

Module Specification

Module Summary Information

1	Module Title	Vehicle Electronics and Control
2	Module Credits	20
3	Module Level	6
4	Module Code	ENG6076

5	Module Overview
<p>The module presents the analysis, modelling and design of modern vehicle instrumentation and control systems. Industry-standard software will be used for the design and calibration of engine, vehicle, driveline and emissions after-treatment control systems using both time and frequency domain techniques.</p> <p>Teaching and assessment will comprise not only use of industry standard software for the purposes of mathematical modelling, but also traditional lectures/tutorials assessed by examination.</p>	

6	Indicative Content
<p>Vehicle Electronics Block Diagrams and Feedback DC Motors, Bridge and Op-Amp Circuits, Static and Transient Specifications of 1st and 2nd Order Systems, DC-DC Converters, Power Electronics and CAN,</p> <p>Vehicle Control Steady State and PID Control, Power Steering Control, Engine Idle Speed Modelling and Control, Lambda Control, Driveline Control, Routh Stability, Frequency Response, Gain Criterion</p>	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
1	Apply calibration methodology to vehicle electronic instrumentation to appropriate specifications.
2	Develop models for engine, vehicle, driveline and emissions after-treatment control systems.
3	Determine stability of vehicle control systems using frequency and time response techniques.
4	Design regulators using proportional and integral controllers for vehicle speed and emissions.

8 Module Assessment			
Learning Outcome			
	Coursework	Exam	In-Person
1-4		100%	

9 Breakdown Learning and Teaching Activities	
Learning Activities	Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	0
Private Study (PS) includes preparation for exams	152
Total Study Hours:	200