BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
Instruction Division
First Semester 2018-2019
Course Handout (Part II)

Date: 02/08/2018

In addition to Part I (General Handout for all courses appended to the Time Table), this portion gives further specific details regarding the course.

Course No. : **CE F213**
Course Title : **SURVEYING**
Instructor In-Charge : **G MUTHUKUMAR**
Instructor : **Agnivesh P, Makrand Waghle, Harish Puppala, Harish Kumar Mulchandani**

Course Description:
The compulsory disciplinary course has been designed to introduce the basic concepts of geodesy (surveying) for Civil Engineering students. Different basic and advanced methods of measurements and traversing have been included so that the student will be able to handle a given project independently, irrespective of whether it is a road or any other infrastructure project. Important issues like curve setting, calculation of areas and volumes, which form part and parcel of any filed civil engineer in his/her day to day activity. Hence in this course, these areas have also been included.

Scope & Objective:
The course introduces to the students, various basic techniques in surveying, viz. chain, compass, theodolite, plane table, tacheometry, traversing and calculation of areas and volumes along with fundamentals of a few advanced surveying techniques.

Text Books:
T1. Duggal S.K.; Surveying; Tata McGraw-Hill, New Delhi, Vol I and II, 4th Edition (2013)
T2. Moondra, H.S. and Gupta Rajiv, Lab Manual for Civil Engineering, CBS, 2nd edition, (2000)

Reference Books:
R1. Punmia B.C; Surveying; Laxmi Publishers, Vol I, II and III, (1990)
R2. Agor, R; A Text Book of Surveying & Levelling, Khanna Publishers. New Delhi.
R3. N N Basak: Surveying & Levelling, McGraw Hill Education (India) Private Limited, New Delhi, 2nd edition, 2014.
R4. Venkatramaiah, C; Textbook of Surveying, University Press, Second Edition, 2011
R5. Bhavikatti, S.S; Surveying Theory & Practice, Ik International Publishing House Pvt Ltd, New Delhi, 2011

Module objectives:
- To familiarize the basic fundamentals of surveying and linear measurements [**Module 1**]
- To compute and correct the measured bearings to determine area of field for different types of traverse [**Module 2**]

- To determine the reduced levels and also to establish various contours [**Module 3**]
- To plot the area of field using plane table surveying using the surveying principles and also the use of principle of tacheometry [**Module 4**]
- To set the simple circular curves for various geometric parameters [**Module 5**]
- To evaluate the errors and corrective measures due to the curvature, refraction and collimation [**Module 6**]
- To determine the areas and volumes for different road cross section and from contour maps [**Module 7**]
- To acknowledge the recent advancements and field innovations in land surveying [**Module 8**]

Course Plan:

Module	Lecture No.	Topic	Topics to be covered	Text Book
Module 1	1	Introduction to the basic concepts of Geodesy	Fundamental definitions and concepts	Chapter 1/ T1 Vol I
	2-3	Linear Measurements and instruments	Methods, accessories, ranging	Chapter 2/ T1 Vol I
	4-6	Chain Survey	Steps in chain survey, field work and plotting in field book, obstacles in chaining.	Chapter 2/T1 Vol I
Module 2	7-9	Compass Survey	Instrument, principles, Bearings	Chapter 3/TI Vol I
	20-22	Traversing	Methods, adjustments and plotting	Chapter 5/ T1 Vol I
Module 3	10-11	Levelling	Instrument, Collimation method, Rise and fall method, curvature and refraction. Level book	Chapter 6/ T1 Vol I
	12-13	Contouring	Objectives, use, methods.	Chapter 9/ T1 Vol I
Module 4	14-16	Plane Table Survey	Accessories, methods, errors	Chapter 8/T1 Vol I
	17-19	Tacheometric Surveying	Theory, instrument constants, methods	Chapter 7/ T1 Vol I
Module 5	23-27	Curve Ranging	Types, properties, circular and transition curves.	Chapter 11/T1 Vol I
Module 6	28-30	Trigonometrical Levelling	Geodetic survey, visibility between two places.	Chapter 1/ T1 Vol II
Module 7	31-33	Computation of Areas	Different methods, approximate method, planimeter	Chapter 12/ T1Vol I
	34-37	Computation of Volumes	Level section, multilevel section,	Chapter 13/ T1 Vol I

			volume from contour plan, mass-haul diagram	
Module 8	38-40	Advanced Topics	Total Stations and other advancements in surveying, Errors & adjustments, Photogrammetry and remote sensing	Chapter 10/ T1Vol-I and Chapter 3, 5, 6,7,8,9/T1 Vol II
	41-42	Practical aspects of field work	Common mistakes in field, Setting out Works	Chapter 14/T1 Vol I

Practicals:

No.	Name of experiment	No. of turns	Cycle
1	Ht. of tall objects by two-plane method	1	One
2	Profile levelling	1	
3	Obstructions in Chain Surveying	1	
4	Contour survey by square grids	1	
5	Simple circular curve by chain and tape	1	Two
6	Simple circular curve by theodolite	1	
7	Transition curve by theodolite	1	
8	Chain and Compass traversing	1	
9	Demonstration of Total station		Three
10	Practice session on Plane table surveying		

Evaluation Scheme:

S.No.	Evaluation Component	Duration	Weightage	Date & Time	Nature of Component
1	Mid Test	90 min	35	10/10 2:00 - 3:30 PM	Closed Book
2	Tutorials (Best 5 out of 7)	50 min	10 (=5 x 2)		Open Book
3	Compre. Exam	3 hours	40	5/12 FN	Closed Book
4	Lab Component	2 hours every week	10		Open Book
5	Lab Quiz	50 min	5		Closed Book

Chamber Consultation Hour: Thursday 5 pm to 6 pm
Mid Sem Grading: [Mid Sem + 4 Tutorials = 35+8= 43%]

Notices: Communications will be sent only through e-mail.

Make-up Policy:

1. Make-up will be granted only on genuine reasons, upon request.
2. For medical cases, a certificate from the concerned physician of the Medical Centre must be produced.

Special Instructions for Survey Field Work:

1. Students must collect the instruments in the specified time. Late arrival will not be entertained.

2. The students must come to the field- work with a field observation book or any other specified field book, pencil, scale and a calculator. Since the work may involve standing in the sun for longer duration of time, you are advised to wear caps during field surveys

Instructor-in-charge
CE F213