COURSE CODE: **GIE-473**

COURSE NAME: **INTEGRATED GEO-TECHNOLOGIES**

CREDIT HOURS:
Theory = 02
Practical = 01
Total = 03

CONTACT HOURS:
Theory = 32
Practical = 48
Total = 80

PREREQUISITE: Nil

MODE OF TEACHING:

Instruction:	Two hours of lecture per week	67%
Practical:	Three hours of lab work per week	33%

COURSE DESCRIPTION:

Over the course of time students get to know about geospatial technologies at large and their application but the idea of a comprehensive user-friendly project development. In this course the students, are taught the basic of human computer interaction in a manner where all helping technologies can come together to streamline this process.

COURSE OBJECTIVES:

Upon successful completion of the course, the student will demonstrate competency by being able to:

a) Understand how various geo-technologies can come together in real life geo-informatics projects.

b) Assemble/make digital tools for field data collection

c) Manipulate gathered data in geospatial suites on their computers.

d) Streamline human computer interaction based on their knowledge of geospatial data gathering and management.

RELEVANT PROGRAM LEARNING OUTCOMES (PLOs):

The course is designed so that students will achieve the PLOs:

1	Engineering Knowledge:	☐	7	Ethics:	☐
2	Problem Analysis:	☐	8	Individual and Collaborative Team Work:	☐
3	Design/Development of Solutions:	☑	9	Communication:	☐
4	Investigation:	☐	10	Project Management:	☐
5	Tool Usage:	☑	11	Lifelong Learning:	☐
6	The Engineer and Society:	☐	12		

COURSE LEARNING OUTCOMES (CLO):

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

S No.	CLO	Domain	Taxonomy Level	PLO
1.	Design and implement a system to present solutions based on a blend of various geo-technologies	Cognitive	5	3
2.	Develop IoT based GI projects using optimal tools and techniques	Psychomotor	4	5

TOPICS COVERED:

Theory:

Week	Topic
1	Human computer interaction and geospatial technologies
2	Human understanding of space
3	Cartographic theory and practices
4	Computer mediated communication
5-6	User centered design
7	Usability engineering
8	Practicalities and techniques
9-10	Application planning
11-12	Practical cartography
13	Principles of HCI
14	Evaluation and deployment
15	Single user and multi-user environments AIoT (Artificial Intelligence of Things).
16	Examples from the field and industry Smart cities design and AIoT implementation.
17-18	**ESE**

Practical:

No.	Topics
1	ArcMap overview: for live data input
2	ArcGIS fundamental and extensions: for data input from spatial databases
3-4	GIS for managers: examples of HAZUS where live data makes more sense
5-6	ArcGIS specialist services: choice for IoT project areas
7	Cartographic representation and ArcGIS: Map layout design for data input (Desired output)
8-9	Geodatabase management and replication (ERD and databases)
10-11	ArcGIS for developer (Python for data fetching and integration into a Geodatabase)
12	ArcGIS data models for data processing
13-14	ArcGIS ArcWeb services for data publishing
15	ArcIMS
16	ArcGIS Server
17-18	**ESE**

TEXT AND MATERIAL:

Textbook(s):

a. Haklay, M. (2010). Interacting with geospatial technologies (pp. 91-106). Chichester, UK: Wiley-Blackwell.

b. Thurston, J., Moore, J. P., &Poiker, T. K. (2003). Integrated geospatial technologies: a guide to GPS, GIS, and data logging. John Wiley & Sons.

Reference Books:

a. McEwen, A., &Cassimally, H. (2013). Designing the internet of things. John Wiley & Sons.

b. Urbano, F., &Cagnacci, F. (2014). Spatial database for GPS wildlife tracking data: a practical guide to creating a data management system with PostgreSQL/PostGIS and R. Springer Science & Business Media.

ASSESMENT SYSTEM:

1. CLOs Assessment

Cognitive	**Psychomotor**	**Affective**
Spreadsheet	Rubrics	-

2. Relative Grading

Theoretical / Instruction			67%
	Assignments 10%		
	Quizzes 10%		
	Mid Semester Exam 30%		
	End Semester Exam 50%		
Practical Work			33%
Laboratory Work		*70%*	
	Laboratory Attendance 20%		
	Laboratory Report 50%		
	Laboratory Quiz 20%		
Viva/Quiz		*30%*	
Total			**100%**