

<b>Name of Faculty</b>	:	Faculty of Engineering & Technology
<b>Name of Program</b>	:	Master of Technology (M. Tech)
<b>Course Code</b>	:	2MEE06
<b>Course Title</b>	:	GIS and its Application in Environmental Engineering
<b>Type of Course</b>	:	Open Elective (OE)
<b>Year of Introduction</b>	:	2023-24

<b>Prerequisite</b>	:	Basic knowledge of GIS technology and Environmental Engineering
<b>Course Objective</b>	:	Provide comprehensive instruction in the underlying concepts and principles of geographic information system (GIS) technology and its application to the design and analysis of civil and environmental engineering systems.
<b>Course Outcomes</b>	:	At the end of this course, students will be able to:
	CO1	Analyze the basic components of GIS.
	CO2	Classify the maps, coordinate systems and projections.
	CO3	Process spatial and attribute data and prepare thematic maps.

### Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
L	T	P		Theory Marks		Practical Marks		Total Marks
			C	SEE	CIA	SEE	CIA	
3	0	0	3	70	30	0	0	100

*Legends: L-Lecture; T-Tutorial/Teacher Guided Theory Practice; P - Practical, C - Credit, SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

### Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	<b>Essential components of GIS:</b> Geographic grid, map projection, coordinate systems. Vector data and its representation, topological and non-topological vector data, TIN, vector analysis. Acquiring and handling of raster data, GIS data analysis. GIS packages and their salient features, Advantage and disadvantage of GIS application.	25	60%	CO1 CO2
2	<b>Selection of software and hardware:</b> Remote sensing Application. GPS application,	17	40%	CO3

	DEM Application, Mapping, Water and sewer model.			
--	--------------------------------------------------	--	--	--

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	10	15	30	15	15	15

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

#### Suggested Learning Websites

Sr. No.	Name of Website
1	<a href="https://www.nationalgeographic.org/encyclopedia/map-projection/">https://www.nationalgeographic.org/encyclopedia/map-projection/</a>
2	<a href="https://gisgeography.com/gis-analysis/">https://gisgeography.com/gis-analysis/</a>
3	<a href="https://geoawesomeness.com/6-steps-for-a-successful-gis-implementation/">https://geoawesomeness.com/6-steps-for-a-successful-gis-implementation/</a>
4	<a href="https://www.esri.com/en-us/what-is-gis/mapping-and-visualization">https://www.esri.com/en-us/what-is-gis/mapping-and-visualization</a>

#### Reference Books

Sr. No.	Name of Reference Books
1	Concept and Techniques of Geographical Information systems by C.P. Lo, Prentice Hall.
2	Introduction to Geographical Information Systems by Kang-tsung Chang, McGraw-Hill.
3	Geographical Information systems, A Management Perspective by Stan Aromoff, WDL Publications.
4	GIS Applications for water, wastewater, and stormwater systems by U.M. Shamsi, CRC Press.