

## Liverpool John Moores University

Title: SURVEYING, HIGHWAYS AND TRANSPORTATION  
Status: Definitive  
Code: **5201CIV** (122923)  
Version Start Date: 01-08-2021

Owning School/Faculty: Civil Engineering and Built Environment  
Teaching School/Faculty: Civil Engineering and Built Environment

Team	Leader
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**Academic Level:** FHEQ5      **Credit Value:** 20      **Total Delivered Hours:** 92  
**Total Learning Hours:** 200      **Private Study:** 108

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	20
Off Site	30
Practical	20
Tutorial	10
Workshop	10

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Technology	AS1	SURVEYING FIELD COURSE	40	
Exam	AS2	EXAMINATION	60	2

### Aims

*To introduce methods of infrastructure route planning.*

*To introduce highway geometry, design & construction.*  
*To introduce geodetic and satellite surveying.*  
*To demonstrate how total stations and GNSS receivers, can capture data for use in software packages to produce contoured plans and sections.*  
*To develop practical surveying skills*

## **Learning Outcomes**

After completing the module the student should be able to:

- 1 Explain methods used and data requirements for infrastructure planning
- 2 Apply mathematical methods and design standards proficiently to the effective use of surveying information and the design of highways.
- 3 Obtain position and orientation of and from remote points and set out and control on site infrastructure works.
- 4 Use a standard computer software package to process total station and satellite surveying observations and produce appropriate drawings
- 5 Use a range of land surveying equipment effectively for setting out engineering works

## **Learning Outcomes of Assessments**

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

SURVEYING FIELD	2	3	4	5
COURSE				
EXAMINATION	1	2		

## **Outline Syllabus**

*Evaluation of infrastructure route choices.*  
*Basic highway alignment design.*  
*Orientation: The use of the Reference Object (RO) and orientation to 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 and construction operations.*  
*Horizontal Control: Set up, use and adjustment of the theodolite and Total Station.*  
*Introduction to Global Navigational Satellite Systems.*  
*Setting out of highways works: Field positioning of points and lines using the Total Station.*  
*Applications: Production of site drawings.*  
*Orientation and Position: Resection and intersection techniques.*  
*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, computational problems, practical use of surveying instruments in the field, treatment of field data and subsequent production of site drawings in IT workshops.

### **Notes**

Students will develop their understanding of, and competence in using, land surveying techniques. They will extend their understanding to be able to apply these techniques to highway design.