COURSE CODE:	GIE-201		
COURSE NAME:	Introduction to GIS and Remote Sensing		
CREDIT HOURS:	Theory = 02	Practical = 01	Total = 03
CONTACT HOURS:	Theory = 32	Practical = 48	Total = 80
PREREQUISITE:	None		
MODE OF TEACHING:	Instruction: 2 hours of Lecture per week (67%) Lab Demonstration: 3 hours of Lab work per week (33%)		

Course Description:

This course has been designed to impart practical experience in use and interpretation of geographic/spatial data through GIS. The course will provide comprehensive instruction in the underlying concepts and principles of geographic information system (GIS) technology and its application to the analysis of environmental data. The focal point of the course includes fundamental understanding of spatial data acquisition, geo-processing, geostatistical methods; visualization, and querying of spatial data; network modeling, terrain mapping, and spatial analysis. Students are trained to become proficient in usage of ESRI ArcGIS 9.X software through extensive computer lab sessions.

TOPICS COVERED:

Week	Topic
1	Fundamentals of Remote Sensing, Electromagnetic Spectrum
2	History and data collection. Energy Sources, energy matter interaction in the atmosphere
3	History and platforms. Active and Passive remote sensing
4	Remote sensing of vegetation and landscape
5	Satellite Imageries, Image Processing: Image enhancement, Linear Stretch, Histogram equalization, Interpretation, visual interpretation, Preparation of thematic maps
6	Satellite Imageries, Image Processing: Image enhancement, Linear Stretch,

	Histogram equalization, Interpretation, visual interpretation
7	Satellite Imageries, Image Processing: Image enhancement, Linear Stretch, Histogram equalization, Interpretation, visual interpretation
8	Preparation of thematic maps
9	**Mid Semester Exam**
10	Fundamental of Geographic Information System (GIS)
11	Integration with other technologies and its importance
12	Data acquisition, analysis and output
13	Types of data used in GIS
14	Cartography
15	GIS applications in: Agriculture, Forestry, Fishery and wildlife.
16	GIS applications in: Agriculture, Forestry, Fishery and wildlife.
17	GIS applications in: Agriculture, Forestry, Fishery and wildlife.
18	**End Semester Exam**

Lab/Practical:

Week	**Practical**
1	Introduction to Software
2	Introduction to Software
3	Getting familiarization with Image processing and GIS software
4	Getting familiarization with Image processing and GIS software
5	Getting familiarization with Image processing and GIS software
6	Conversion of raster to vector data
7	Conversion of raster to vector data
8	Conversion of raster to vector data
9	**Mid Semester Exam**
10	Demonstration of GPS operations
11	Demonstration of GPS operations
12	Interpretation of satellite images for different application
13	Interpretation of satellite images for different application

14	Interpretation of satellite images for different application
15	Ground Truthing
16	Ground Truthing
17	Ground Truthing
18	**End Semester Exam**

Text and Material:

1. GIS Fundamentals: A First Text on Geographic Information Systems 6th Edition by Paul Bolstad, 2019
2. Aerial Photography, Photogeology, GIS, R.S. And Image Processing by Saiful-Islam Saif, 2014
3. Learning ArcGIS Pro 2: A beginner's guide to creating 2D and 3D maps and editing geospatial data with ArcGIS Pro, 2nd Edition by Tripp Corbin, 2020
4. Introduction to GIS. Campbell. McGraw-Hill Education.

ASSESMENT SYSTEM:

Theoretical/Instruction	**100%**
Assignments	10%
Quizzes	15%
Mid Semester Exam	25%
End Semester Exam	50%

Practical Work	**100%**
Lab Work	70%
Lab Exam/Projects	30%