



C. U. SHAH UNIVERSITY

Wadhwan City

FACULTY OF:-Computer Science

DEPARTMENT OF:-Master of Computer Application

SEMESTER:- V

CODE:- 5CS05MGS1

NAME: GEOGRAPHIC INFORMATION SYSTEM (GIS)

Teaching and Evaluation Scheme

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme								
		Th	Tu	Pr	Total		Theory				Practical (Marks)				Total
							Sessional Exam		University Exam		Internal		University		
							Marks	Hours	Marks	Hours	Pr/Viva	TW	Pr		
5CS05 MGS1	GEOGRAPHIC INFORMATION SYSTEM (GIS)	4	0	0	4	4	30	1.5	70	3	----	---	---	100	

Objectives:

To maximize the efficiency of decision making and planning, provide efficient means for data distribution and handling, integration of information from many sources, analysis of queries involving geographical reference data for generation of new information, update data quickly and at the minimum cost. The main objective of the course is to give a basic theoretical understanding of GIS concepts and technical issues.

Prerequisites:

Knowledge of Database Management, Basic Knowledge of Statistical Methods

Course outline:-

Sr. No.	Course content	No. of Hours
1	Introduction to GIS and Digital Geographic Data & Maps Introduction to Digital Geographic Data: Introduction to Geographic Information Systems, Developing spatial awareness Spatial Measurement level, Spatial Location and Reference, Spatial Patterns, Geographic Data Collection Map Basics: Abstract Nature of Maps, Map Scale, More Map Characteristics, Map Projection, Grid Systems for Process, Map Symbolism GIS Data Models: Computer File Structure, Database Structure, Graphic Representation of Entities and Attributes, GIS data Models for Multiple MAPS Compact storing of raster data,	12



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	Commercial Raster compaction products, Vector model, Compacting vector data models Vector model to represent Surfaces System models	
2	Input, Storage and Editing The Input Subsystem: Primary Data, Input Devices, Vector Input, Raster Input, Remote Sensing Data Input, GPS Data Input, Secondary data, Metadata and Metadata Standards. Data Storage and Editing: Storage of GIS Databases, Basic Error Types Consequences of Errors Error detection and editing Dealing with Projection Changes, Edge Matching, Conflation, Rubber Shitting	8
3	Analysis Elementary Spatial Analysis: GIS Data Query, Locating and identifying spacial objects Defining Spatial Characteristics, Working with Higher – Level Objectives Measurement: Measuring Length of Linear Objectives, Polygons, Shape and Distance Classification: Classification Principal, Elements of Reclassification, Neighborhood Functions, Roving Windows, Buffers Statistical Surfaces: Surface Mapping, Sampling the Statistical Surface, The DEM, Raster Surface, Interpolation, Terrain Reclassification, Slicing the Statistical Surface, Cut and Fill Spatial Arrangement Point, Line and Area Arrangement, Point Patterns, Thiessen Polygons, Area Patterns, Distance and Adjacency, Polygon Arrangement Measures, Linear Patterns, Directionality of Linear and Areal Objective, Connectivity of Linear Objects, Gravity Model, Routing and Allocation, The Missing Variables Comparing Variables Among Maps: The Cartographic Overlay, Point-in-Polygon, Line-in-Polygon, Polygon Overlay, Automating the Overlay, Types of Vector Overlay, CAD-Type Overlay, Dasymetric Mapping Cartographic Modeling: Model Components, The Cartographic Models, Types of Cartographic Models, Inductive and Deductive Modeling, Factor Selection, model Flowcharting, Model implementation, Model Verification	23
4	GIS Output The Output from Analysis: Output: The Display of Analysis, Cartographic Output, Noncartographic Output	5
	Total	48



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Learning Outcomes:

Understand the spatial aspects of an external client's GIS needs and develop a plan for addressing those needs. Design, compile, and develop a spatial database and a set of analytical tools into a system appropriate to the problem. Demonstrate a mastery of geographic analysis and cartographic skills. Communicate the GIS project process and the results in written, oral, and graphic media at a professional level. By completing the course, the student will have a basic, theoretical understanding of GIS, and be able to work independently with various types of geographical data in GIS.

Teaching & Learning Methodology:

Using multimedia in a problem-based learning environment. The institute provides an excellent academic environment with an accent on self-learning. The teaching and learning methodologies follow a rigorous regime that involves intensive and extensive working on challenging academic assignments.

Books Recommended:

1. Fundamentals of Geographic Information Systems, **Michael N DeMers**, Wiley India Education
2. Introduction to Geographic Information Systems, **Kang-tsung Chang**, McGraw-Hill Publication
3. Concepts and Techniques of Geographic Information Systems, **YEUNG, ALBERT K. W., LO, C. P.**, PHI Learning