Liverpool John Moores University

Title:	CIVIL ENGINEERING SURVEYING 2
Status:	Definitive
Code:	**5026BEUG** (102772)
Version Start Date:	01-08-2011
Owning School/Faculty:	Built Environment
Teaching School/Faculty:	Built Environment

Team	Leader
John McLoughlin	Y
Chris Byrne	

Academic Level:	FHEQ5	**Credit Value:**	12.00	**Total Delivered Hours:**	83.00
Total Learning Hours:	120	**Private Study:**	37		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24.000
Off Site	32.000
Practical	12.000
Tutorial	12.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Unseen	70.0	3.00
Report	AS2	Report, computations and drawings from fieldwork.	30.0	

Aims

To introduce methods of obtaining orientation and position by intersection and resection.
To introduce geodetic and satellite surveying and the principles of the theory of errors.

To demonstrate how total stations and GNSS receivers, can capture data for use in software packages to produce contoured plans, sections, areas and volumes.

Learning Outcomes

After completing the module the student should be able to:

1 Obtain position and orientation of and from remote points and set out and control on site complex highway curves and underground works.
2 Work and communicate effectively and safely in a survey team when participating in complex procedures or working at large distances.
3 Account for the global nature of modern surveying and the differences between global and national reference systems.
4 Apply statistical theory to the adjustment of survey measurements and the assessment and control of precision.
5 Use a standard computer software package to process total station and satellite surveying observations and produce appropriate drawings.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

EXAM	1	3	4		
REPORT	1	2	3	4	5

Outline Syllabus

Orientation and Position: Resection and intersection techniques.
Setting out: Field positioning of: - spiral transition curves and parabolic vertical curves on highways; the underground transfer of bearings for tunnels and pipelines.
Geodetic surveys: Errors and adjustments for curvature of the earth and refraction of light rays, and the use of reciprocal readings in levelling. The measurement of long lines.
Error theory: Statistical theory applied to the measurement of level, angle and distance and the propagation of errors.
Total stations: Demonstrations of the field measurements and coding systems available with total stations and GNSS receivers and their use with a computer software package.

Learning Activities

Lectures, tutorials, computational problems, practical use of surveying instruments in the field, survey software packages.

References

Course Material	Book
Author	Bannister A, Raymond S, Baker R
Publishing Year	1998
Title	Surveying
Subtitle	
Edition	7th ed
Publisher	Longman Scientific and Technical
ISBN	0582236444

Course Material	Book
Author	Muskett J
Publishing Year	1995
Title	Site Surveying
Subtitle	
Edition	2nd ed
Publisher	Blackwell Science
ISBN	0632038489

Course Material	Book
Author	Schofield W
Publishing Year	2001
Title	Engineering Surveying
Subtitle	
Edition	5th ed
Publisher	Butterworth Heinemann
ISBN	0750649879

Course Material	Book
Author	Kaplan ED, Hegarty CJ
Publishing Year	2006
Title	Understanding GPS
Subtitle	principles and applications
Edition	2nd ed
Publisher	Artech House
ISBN	1580538940

Notes

The field measurements required to set out complex designed features to full scale on site in both line and level. Methods of obtaining orientation and position from remote points and by satellite-based methods, statistical adjustments of measurements, allowing for errors due to the curvature of the earth and the use of electronic methods to obtain computerised contoured plans.