

MODULE SPECIFICATION PROFORMA

Module Title:	Highway Design	Level:	5	Credit Value:	20
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Module code:	AUR526	New <input checked="" type="checkbox"/>	Code of module being replaced:	
		Existing <input type="checkbox"/>		

Cost Centre:	GABE	<u>JACS3 code:</u>	H230
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Trimester(s) in which to be offered:	1, 2	With effect from:	September 16
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School:	Applied Science, Computing & Engineering	Module Leader:	Louise Duff
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Scheduled learning and teaching hours	Click here to enter hours. 48 hrs
Guided independent study	152 hrs
Placement	0 hrs
Module duration (total hours)	200 hrs

Programme(s) in which to be offered	Core	Option
BSc Civil Engineering Studies	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Office use only

Initial approval August 16

APSC approval of modification *Enter date of approval*

Have any derogations received SQC approval?

Version 1

N/A

Module Aims

This module aims to provide an opportunity to consider and apply the principles required to justify highway projects and develop the skills needed to produce design solutions for highway schemes, whilst considering social, economic and environmental constraints.

Intended Learning Outcomes

Key skills for employability

- KS1 Written, oral and media communication skills
- KS2 Leadership, team working and networking skills
- KS3 Opportunity, creativity and problem solving skills
- KS4 Information technology skills and digital literacy
- KS5 Information management skills
- KS6 Research skills
- KS7 Intercultural and sustainability skills
- KS8 Career management skills
- KS9 Learning to learn (managing personal and professional development, self-management)
- KS10 Numeracy

At the end of this module, students will be able to

Key Skills

At the end of this module, students will be able to		Key Skills	
1	Select and analyse appropriate data to define a problem, identify constraints and justify preliminary options for highway projects.	KS1	KS3
		KS4	KS10
2	Prepare project briefs based on key functions and performance, technical appraisal and analysis of data	KS1	KS2
		KS4	KS10
3	Utilise basic project scope information to apply an integrated approach to engineering problems through know how of the relevant technologies and their application ensuring consideration of the design brief, cost, safety, programme, sustainability and environmental impact.	KS1	KS3
		KS7	KS10
4	Recommend appropriate action in terms of key stages and apply results of engineering analysis to develop detailed design for preferred highway solution.	KS1	KS2
		KS3	KS4
		KS10	

Transferable/key skills and other attributes

Analytical competence
Problem solving
Report Writing
Presentation skills

Derogations

None

Assessment: Please give details of indicative assessment tasks below.

Assessment 1 will comprise of a report to consider options and a brief for a proposed highway scheme.

Assessment 2 will comprise of the provision of initial design details for a highway project, together with a final detailed design for a preferred scheme.

Both assessments may include justification calculations and indicative scheme drawings.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)	Duration (if exam)	Word count (or equivalent if appropriate)
1	1,2	Report	40%		1500
2	3,4	Project	60%		2500

Learning and Teaching Strategies:

Lectures will be delivered to provide the underlying knowledge of the subject and workshops will be provided to introduce software packages such as Revit, MX and Micro-drainage, etc. Students will be introduced to current highway standards such as Design Manual for Roads and Bridges and will consider the application of Building/ Digital Information Modelling. The delivery of this module will be enhanced by site visits to highway capital and maintenance schemes and the use of guest lecturers.

Syllabus outline:

Highway function.

Selection and use of appropriate data sources such as journey characteristics, traffic characteristics and accident studies.

Traffic Forecasting and use of National road traffic forecasts (NRTF).

Preparation and assessment of schemes options and preparation of brief.

Environmental Impact Assessment to include details on air quality, cultural heritage, ecology and nature conservation, land use, water environment, vehicle travellers, geology, etc., etc.

Application of design standards to include consideration of Road Geometry, Geotechnics and Drainage and Pavement Design, etc., as detailed in Design Manual for Roads and Bridges and application of local standards and guidance such as Manual for Streets and Rural Design guidelines.

Basic principles and practice of bridge construction.

Scheme Appraisal and Cost Benefit Analysis (COBA).

Safety Audits.

Health and Safety and Project specific Risk Assessment.

Integration into Building/Digital Information Modelling.

Bibliography:

Essential reading

Rogers, M., Enright, B., (2016), *Highway Engineering*, 3rd Ed, Chichester, Wiley & Sons.

Walsh, I., (2011), *Manual of Highway Design and Management*, London, ICE Publishing.

Design Manual for Roads and Bridges HMSO.

Manual for Streets (2007), HMSO.

Other indicative reading

www.standardsforhighways.co.uk/

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/341513/pdfmanforstreets.pdf

www.ice.org.uk

www.istructe.org.uk

www.theihe.org.uk

www.ciht.org.uk

www.ihsti.com

Other indicative reading will be made available via the VLE.