**University of Management and Technology**

**Course Outline**

Course code: GIS-123

Course title: INTRODUCTION TO GIS

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| --- | --- |
| Program | BS Remote Sensing and GIS |
| Credit Hours | 3 |
| Duration | 15 |
| Prerequisites | None |
| Resource Person |  |
| Counseling Timing  (Room# ) |  |
| Contact |  |

**Chairman/Director signature………………………………….**

**Dean’s signature…………………………… Date………………………………………….**

**Learning Objective:**

The course aims at providing an understanding of GIS, its evolution, applications, spatial data models and data structures, design aspects of GIS; spatial data acquisition, sources and standards; spatial data manipulation, spatial analysis and visualization of data. This course also covers the understanding of GIS software environment. This subject provides basic training in understanding GIS data capture, storage, retrieval, analysis and display. It also helps to learn functionality of GIS software and to gain basic skills.

**Learning Methodology:**

* Lecturing
* Practical Assignments
* Guest Speaker
* Case Studies

**Grade Evaluation Criteria**

Following is the criteria for the distribution of marks to evaluate final grade in a semester.

**Marks Evaluation Marks in percentage**

Quizzes

Assignments

Mid Term 20

Attendance & Class Participation

Term Project

Presentations

Final exam 80

Total 100

**Recommended Text Books:**

1. Heywood, I., Cornelius, S. and Carver, S. (2006), *An introduction to Geographic Information System*, New York, Addison Wesley Longman.
2. Clarke, K. (2004), *Getting Started with Geographic Information System*, New York, Prentice Hall, ISBN – 1879102897.
3. Burrough, P., (2002), *Principles of Geographic Information Systems for Land Resources Management*, Oxford, Oxford University Press, ISBN – 0198233655.

**Reference Books:**

1. Lo, C. P. and Yeung, A. K. W. (2002), *Concepts and Techniques of Geographic Information Systems*. Upper Saddle River, NJ, Prentice Hall.
2. Otto Huisman and Rolf A. de (2000), *Principles of Geographic Information Systems*, The Netherlands ITC, ISSN-978-90-6164-269-5.
3. ESRI, *Getting Started with ArcGIS*, Online Tutorial, USA.

**Calendar of Course contents to be covered during semester**

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| **Week** | **Course Contents** | **Reference Chapter(s)** |
| 1 | * Introduction, Definitions Components, Functional Subsystem, Raster Data Model, Vector Data Model, Attribute Data Model |  |
| 2 | * Data Acquisition Techniques, |  |
| 3 | * Data Interoperability (Transferring Data to and From Different Software like ArcGIS, AutoCAD etc.) |  |
| 4 | * Remote Sensing as Data Source; Introduction to Remote Sensing and Image Processing |  |
| 5 | * Data Transformation, Visualization of Spatial Data in Desired Projections |  |
| 6 | * Cartography and Visualization: Map Elements, Symbols to Portray Points, Lines, Area and Volumes, Variables Visual Hierarchy, Map Scale And Spatial Details |  |
| 7 | * Introduction to Spatial Analysis: Overlay Functions, Neighborhood Functions, Triangular Irregular Network (TIN), Digital Elevation Model (DEM) |  |
| 8 | * Network And Overlay Analysis, Segmentation Analysis |  |
| 9 | * Spatial Data Quality, Data Accuracy and Precision |  |

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| --- | --- | --- |
| 10 | * Introduction to GIS lab (hardware/software) |  |
| 11 | * Practical demonstration of raster/vector/attribute data preparation, entry and display |  |
| 12 | * Data capturing through various means |  |
| 13 | * Digitization, vector/raster conversion, data layer integrations, data visualization, map layouts |  |
| 14 | * Data classification and thematic mapping, handling topological errors |  |
| 15 | * Data Resources, Data Capturing Techniques And Procedures |  |