental management 	The purpose here is to ensure students are able to make use of the skills they have learnt and apply them in varying aspects of Urban and Regional Planning
15	REVISION	This is the week preceding the final examination. At this time, evaluation will be done to assess how far the students' expectations for the course have been met.