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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** | Year of Regulation | **2019-20** |
| Department | **Civil Engineering** | Semester | **III** |
| CourseCode | Course Name | **Pre requisite** | Credit Structure | Marks Distribution |
| L | T | P | C | INT | MID | END | Total |
| **CE 203** | **Surveying** | **Nil** | **3** | **1** | **0** | **4** | **50** | **50** | **100** | **200** |
| CourseObjectives | To develop the student’s knowledge to understand the basic skills of surveying work including distance and angle measurement | Course Outcomes | CO1 | Able to understood the basic skills of surveying and levelling work |
| To provide knowledge on types of survey methodology and equipment suitable for a particular engineering projects. | CO2 | Able to finalise and select a particular type of survey and equipment suitable for a particular engineering. |
| To introduce different type of surveying equipment  | CO3 | Able to use different type of surveying equipment like Compass, Theodolite, levels etc., for direction measurement, angle measurement, differential levelling and contouring |
| To provide knowledge on how to prepare a surveying map using collected surveying data. | CO4 | Able to prepare a surveying map using collected surveying data from total station |
| To get introduced to modern advanced surveying techniques involved such as remote sensing, Total station, GPS etc.  | CO5 | Abe to understand the basic concept of remote sensing & GIS |
|  | CO6 |  |
| 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** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** | **3** | **0** |
| 2 | CO2 | **3** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** | **3** | **0** |
| 3 | CO3 | **3** | **3** | **0** | **0** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** | **3** | **0** |
| 4 | CO4 | **3** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** | **3** | **0** |
| 5 | CO5 | **3** | **3** | **0** | **0** | **3** | **0** | **3** | **0** | **0** | **0** | **0** | **0** | **3** | **3** | **0** |
| 6 | CO6 | **3** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| SYLLABUS |
| No. | Content | Hours | COs |
| I | **Basics of surveying** Introduction to surveying-concept of plane and geodetic surveys, principles of surveying, errors in measurements, surveying instruments, types of maps, scale and uses, plotting accuracy coordinate systems. | 04 | CO1 |
| II | **Linear measurements** Direct and indirect methods, chain and tape measurements-corrections. | 03 | CO1, CO2 |
| III | **Measurement of directions** Bearings and angles, compass surveying-magnetic bearings, declination, local attraction errors and adjustments; Theodolite- different types, uses, methods of observation and booking of data. | 05 | CO2, CO3 |
| IV | **Plane table surveying** Equipment’s, principles, operation, methods, errors, advantages and disadvantages. | 06 | CO1, CO2 |
| V | **Levelling and contours** Methods of height determination, profile levelling and cross sectioning, contours - their characteristics, uses and methods of contouring. | 06 | CO1, CO2, CO3  |
| VI | **Curve survey** Setting out of simple circular, compound, reverse, transition and vertical curves | 04 | CO3, CO4 |
| VII | **Traversing and Triangulation Surveying** Compass and theodolite traverses; Triangulation systems, intervisibility, Signals, satellite stations, computations and adjustments. | 05 | CO3, CO4 |
| VIII | **Photogrammetry** Aerial Photographs, basic terms & definitions, scales, relief displacements, flight planning, stereoscopy, characteristics of photographic images, fundamentals of aerial photo-interpretation. | 06 | CO1, CO3 |
| IX | **Modern surveying equipment** Introduction to total station. | 03 | CO4 |
| X | **Global positioning system (GPS)** Introduction, GPS principles, satellite navigation system, GPS, space segment, control segment, user segment, and GPS satellite signals, receivers, static, kinematic and differential GPS. | 03 | CO5 |
| XI | **Remote sensing:** Principles, EME, sensors and platforms of remote sensing, its application and scope. | 03 | CO5 |
| Total Hours | **48** |  |
| **Essential Readings** |
| 1. B.C. Punmia, “Surveying Vol.I and II, Standard Publishers”, Second edition, 1994.
 |
| 1. S.K. Duggal, “Surveying Vol. I and II, Tata McGraw Hill”, Fourth edition, 2004.
 |
| 1. W. Schofield and M. Breach, “Engineering Surveying”, 6th edition, CRC Press, 2007.
 |
| **Supplementary Readings** |
| 1. N.N. Basak , “Surveying & Levelling, McGraw Hill, second edition, 2014
 |
| 1. K.R. Arora, “Surveying Vol. I and II” Standard Book House, 1996
 |
| 1. G. Satheesh, “The Global Positioning System and Surveying using GPS”, Tata McGraw, 2005.
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