|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Image result for nit meghalaya logo | | | | **National Institute of Technology Meghalaya**  An Institute of National Importance | | | | | | | | | | | | | | | | | | | | | | | **CURRICULUM** | | | | | |
| Programme | | | | **Bachelor of Technology in Civil Engineering** | | | | | | | | | | | | | Year of Regulation | | | | | | | | | | **2019** | | | | | |
| Department | | | | **Civil Engineering** | | | | | | | | | | | | | Semester | | | | | | | | | | **IV** | | | | | |
| Course  Code | | Course Name | | | | | | | | **Pre requisite** | | | | Credit Structure | | | | | | | | Marks Distribution | | | | | | | | | | |
| L | | T | | | P | C | | INT | | | MID | | | END | | | Total | |
| **CE222** | | **Remote Sensing and GIS** | | | | | | | | **Nil** | | | | **3** | | **0** | | | **0** | **3** | | **50** | | | **50** | | | **100** | | | **200** | |
| Course  Objectives | | To understand use of aerial camera, aerial photographs and procedure of aerial survey | | | | | | | | | | Course Outcomes | | | | CO1 | | | Gain a clear understanding of photogrammetry surveying. | | | | | | | | | | | | | |
| To provide background knowledge and understanding of principle of remote sensing and remote sensing system | | | | | | | | | | CO2 | | | Understand the working principle of remote sensing system. | | | | | | | | | | | | | |
| To gain knowledge about the data interpretation techniques. | | | | | | | | | | CO3 | | | Understanding of various image processing techniques | | | | | | | | | | | | | |
| To provide knowledge about the basic of GPS | | | | | | | | | | CO4 | | | Gain understanding of GPS | | | | | | | | | | | | | |
| To gain knowledge about working principle of GIS | | | | | | | | | | CO5 | | | Gain understanding of GIS | | | | | | | | | | | | | |
| No. | COs | | Mapping with Program Outcomes (POs) | | | | | | | | | | | | | | | | | | | | | | | Mapping with PSOs | | | | | | |
| PO1 | | PO2 | PO3 | PO4 | PO5 | PO6 | | PO7 | | PO8 | | PO9 | | | PO10 | | | PO11 | | PO12 | | | PSO1 | | | PSO2 | | | PSO3 |
| 1 | CO1 | | 2 | | 1 | 1 | - | 1 | - | | - | | - | | - | | | - | | | - | | 1 | | | **3** | | | **1** | | | **0** |
| 2 | CO2 | | - | | - | - | - | 3 | 1 | | - | | - | | 1 | | | - | | | - | | 2 | | | **2** | | | **1** | | | **1** |
| 3 | CO3 | | 1 | | - | - | - | 3 | - | | - | | - | | - | | | - | | | - | | 1 | | | **2** | | | **1** | | | **0** |
| 4 | CO4 | | 1 | | - | - | - | 3 | - | | - | | - | | - | | | - | | | - | | 2 | | | **1** | | | **1** | | | **1** |
| 5 | CO5 | | 1 | | - | - | - | 3 | - | | - | | - | | - | | | - | | | - | | 2 | | | **1** | | | **1** | | | **1** |
| SYLLABUS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. | Content | | | | | | | | | | | | | | | | | | | | | | | Hours | | | | | | COs | | |
| I | **Photogrammetry:** Principles& types of aerial photograph, geometry ofvertical aerial photograph, Scale & Height measurement on single vertical aerial photograph, Height measurement based on relief displacement, Fundamentals of stereoscopy | | | | | | | | | | | | | | | | | | | | | | | **07** | | | | | | **CO1** | | |
| II | **Remote Sensing**: Introduction, Definition and Overview of Remote Sensing and Remote Sensing Systems, Electromagnetic Radiation, Terms and Definitions , electromagnetic Spectrum, Sources of electromagnetic radiation, Principles of energy interaction in atmosphere and earth surface features, Remote sensing advantages & Limitations | | | | | | | | | | | | | | | | | | | | | | | **07** | | | | | | **CO2** | | |
| III | **Image Processing and Interpretation:**Image interpretation techniques, visual interpretation, Digital image processing, Principles of Thermal Remote Sensing & its applications, Principles of Microwave Remote Sensing & its applications | | | | | | | | | | | | | | | | | | | | | | | **07** | | | | | | **CO3** | | |
| IV | **GPS Basics:** System overview, working principle of GPS, Satellite ranging, calculating position, Ranging errors and its correction, Static and Rapid GPS surveyingc, DGPS and Kinematic methods, Real time and post processing DGPS, visibility diagram ,GAGAN. | | | | | | | | | | | | | | | | | | | | | | | **07** | | | | | | **CO4** | | |
| V | **Geographical Information System:**Definition of GIS, Key Components of GIS, Functions of GIS, Spatialdata,spatial information system Geospatial analysis, Integration of Remote sensing and GIS,and Applications in Civil Engineering | | | | | | | | | | | | | | | | | | | | | | | **08** | | | | | | **CO5** | | |
| Total Hours | | | | | | | | | | | | | | | | | | | | | | | | **36** | | | | | |  | | |
| **Essential Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Basics of Remote sensing & GIS by S. Kumar, Laxmi Publications. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Concepts & Techniques of GIS by C. P. Lo Albert, K.W. Yonng, Prentice Hall (India) Publications. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Principals of Geo physical Information Systems – Peter ABurragh and Rachael A. Mc Donnell, Oxford Publishers 2004. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Surveying Vol. II and III by Dr. B.C. Punamia, Laxmi Publishers. New Delhi | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Supplementary Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Remote Sensing and GIS Lillesand and Kiefer, John Willey 2008. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Remote Sensing and GIS B. Bhatta by Oxford Publishers 2015 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Introduction to Geographic Information System – Kang-Tsung Chang, McGraw-Hill 2015 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |