

Liverpool John Moores University

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Title: SURVEYING
Status: Definitive
Code: **5124BEUG** (117989)
Version Start Date: 01-08-2016

Owning School/Faculty: Civil Engineering
Teaching School/Faculty: Civil Engineering

Team	Leader
John McLoughlin	Y
Jayne Dooley	
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Academic Level: FHEQ5 **Credit Value:** 24 **Total Delivered Hours:** 131

Total Learning Hours: 240 **Private Study:** 109

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	36
Off Site	32
Practical	36
Tutorial	24

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Exam	60	3
Practice	AS2	Practical Assignment	10	
Report	AS3	Report	30	

Aims

To introduce basic techniques for land surveying and setting out: methods of obtaining orientation, the subsequent field measurements for the purpose of producing site drawings and hence the calculation of land areas and earthwork volumes, setting out points using line-of-sight and satellite techniques.

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 Use a range of levels, tapes and total stations to determine distances, heights, angles and coordinates.
- 2 Use gathered data to produce contour plans, longitudinal and cross sections, and to determine areas of land and volumes of earthworks.
- 3 Obtain position and orientation data of and from remote points and to control and set out construction works.
- 4 Undertake calculations to establish control on site.
- 5 Undertake calculations to set out works on site.
- 6 Use standard computer software packages to post-process survey data and deliver appropriate spatially referenced information.
- 7 Explain the operation and use of GNSS in geomatic surveys.

Learning Outcomes of Assessments

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

EXAM	2	4	5	7
PRACTICAL ASSIGNMENT	1			
REPORT	3	6		

Outline Syllabus

Orientation: The National Grid system of the Ordnance Survey and other coordinate systems. Standard maps and plans, scales and symbols.

Safety and Risk Assessment in surveying operations.

Vertical Control: Set up, use and adjustment of levelling instruments. Ordnance Bench Marks and heighting techniques. Accuracy checks.

Horizontal Control: Set up, use and adjustment of the Total Station.

Total Station traverses and their adjustment.

Setting out: Field positioning of points and lines using the Total Station.

Applications: Computation and drawing of contours, longitudinal sections and cross sections. Determination of areas of land and volumes of earthworks.

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 surveying: the background, operation and use of Global Navigational Satellite Systems.

Surveying Software: Post-processing of total station and GNSS controller data using computer software packages.

Learning Activities

Lectures, computational problems, practical use of surveying instruments in the field, treatment of field data.

Notes

This module teaches land surveying techniques, as required for a Civil Engineer working either on site or in a design context.