

Module specification

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Refer to the module guidance notes for completion of each section of the specification.

Module code	AUR542
Module title	Highway Design
Level	5
Credit value	20
Faculty	FAST
Module Leader	Louise Duff
HECoS Code	100148
Cost Code	GABE

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
BSc Civil Engineering Studies	Core

Pre-requisites

N/A

Breakdown of module hours

Learning and teaching hours	30 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	30 hrs
Placement / work based learning	0 hrs
Guided independent study	170 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	13/4/21
With effect from date	01/09/21
Date and details of revision	
Version number	1

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.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Select and analyse appropriate data to define a problem, identify constraints and justify preliminary options for highway projects.
2	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.
3	Recommend appropriate action in terms of key stages and apply results of engineering analysis to develop detailed design for preferred highway solution.

Assessment

Indicative Assessment Tasks:

Assessment 1 will comprise of the provision of a portfolio of evidence/report to provide preliminary design route options, route selection and detailed highway design for preferred route. (4,000 words)

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1-3	Portfolio	100%

Derogations

N/A

Learning and Teaching Strategies

Lectures will be delivered on line to provide the underlying knowledge of the subject. Students will be introduced to current highway standards such as Design Manual for Roads and Bridges and Manual for Streets and group discussion will take place on sustainable design including local Active Travel policies. The delivery of this module will be enhanced by site visits to highway capital and maintenance schemes and the use of guest lecturers.

Indicative 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.

Preliminary Route Selection

WELTAG guidance

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.

Scheme Appraisal and Cost Benefit Analysis (COBA). Safety Audits.

Health and Safety and Project specific Risk Assessment.

Indicative Bibliography:

Essential Reads

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

Design Manual for Roads and Bridges HMSO.

Manual for Streets (2007), HMSO.

Other indicative reading

Design Manual for Roads and Bridges HMSO.

Manual for Streets (2007), HMSO.

Websites:

[Standards for Highways](#)

[Department for Transport - Manual for Streets](#)

[Institution of Civil Engineers](#)

[Institution of Structural Engineers](#)

[Institute of Highway Engineers](#)

[CIHT](#)

[IHSTI](#)

Other indicative reading will be made available via the VLE.

Employability skills – the Glyndwr Graduate

Each module and programme is designed to cover core Glyndwr Graduate Attributes with the aim that each Graduate will leave Glyndwr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas.

Core Attributes

Engaged
Enterprising
Creative
Ethical

Key Attitudes

Commitment
Adaptability

Practical Skillsets

Digital Fluency
Organisation
Critical Thinking
Communication