Advanced Engineering Survey

Course Code	Credit Hours
CE-216	1-2

Course Description

This course is the follow up of Surveying-I in which students were taught basic surveying skills by doing most of the data acquisition with manual measurements. However, in this course all the practical work is done by using the modern hardware and software. Field data is acquired and stored in the Total Stations and GNSS Receivers. It is downloaded in the computers in the lab and further processed by using computer software (Micro Survey CAD) The output, which is in the shape of maps, is plotted on colour plotters for field users.

Students are also taught the basic concepts of advanced topics like Geodesy, Map Projections and Grid Systems. This enables them to understand our National Mapping/Grid System. Introductory lectures on Photogrammetry educate them on the possibilities of using this technology for planning mega projects.

Text Book:

1. Surveying Theorey and Practice, R.E. Davis, 6/7 Edition

2. Wolf P.R. & Ghilani C.D, (2004), Elementary surveying – An Introduction to Geomatics, 11th Edition, Prentice Hall USA.

3. Thomas, M. Lillesand & Ralph W. Kiefer, (2005), Remote Sensing and Images Interpretation, 5th Edition, John Wiley and Sons, Inc

4. Survey & Levelling by T.P.Kanetkar and S.V.Kulkarni (Vol -I & Vol -II)

5. Surveying Principles and Applications by Barry Kavanagh

Reference Book:

1. Survey for Engineers by John Uren & Bill Price

Prerequisites :

Engineering Surveying**.**

ASSESSMENT SYSTEM FOR THEORY

	Without Project (%)	With Project/Complex Engineering Problems (%)
Quizzes	15	10-15
Assignments	10	5-10

Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

ASSESSMENT SYSTEM FOR LAB

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%
Final Assessment/ Viva	20%

Teaching Plan

Week No	Topics/Learning Outcomes
1	Basic Geodesy
2	Trigonometric Levelling
3-4	Tachometric Survey
5	GNSS, Introduction and use for survey projects.
6	Field data acquisition with a total station for topographic mapping and highway alignments.
7	Introduction to Mapping software (Micro Survey CAD / CIVIL 3D) and its use for different survey applications.
8	Control Surveys. Map Projections. Universal Transverse Mercator, Lambert Conical Conformal Projections and Grid system of Pakistan
9	MSE
10	Introduction to Photogrammetry and Air Survey. Application of Photogrammetry, Stereoscopy
11-12	Highway and Railway Curves. Route Surveys for Longitudinal Projects, Classification of curves (Horizontal, Vertical), Circular, Compound, Reverse, Spiral Curves and Superelevation, Setting out of circular curves by deflection and cord calculations,
13	Hydrographic Surveys. Objectives of hydrographic survey, Controls and

	sounding
14	Field Astronomy. Solar and Stellar observations for position and Azimuth
15	Tunnel Surveying. Surface Alignment, Setting Out from ends, Transferring Alignment Underground, Use of Gyroscope
16	Setting out of works.
17-18	**End Semester Exam**

Practical

Experiment No	Description
1	Trigonometric Levelling.
2	Tachometry.
3	Use of GNSS in Differential mode and in RTK mode for survey projects.
4	Field data acquisition with a total station for topographic mapping and highway alignments.
5	Processing topographic mapping data on Mapping Software (Micro Survey CAD / CIVIL 3D)
6	Use to Stereoscope
7	Setting out of simple, Transition and Compound Curves
8	Setting out of works.