**University of Management and Technology**

**Course Outline**

Course code: GIS-233

Course title: FUNDAMENTALS OF REMOTE SENSING

|  |  |
| --- | --- |
| 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:**

This course introduces students to find out how pictures of the earth's surface are recorded from aircraft and satellites and different ways these images can be analyzed. Students gain an understanding of "common" Remote Sensing products such as earth resources, satellite images, aerial photographs as well as more sophisticated research tools such as RADAR and multispectral scanner systems. In this course via field trips opportunity is provided to assess the usefulness of different types and scales of remotely sensed data via on the ground comparisons. Basic map reading skills required for Remote Sensing projects are also covered.

**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:**

**Recommended Books**

Lillesand, T. M. and Kiefer, R. W. (2004). Remote Sensing and Image Interpretation, 5th edition. (John Wiley and Sons), ISBN 0-471-15227-7

Mather, P M (2004). Computer Processing of Remotely Sensed Images, 3rd Ed. (John Wiley and Sons), ISBN 0-470-84919-3

Campbell, James B. (2002. Introduction to Remote Sensing, 3rd Ed., (The Guilford Press) ISBN # 0-7484-0663-8 (pbk).

**Reference Books:**

Gibson, P.J (2000). Introductory Remote Sensing: Principles and Concepts (Routledge), ISBN 0-415-19646-9

Jensen, J. (2000) Remote Sensing of the Environment: An Earth Resources Perspective, Amazon Publishers, ISBN #

Sabins, F.F (1996). Remote Sensing: Principles and Interpretation, 3rd ed, (W H Freeman & Co), ISBN # 0-7167-2442-1

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

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|  |  |  |
| --- | --- | --- |
| **Week** | **Course Contents** | **Reference Chapter(s)** |
| 1 | * Definition and History, |  |
| 2 | * Physical Basis (EM Spectrum, Energy Interaction, Spectral Reflectance Curves, Image Characteristics) |  |
| 3 | * Introduction to Aerial Photograph, |  |
| 4 | * Sensor Systems (Space and airborne, MSS, TM, ETM, HRV, LISS, IKONOS-2, Quick bird-2, AVHRR and others), |  |
| 5 | * Platforms (Types and Orbital Characteristics), |  |
| 6 | * Thermal Infrared (Characteristics, TIR Band Properties, TIR Image Interpretation, Intro to Microwave (Importance and applications), |  |
| 7 | * Digital Image Processing (Overview of computer based image processing), |  |
| 8 | * Applications (agriculture, urban, natural resources etc.) |  |
| 9 | * Introduction to labs, |  |

|  |  |  |
| --- | --- | --- |
| 10 | * Single band image interpretation, |  |
| 11 | * False color predictions, |  |
| 12 | * False color composite Images Interpretation, |  |
| 13 | * Visual Interpretation of aerial photographs, |  |
| 14 | * Various sensors data comparison, * Identification of targets, |  |
| 15 | * Thermal Infrared Image interpretation, * Intro to ERDAS Imagine, display, Geo-linking, Zooming, |  |