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| 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** |
| CourseCode | Course Name | **Pre requisite** | Credit Structure | Marks Distribution |
| L | T | P | C | INT | MID | END | Total |
| **CE214** | **Advance Surveying Techniques** | **Nil** | **3** | **0** | **0** | **3** | **50** | **50** | **100** | **200** |
| CourseObjectives | Understand methods involved to conduct tacheometry and geodetic survey | Course Outcomes | CO1 | Apply advanced surveying techniques in different fields of civil engineering |
| To Apply principles of theory of errors for correction of measurements. | CO2 | Select the advanced surveying technique which is best suited for a work |
| To understand use of aerial camera, aerial photographs and procedure of aerial survey | CO3 | Understand the variety of error involved in measurement and how to resolve the errors. |
| To understand Map projection. | CO4 | Understand the principles of the earth surface, its projections and different coordinates involved in map making. |
| To gain knowledge about various modern surveying tools. | CO5 | Gain knowledge about the various modern surveying tools |
| 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 | 3 | 3 | 1 | 2 | 3 | - | - | - | - | - | - | 2 | **3** | **2** | **1** |
| 2 | CO2 | 3 | 3 | 1 | - | 3 | 1 | - | - | 1 | - | - | 1 | **3** | **3** | **1** |
| 3 | CO3 | 3 | 3 | - | 2 | - | - | - | - | - | - | - | 1 | **2** | **2** | **0** |
| 4 | CO4 | 1 | 2 | - | - | 1 | - | - | - | - | - | - | 2 | **1** | **1** | **0** |
| 5 | CO5 | - | - | - | - | 3 | - | - | - | - | - | - | 1 | **2** | **1** | **1** |
| SYLLABUS |
| No. | Content | Hours | COs |
| I | **Tacheometric Surveying** : Introduction, purpose, principle, instruments, stadia constants, methods of tacheometry, field work in tacheometry. | **07** | **CO1,CO2** |
| II | **Geodetic Surveying:** Principle and Classification of triangulation system, Selection of base line and stations- Orders of triangulation- Triangulation figures- Station marks and signals- marking signals- Extension of base, Reduction of Centre, Selection and marking of stations | **07** | **CO1,CO2** |
| III | **Theory of Errors** : Introduction, types of errors, definitions, laws of accidental errors, laws of weights, theory of least squares, rules for giving weights and distribution of errors to the field observations, determination of the most probable values of quantities. | **07** | **CO3** |
| IV | **Geodesy** Figure of earth, Classification , Earth surface, Geodetic reference surfaces, Coordinate systems, Geodetic datum and elements, Scale of map, projection, Map projection of India, Space Geodesy | **07** | **CO4** |
| V | **Modern Surveying Instruments**: Introduction, Electromagnetic spectrum, Electromagnetic distance measurement, Total station, Digital self-levelling levels, scanners for topographical survey. | **08** | **CO2, CO5** |
| Total Hours | **36** |  |
| **Essential Readings** |
| 1. Surveying Vol. I, II and III by Dr. B.C. Punamia, Laxmi Publishers. New Delhi
 |
| 1. Surveying Vol. I and II by S. K. Duggal, Tata Mcgraw Hill, New Delhi
 |
| 1. Advanced Surveying by R. Agor, Khanna Publishers, New Delhi
 |
| 1. Surveying theory and practice 7th Edition by James M Anderson and Adward M Mikhail Tata McGraw Hill Publication.
 |
| **Supplementary Readings** |
| 1. Schofield G. W., Butterworth, Heinemann, “Engineering Surveying”, New Delhi.
 |
| 1. Joseph G., “Fundamentals of Remote Sensing”, Universities Press
 |
| 1. Kanetkar T. P. and Kulkarni S. V., “Surveying and Levelling, Vol-I and Vol-II”, Pune VidyarthiGrihaPrakshan.
 |
| 1. Chandra A.M. ”Higher Surveying”, New Age International.
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