



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

MODULE DIRECTORY

LEVEL 5

ENGINEERING

WALES INSTITUTE OF SCIENCE & ART

2021-2022

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INTRODUCTION

This Module Directory includes all the modules for Level 5 within Engineering in the academic year 2021-2022.

This directory accompanies the Programme of Study Handbook, which will provide you with details of which modules you will be studying for your programme this year in the 'Programme of Study' section. This directory may include modules that are running on other programmes of study within your Academic Discipline/Institute. If you require assistance in identifying the modules for your programme of study, please contact the Programme Manager (whose name and contact details are provided in the accompanying Programme of Study Handbook), or the relevant Institute Office.

The University has made every effort to make the information as full and as accurate as possible, but you should note that minor changes in the organisation of modules between the planning stage and the actual teaching are inevitable. We shall try to keep any such changes to a minimum, and you will receive plenty of advance warning in the event of any alteration. We would also be grateful if you would let us know about any changes that you think might be helpful if introduced into future handbooks.

MODULES

Module Code	ACHA5004
Title	Motorcycle Dynamics
Date	17/09/2020
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To introduce the student to the technical aspects of motorcycle technology and the basics of motorcycle dynamics and engine performance

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Demonstrate knowledge and understanding of the processes governing the dynamic behaviour of a motorcycle while in motion including power transmission and braking systems and their influence on vehicle behaviour
- Display subject specific skills in the use of modern data acquisition systems and cognitive skills in the development of basic vehicle simulation models

INDICATIVE CONTENT

- Motorcycle Dynamics
 - Determination the wheel loads of a motorcycle under static and dynamic conditions
 - Tyre performance and control
 - Load transfer under longitudinal acceleration
 - Steady state vehicle balance
- Aerodynamics
 - Principles
 - Aerodynamic devices
 - Influence on vehicle performance
- Transmissions
 - Geared drives and transmissions
 - Matching of engine and transmissions for efficiency or dynamic performance
 - Inertia of rotating bodies, mass equivalent of rotating parts
 - Friction systems: clutches and brakes
- Data acquisition and simulation as a motorcycle performance tool
 - Analysing real dynamic data from controlled tests and full track activities
 - Developing basic motorcycle dynamics simulation model

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☒ **Written exam** ☐ **Coursework** ☐ **Practical**

Mode of assessment	Volume	Weighting
Exam	2 hours	50%

Assessment Component 2

☐ **Written exam** ☒ **Coursework** ☐ **Practical**

Mode of assessment	Volume	Weighting
Assessment of practical work	2500 words	50%

Assessment Summary

Activity type	Percentage
Written exam	50%
Coursework	50%
Practical	
TOTAL	100%

AHEP3 Version 3 outcomes to be met:

SM1b, SM2b, EA1, EA2, EA3b, EA4b, D3b, P1, P3, P4, P8

INDICATIVE READING LIST

Module Code	ACHA5004	
Module Title	Motorcycle Dynamics	
Classification	Reading List entry	Electronic*
Essential	Cossalter, V., Motorcycle Dynamics, LULU; 2nd ed. edition (2 Oct. 2006)	☐
Further	Bradley, J., The Racing Motorcycle: A Technical Guide for Constructors volumes 1 and 2, (Broadband Leisure Publications, 2003)	☐
Further	Spalding, N., MotoGP Technology 3rd Edition : Phoebus Apollo Publishing Limited, 2017	☐
Further	Foale, T., Motorcycle Handling and Chassis Design (Tony Foale, 2002)	☐
Further	Yi Zheng. Automotive Power Transmissions. (Wiley 2018).	☐

Module Code	ACHA5009
Title	Motorsport Dynamics
Date	17/09/2020
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To understand the fundamental processes governing suspension design and specification on the ride and handling characteristics of a motorsport vehicle and the methods available for their analysis

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- demonstrate knowledge and understanding of the fundamental factors influencing the handling and performance of motorsport vehicles and simulation as an evaluation tool
- Investigate power transmission and braking systems and their influence on vehicle behaviour

INDICATIVE CONTENT

- Vehicle Dynamics
 - suspension as a kinematic system
 - tyre performance and control
 - bicycle model behaviour
 - load transfer under longitudinal and lateral acceleration
 - steady state vehicle balance
- Aerodynamics
 - Principles
 - Aerodynamic devices
 - Influence on vehicle performance
- Transmissions
 - geared drives and transmissions
 - matching of engine and transmissions for efficiency or dynamic performance
 - inertia of rotating bodies, mass equivalent of rotating parts
 - friction systems: clutches and brakes
- Data acquisition and simulation as a vehicle dynamics performance tool
 - Analysing real dynamic data from controlled tests and full track activities
 - Developing basic vehicle dynamics simulation model

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☒ **Written exam** ☐ **Coursework** ☐ **Practical**

Mode of assessment	Volume	Weighting
Exam	2 hours	50%

Assessment Component 2

☐ **Written exam** ☒ **Coursework** ☐ **Practical**

Mode of assessment	Volume	Weighting
Assignment of Practical work	2500 words	50%

Assessment Summary

Activity type	Percentage
Written exam	50%
Coursework	50%
Practical	
TOTAL	100%

AHEP3 Version 3 outcomes to be met:
SM1b, SM2b, EA1b, EA2, EA3b, EA4b, P1, P3, P4

INDICATIVE READING LIST

Module Code	ACHA5009	
Module Title	Motorsport Dynamics	
Classification	Reading List entry	Electronic*
Essential	Bastow, Donald. Geoffrey. Howard, and John P. Whitehead. <i>Car Suspension and Handling</i> . 4th ed. Bury St. Edmunds: Warrendale, Pa.: Professional Engineering; SAE International, 2004. Print.	☐
Essential	Gillespie, T. D. <i>Fundamentals of Vehicle Dynamics</i> . Warrendale, Pa.: Society of Automotive Engineers, 1992. Print.	☐
Essential	Hillier V and Coombes, P., <i>Fundamentals of Motor Vehicle Technology</i> (Stanley Thornes, 2004)	☐
Essential	Guiggiani, M., <i>The Science of Vehicle Dynamics</i> 2nd Edition (Springer 2018)	☐
Essential	Milliken, William F., and Milliken, Douglas L. <i>Race Car Vehicle Dynamics</i> . Warrendale, Pa.: Society of Automotive Engineers, 1995. Print.	☐
Essential	Schüetz, Thomas. <i>Aerodynamics of Road Vehicles</i> . Fifth ed. 2016. Print.	☐
Further	Heywood, J., <i>Internal Combustion Engine Fundamentals</i> (McGraw Hill, 1989)	☐
Further	Jacobson, Bengt. <i>Vehicle Dynamics Compendium</i> . 2017. Web.	☒
Further	Pacejka, Hans. <i>Tire and Vehicle Dynamics</i> . 2nd ed. Elsevier Science, 2005. Web.	☒
Further	Rowley, W., <i>An Introduction to Race Car Engineering</i> - 3 rd Edition (Rowley Race Dynamics, 2005)	☐
Further	Staniforth, A., <i>Competition Car Suspension: A Practical Handbook</i> (Haynes, 2006)	☐
Further	Stone R, <i>Introduction to Internal Combustion Engines</i> (Macmillan 1999)	☐
Further	Yi Zheng. <i>Automotive Power Transmissions</i> . (Wiley 2018).	☐

Module Code	ACHA5010
Title	Alternative Propulsion Systems
Date	17/09/2020
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To develop the student's ability to analyse the operating systems required for alternative powertrain technologies and to enable the investigation of powertrain system design for alternative storage and propulsion methods including kinetic energy recovery systems.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Investigate the systems required for electric and hybrid storage and propulsion systems.
- Evaluate alternative powertrain designs and energy recovery systems.

INDICATIVE CONTENT

- Internal combustion engine operating conditions
- Vehicle operating conditions and duty cycles
- Reversible energy storage principles, including chemical, electrical and mechanical
- Kinetic energy recovery system
- Energy conversion principles
- Electrical Principles
- Electric propulsion systems
- Hybrid systems
- Alternative powertrain operating strategies.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Written report	2500 words	50%

Assessment Component 2

☒ Written exam ☐ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Exam	2 hours	50%

Assessment Summary

Activity type	Percentage
Written exam	50%
Coursework	50%
Practical	0%
TOTAL	100%

AHEP3 Version 3 outcomes to be met:
SM1b, SM3b, EA1b, EA2, EA4b, D4, EL4, EL6, P2, P4

INDICATIVE READING LIST

Module Code	ACHA5010	
Module Title	Alternative Propulsion Systems	
Classification	Reading List entry	Electronic*
Essential	Modern electric, hybrid electric, and fuel cell vehicles: fundamentals, theory, and design. (CRC Press 2018)	☒
Essential	https://batteryuniversity.com/	☒
Further	Electric motors and drives, fundamentals, types and applications (Elsevier 2013)	☒
Further	Electric and Hybrid Vehicle Technology International. (UKIP Media and Events Ltd). https://www.electrichybridvehicletechnology.com/	☐
Further	Racecar Engineering – (The Chelsea Magazine Company)	☐
Further	http://www.electricmotorsport.com/	☒
Further	http://www.avt.uk.com/	☒
Further	http://www.fiaformulae.com/	☒
Further	http://www.dft.gov.uk/vca/	☐

Module Code	ACHA5011
Title	Thermodynamics & Combustion
Date	17/09/2020
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- Understand the major design principles of the modern Vehicle Powertrain System in terms of its power producing capability, drive-cycle fuel economy and emissions.
- To introduce the student to fundamental thermodynamic theories and their application to automotive vehicle systems

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Validate their understanding of cylinder-head and valve-train design principles and their effects on combustion performance and emissions through analysis, test and measurement, with a focus on efficiency and legislation.
- Utilise the fundamental concepts in thermodynamics to solve problems in automotive applications including internal combustion engines and heat exchangers.

INDICATIVE CONTENT

- Determination of the performance of vehicle systems and emissions
- Practical analysis of power producing components of state-of-the-art engines
- Valve-train design and Camshaft analysis
- Analysis of exhaust and intake manifolds including pulse tuning
- Engine design requirements for both emissions and performance.
- Ideal and real engine cycles
- Heat release mechanisms during combustion introducing the Wiebe function
- Effects of combustion chamber, piston design and compression ratio on combustion characteristics and rate of heat release
- The First Law of Thermodynamics
- The Second Law of Thermodynamics and Cyclic systems.
- Cycle efficiencies, irreversibility and entropy
- Modes of heat transfer: conduction (Fourier's Law); convection – fluid flow, properties and geometric factors. Radiation (Steffan/Boltzmann Equation)

- Fundamentals of heat exchanger design and applications in the automotive industry.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Coursework	2500 words	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Coursework	2500 words	50%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	100%
Practical	0
TOTAL	100%

AHEP3 Version 3 outcomes to be met:

SM1b, EA1b, EA2, D3b, D4, EL1, EL4, P2, P3, P5, P8, G1

INDICATIVE READING LIST

Module Code	ACHA5011	
Module Title	Thermodynamics & Combustion	
Classification	Reading List entry	Electronic*
Essential	Heywood, J., Internal Combustion Engine Fundamentals 2ED, McGraw-Hill Education; 2 edition (31 May 2018)	☐
Essential	Thermodynamics: Concepts and Applications, Cambridge University Press; Har/Cdr edition (6 Mar. 2006)	☐
Essential	Bosch - <i>Bosch Automotive Handbook</i> 9 th Edition (Bosch, 2014)	☐
Essential	Nise, N.S. Control Systems Engineering, 8 th Edition (John Wiley & Sons, 2019)	☐
Essential	Cengel, Y., Boles, M., Thermodynamics: An Engineering Approach, 9 th Edition (McGraw-Hill Education, 2018)	☐
Further	Dorf, R.C., Bishop, R.H., Modern Control Systems, 13 th Edition (Pearson, 2017)	☐
Further	DiStefano, J.J., Stubberud A.R., Williams, I.J., Schaum's Outline of Feedback and Control Systems, 3 rd Edition. (McGraw-Hill Education, 2013)	☐
Further	Hillier V – <i>Fundamentals of Automotive Electronics</i> , 6 th Edition, (Nelson Thornes, 2012)	☐
Further	Bennick A – <i>Vehicle Electronics Systems</i> , (Routledge, 1998)	☐
Further	SAE Journals	☒
Further	IMechE Journal	☒

Module Code	ACHA5012
Title	Engineering Management
Date	17/09/2020
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To introduce the student to the social and commercial context of the engineering industry in terms of business environments including: management organisation and project management, financial management and marketing.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Show detailed knowledge and understanding of the relationship between an engineering organisation and the industrial, socio-economic and environmental context in which it is found.
- Demonstrate subject specific skills and cognitive skills in recognising and evaluating accounting methods, planning, costing and monitoring projects, workforce motivation and team dynamics.

INDICATIVE CONTENT

- Business organisations and the environment: types of business organisations; analysis of the organisation and its external environment; the engineering industry in the UK and global economy.
- Regulation and Legislation: product liability and contractual obligations, data protection legislation, protection of intellectual property.
- Business ethics: Corporate social responsibility, the engineer's responsibility to society.
- Management and Group Behaviour: management and leadership styles; management roles; management decision making and problem solving; management of change; motivation; quality management; group behaviour and dynamics; individual behaviour; personality and perception.
- Financial and Management Accounting: financial statements; cash flow; capital expenditure and revenue; cost behaviour; budgets.
- Marketing: the marketing mix; sponsorship funding models, pricing of goods and services.
- Project management: Project planning techniques, project monitoring, managing risk.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Assignment	2500 words	50%

Assessment Component 2

☒ Written exam ☐ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Exam	2 hours	50%

Assessment Summary

Activity type	Percentage
Written exam	50%
Coursework	50%
Practical	
TOTAL	100%

AHEP3 Version 3 outcomes to be met:

D1, D2, D5, EL1, EL2, EL3b, EL5, EL6, P5, P7, P11b, G3b

INDICATIVE READING LIST

Module Code	ACHA5012	
Module Title	Engineering Management	
Classification	Reading List entry	Electronic*
Essential	Krietner, R., Principles of Management 12th Edition (South Western College, Jan 2012)	☐
Essential	Maylor, H., Project Management 4th Edition (FT Prentice Hall, 2010)	☒
Essential	Mullins L.J, H., Management and Organisational Behaviour (Pearson Education, 2013)	☒
Further	Bowen, R., Engineering Ethics (Springer International Publishing, 2014)	☒
Further	Masterman, G., Sponsorship – for a Return on Investment Butterworth (Heinemann, 2007)	☒
Further	Kotler, P., Principles of Marketing 17th Edition (FT Prentice Hall, 2018)	☒
Further	Dyson, J., Accounting for Non-Accounting Students 9th Edition (FT Prentice Hall, 2017)	☐
Further	General Management www.mindtools.com	☒
Further	Sustainable Business http://www.edie.net/index.asp	☒

Module Code	ACHA5013
Title	Automotive Chassis Systems
Date	17/09/2020
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To understand the fundamentals of Automotive chassis and transmission systems

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- demonstrate knowledge and understanding of the automotive chassis including, body structures, crash worthiness and aerodynamics.
- Investigate power transmission and braking systems and their influence on vehicle behaviour

INDICATIVE CONTENT

- Body Structures design
 - Conceptual design and chassis types
 - Bending, torsion, Longitudinal loads, lateral loads
 - Fatigue
 - Types of BIW
 - Manufacture methods
- Crash worthiness
 - Frontal (ODB and FFB)
 - Side (Barrier, pole and IIHS)
 - Occupant (adult and child)
 - Autonomous Vehicles
 - Pedestrian impact
 - Safety Assist systems
- Aerodynamics
 - Principles
 - Aerodynamic devices
 - Influencing on vehicle performance
- Transmissions and rotating systems
 - geared drives and transmissions
 - matching of engine and transmissions for efficiency or dynamic performance
 - inertia of rotating bodies, mass equivalent of rotating parts
 - friction systems: clutches and brakes

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☒ **Written exam** ☐ **Coursework** ☐ **Practical**

Mode of assessment	Volume	Weighting
Exam	2 hours	50%

Assessment Component 2

☐ **Written exam** ☒ **Coursework** ☐ **Practical**

Mode of assessment	Volume	Weighting
Assignment	2500 words	50%

Assessment Summary

Activity type	Percentage
Written exam	50%
Coursework	50%
Practical	
TOTAL	100%

AHEP3 Version 3 outcomes to be met:
SM1b, SM2b, EA1b, EA2, EA4b, P1, P2, P4

INDICATIVE READING LIST

Module Code	ACHA5013	
Module Title	Automotive Chassis Systems	
Classification	Reading List entry	Electronic*
Essential	Motor Vehicle Structures: Concepts and Fundamentals (Brown & Serpento, 2001)	☐
Essential	EuroNCAP website (https://www.euroncap.com/)	☐
Essential	Gillespie, T. D. <i>Fundamentals of Vehicle Dynamics</i> . Warrendale, Pa.: Society of Automotive Engineers, 1992. Print.	☐
Essential	Hillier V and Coombes, P., <i>Fundamentals of Motor Vehicle Technology</i> (Stanley Thornes, 2004)	☐
Essential	Schüetz, Thomas. <i>Aerodynamics of Road Vehicles</i> . Fifth ed. 2016. Print.	☐
Further	Yi Zheng. <i>Automotive Power Transmissions</i> . (Wiley 2018).	☐
Further	Jacobson, Bengt. <i>Vehicle Dynamics Compendium</i> . 2017. Web.	☒
Further	<i>Automotive Steel Design Manual</i> (American Iron and Steel institute, 2002)	☐
Further	<i>The Aluminium Automotive Manual</i> (European Aluminium Association, 2013)	☐
Further	Stone R, <i>Introduction to Internal Combustion Engines</i> (Macmillan 1999)	☐

Module Code	ACHA5014
Title	Group Design Project
Date	17/09/2020
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To study the principles of effective research, design and development and leads to a group project involving one or more of the major topic areas of the programme being studied as well as creating an understanding of research concepts and the development of research competencies, including project management.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- show a detailed knowledge and understanding of project management strategies in the planning, researching, implementing and documenting progress and achievement and demonstrate subject specific skills with respect to planning and executing an engineering project within time and budget constraints, considering the environment and sustainability
- demonstrate key transferable skills in working as part of a team, time management, communication and presentation skills.

INDICATIVE CONTENT

- Systematic design and development procedures.
- CAE, CAD and engineering design
- Research methodologies and techniques.
- Objective design and development selection.
- Project planning.
- Statistical techniques and evaluation.
- Cost prediction, manufacturing and sustainability.
- Quality and reliability.
- Technical report writing.
- Group working and management.
- Communication skills.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0
TOTAL	200	100%

ASSESSMENT

Assessment will be by means of an interim viva reflecting on progress and project specification followed by a group report and supporting viva documenting the completion of the project carried out.

ASSESSMENT

Assessment Component 1

☐ Written exam ☐ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Interim Viva	15 minutes	30%

Assessment Component 2

☐ Written exam ☐ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Final Project Viva	12 minutes	20%

Assessment Component 3

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Written Project report	2500 words (per member of group)	50%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	50%
Practical	50%
TOTAL	100%

AHEP3 Version 3 outcomes to be met:

D1, D2, D3b, D5, D6, EL3b, P1, P2, P4, P8, P11b, G1, G2, G3b, G4

INDICATIVE READING LIST

Module Code	ACHA5014	
Module Title	Group Design Project	
Classification	Reading List entry	Electronic*
Essential	Maylor, H., Project Management 4th Edition (FT Prentice Hall, 2010)	☐
Further	Seppala, N., Business Ethics and Corporate Social Responsibility (Cengage Learning, 2010)	☐
Further	Masterman, G., Sponsorship – for a Return on Investment Butterworth (Heinemann, 2007)	☐

Module Code	ACHA5015
Title	Stress Analysis & CAE
Date	17/09/2020
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- This module advances students' knowledge of both 2D and 3D CAD drafting and solid modelling and their understanding of the engineering design process in conjunction with the principles of stress analysis.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Demonstrate knowledge and understanding of the use of appropriate design methods in conjunction with advanced features of a 3D CAD system in engineering design. Whilst showing subjective specific skills in the use of computational methods and the principles of stress analysis for the manufacture and appraisal of mechanical components.
- Show cognitive skills with respect to the formulation and modelling of real engineering problems and applying mathematical methods of analysis and applying appropriate theoretical and practical methods in problem formulation and decision-making, interpreting experimental results.

INDICATIVE CONTENT

- The design process – introduction to modern CAE techniques, and their impact on the design process.
- Introduction to Finite Element Analysis
- Complex stress including:
 - Principal planes and principal stresses;
 - Construction and interpretation of Mohr's circle;
- The slope and deflection of beams - Macaulay's method and principle of superposition.
- Application in thick and thin walled pressure vessels.
- Further techniques for component synthesis in 3D CAD systems: eg. Extrusion, revolving, patterning, Boolean operations, parametric methods, lofting and sweep methods, surfacing approaches, assembly modelling and assembly animation.
- 2D CAD drafting, dimensioning and introduction geometric tolerancing.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☐ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Practical Assessment	2 Hour Practical Assessment	50%

Assessment Component 2

☒ Written exam ☐ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Exam	2 Hours	50%

Assessment Summary

Activity type	Percentage
Written exam	50%
Coursework	0%
Practical	50%
TOTAL	100%

AHEP3 Version 3 outcomes to be met:
SM1b, SM2b, EA2, EA3b, EA4b, P2, P3, P6, G1

INDICATIVE READING LIST

Module Code	ACHA5015	
Module Title	Stress Analysis & CAE	
Classification	Reading List entry	Electronic*
Essential	Hearn, E.J. <i>Mechanics of Materials</i> , vols.1 & 2, Butterworth-Heinemann, 1997	☐
Essential	K. Lee, <i>Principles of CAD/CAM/CAE Systems</i> (Addison Wesley 1999)	☐
Essential	C. McMahon & J Browne <i>CAD/CAM Principles, Practice & Manufacturing Management</i> (Prentice Hall 1998)	☐
Essential	Mac Donald, Bryan J. <i>Practical Stress Analysis with Finite Elements</i> . 2nd ed. Dublin: Glasnevin, 2011. Print.	☐
Further	M. Fitzpatrick <i>Machining and CNC technology</i> (McGraw-Hill Higher Education 2004)	☐
Further	A.D. Dimarogonas, <i>Machine Design: a CAD Approach</i> (Wiley 2001)	☐
Further	O. Molloy et al <i>Design for Manufacturing & Assembly</i> (Kluwer Academic Publisher	☐
Further	C. Poli, <i>Design for Manufacturing: a Structured Approach</i> (Butterworth-Heinemann	☐
Further	Science Direct (https://www.sciencedirect.com/)	☒

Module Code	ACHA5016
Title	Advanced Automotive Surfacing
Date	05/05/2021
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To develop competence and proficiency in the use of surfacing modelling software in the detailing of design solutions and the production of technical and realistic output formats for design consideration

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Use advanced 3D surface modelling tools to create realistic design solutions within a structured modelling workflow and understanding of render workflow and render control.
- Apply an understanding of tolerance setting for data transfer to prototype modelling software; demonstrating knowledge of CNC and Rapid Prototyping data protocols.

INDICATIVE CONTENT

- Modelling Strategies
- Curve evaluation tools
- Surface Workflow & Continuity: Theory and Practice
- Rendering types and render management
- CNC/Rapid prototyping data transfer practice
- A Class surfacing
- Sub D modelling
- Animation Control

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

(Tick one)

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Advanced Surface modelling and visualisation of a vehicle	2400 words equivalent	60%

Assessment Component 2

(Tick one)

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Design for Prototyping	1600 words equivalent	40%

Assessment Summary

Activity type	Percentage
Written exam	
Coursework	100%
Practical	
TOTAL	100%

INDICATIVE READING LIST

Module Code	ACHA5016	
Module Title	Advanced Automotive Surfacing	
Classification	Reading List entry	Electronic*
Essential	https://knowledge.autodesk.com/support/alias-products/learn	☒
Essential	Alias Learning Tools (2006) <i>Learning Design with Alias Studio Tools</i> . John Wiley & Sons.	☐
Essential	www.autodesk.com	☒
Further	www.carbodydesign.com	☒
Further	https://danielsimon.com/	☒
Further	https://www.behance.net/search/projects?field=automotive%20design	☒
Further	Cardesignnews.com	☒
Essential	https://www.youtube.com/c/HandleBar3D/videos	☒

Module Code	ACHA5017
Title	Advanced Digital Visualisation
Date	05/05/2021
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To develop advanced knowledge, understanding and skills in the use of 2D digital computer visualisation techniques for the development and communication of industrial design proposals.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Understand and apply advanced digital visualisation techniques using industry standard software platforms.
- Create high quality imagery to effectively represent and communicate design intentions at varying stages of the automotive and transport design process.

INDICATIVE CONTENT

- Adobe Photoshop & Illustrator
- Image Manipulation and Masks
- Layer Effects and Manipulation
- Creating Custom Brush Sets
- Autodesk Alias & Sub D Modelling.
- Using Geometry for Sketching
- Working With Canvases in 3D Environment
- Canvas Sketch Projection onto 3D Geometry

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1 (Tick one)

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Portfolio	Design Visualisation Portfolio equivalent to 4000 words.	100%

Assessment Summary

Activity type	Percentage
Written exam	
Coursework	100%
Practical	
TOTAL	100%

INDICATIVE READING LIST

Module Code	ACHA5017	
Module Title	Advanced Digital Visualisation	
Classification	Reading List entry	Electronic*
Essential	https://knowledge.autodesk.com/support/alias-products/learn	☒
Essential	Faulkner A., Chavez C. (2019) <i>Adobe Photoshop Classroom in a Book</i> . Adobe.	☐
Further	http://www.carbodydesign.com/tutorials/2d/sketchbook-pro-tutorials	☒
Further	https://www.behance.net/search/projects?field=automotive%20design	☒
Essential	Robertson, S. (2014) <i>How to render: the fundamentals of light, shadow and reflectivity</i>	☐
Essential	Robertson, S. (2013) <i>How to draw: drawing and sketching objects and environments</i>	☐
Further	https://www.youtube.com/c/HandleBar3D/videos	☒

Module Code	ACHA5018
Title	Changemakers: Building your Personal Brand for Sustainable Employment
Date	25/06/2020
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To build the skills and competencies necessary for career resilience and professional development for the future work context.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Evaluate personal employability skills and their congruence with the skills required for professional practice in a real or simulated environment.
- Build a personal brand and promote a professional identity for a specific opportunity.

INDICATIVE CONTENT

- Analysing your employment sector in order to identify problems, gaps in the market and how you can add value for sustainable employability.
- Building your brand and promoting a professional identity through personal skills analysis and personal development planning.
- Contemporary technologies: developing an online personal presence (e.g. basic website building/social media/blogs/vlogs etc.).
- Search techniques for employment/self-employment opportunities.
- Adopting project management approaches (defining the problem; setting the goals and objectives, milestones and monitoring, evaluation).
- Collaboration, networking, building social capital, negotiation and influencing.
- Awareness, emotional intelligence, well-being and resilience.
- Ethics, values, diversity, inclusion, intercultural awareness and responsible stewardship: issues, challenges and actions.
- Cultural and linguistic expression.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning		
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Online portfolio	2,000 words or equivalent	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Assignment	2,000 words or equivalent	50%

Assessment Summary

Activity type	Percentage
Written exam	
Coursework	100%
Practical	
TOTAL	100%

INDICATIVE READING LIST

This will be guided by the student's subject area.

Module Code	ACHA5018	
Module Title	Changemakers: Building your Personal Brand for Sustainable Employment	
Classification	Reading List entry	Electronic*
Essential	Lock, D. (2018). <i>Project management</i> . Routledge	☒
Essential	Dweck, C. (2017) <i>Mindset: Changing The Way You think To Fulfil Your Potential</i> . Robinson Publishers.	☒
Essential	Griffith, B.A. (2014) <i>Working in Teams: Moving From High Potential to High Performance</i> . SAGE Publications Inc.	☒
Essential	Baguley, P. (2003). <i>Teams and team-working</i> (New ed.). London: Teach Yourself.	☐
Essential	Gensler, H. J. (2017). <i>Ethics : A contemporary introduction</i> (3rd ed., Routledge contemporary introductions to philosophy). New York: Routledge.	☐
Essential	Well-being of Future Generations (Wales) Act 2015 (Online). Available at http://www.legislation.gov.uk/anaw/2015/2/contents/enacted	☒
Further	Smale, B. and Fowlie, J. (2015) <i>How to Succeed at University an Essential Guide to Academic Skills and Personal Development</i> (2nd Ed.). Los Angeles, [Calif.]: SAGE Study Skills Ser. Web.	☒
Further	Phillips, S. (2014) <i>The complete guide to professional networking : the secrets of online and offline success</i> .	☒

	London, England : Kogan Page	
Further	Snow, S. (2018) <i>Dream Teams: Working Together Without Falling Apart</i> . Piatkus.	☒
Further	Williams, B. (2020) <i>Diversity in the Workplace: Eye-Opening Interviews to Jumpstart Conversations about Identity, Privilege, and Bias</i> . Rockridge Press	☒
Further	Dawson, P. and Andriopoulos, C. (2017) <i>Managing Change, Creativity and Innovation</i> . SAGE Publications Ltd.	☒
Further	Clements, P., & Jones, J. (2008). <i>The diversity training handbook a practical guide to understanding & changing attitudes</i> (3rd ed.). London ; Philadelphia: Kogan Page.	☒

Module Code	ACHA5019
Title	Changemakers: Creativity and Value Creation
Date	25/06/2020
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To develop the concepts and practice of creativity and value creation for the development of innovative, aspiring and progressive solutions.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Demonstrate knowledge and critical understanding of innovation, creativity and enterprising mindset, recognising the values and the contribution creativity makes to the common good.
- Conceive, articulate and apply creative thinking within a work-based or academic context to develop novel solutions and/or value creation.

INDICATIVE CONTENT

- Creativity in theory and practice.
- Value creation in theory and practice.
- Creative and ethical leadership: skills and challenges.
- Driving innovation and change, the intra and entrepreneurial individual.
- Critical thinking, troubleshooting and problem solving, developing novel solutions.
- Information gathering for inspiration, vision creation and ideation.
- Developing the enterprising and data driven mindset.
- Contemporary technologies: virtual and augmented reality and artificial intelligence to enhance creativity and innovation.
- Time management practices for an entrepreneurial mindset.
- Being resourceful, in the context of making do with less.
- Reflection and self-reflection.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning		
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Online portfolio of set exercises	2,000 words or equivalent	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Assignment	2,000 words or equivalent	50%

Assessment Summary

Activity type	Percentage
Written exam	
Coursework	100%
Practical	
TOTAL	100%

INDICATIVE READING LIST

This will be guided by the student's subject area.

Module Code	ACHA5019	
Module Title	Changemakers: Creativity and Value Creation	
Classification	Reading List entry	Electronic*
Essential	Hargreaves, J., and Page, L. (2013) <i>Reflective Practice</i> . (Key Themes in Health and Social Care Series). Polity Press.	☒
Essential	Nardi, P.M. (2017) <i>Critical Thinking : Tools for Evaluating Research</i> . University of California Press	☒
Essential	Westerman, G., Bonnet, D. and McAfee, A., <i>Leading Digital: Turning Technology Into Business Transformation</i> . (Audiobook) Recorded Books. 2017.	☒
Further	Schiuma, G. (2011) <i>Managing Knowledge Assets and Business Value Creation in Organizations : Measures and Dynamics</i> Hershey, Pa.: Business Reference Service	☒
Further	Rescher, N. (2014). <i>A System of Pragmatic Idealism, Volume II The Validity of Values, A Normative Theory of Evaluative Rationality</i> (Princeton Legacy Library). Princeton: Princeton University Press.	☒
Further	Turner, E. (2020) <i>Be Less Zombie: How great companies create dynamic innovation, fearless leadership and passionate people</i> . John Wiley & Sons.	☒

Module Code	ACHA5020
Title	Independent Professional Placement
Date	05/05/2021
Level	5
Credits	0
Pre-Requisites	None

AIM(S)

- To introduce the student to real experience of the commercial context of the creative industry in terms of business environments including: interpersonal skills, management organisation and administration, regulation and legislation, finances and marketing within applied creative practice.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Show detailed knowledge and advanced understanding of the relationship between a creative organisation and the commercial, socio-economic and environmental context in which it is found.
- Apply subject specific skills and cognitive skills in recognising and evaluating creative methods, planning, marketing, costing and monitoring projects, motivational approaches and team dynamics.
- Take personal responsibility for the development of key transferable skills in self-management, organisational skills, leadership and decision making, self-reflection and communication skills.

INDICATIVE CONTENT

- Business organisation and the commercial environment.
- The creative industries in the UK and global economy.
- Sustainable practices.
- Regulation and legislation.
- Business ethics and the designer's responsibility to society.
- Management and leadership.
- Financial management.
- Marketing.
- Project planning and management.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	-	-
Independent learning	-	-
Placement learning	600	100%
TOTAL	600	100%

ASSESSMENT

Assessment Component 1

(Tick one)

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Placement Portfolio	6 elements, or equivalent	75%

Assessment Component 2

(Tick one)

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Written Report	2000 words	25%

Note: this sandwich placement is not awarded a mark. It is either Pass or Fail

Assessment Summary

Activity type	Percentage
Written exam	
Coursework	100%
Practical	
TOTAL	100%

INDICATIVE READING LIST

Specific to the requirements of the placement provider and activities of the student as agreed with the Placement Coordinator.

Module Code	ACHA5021
Title	Professional Practice 1
Date	05/05/2021
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To develop the contextual and detailed design development skills in the generation of conceptual product, automotive and transportation solutions and strengthen both traditional and digital techniques appropriate for effective design development and professional communication.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Apply design development methods in the form of idea generation, concept development and realisation to given design opportunities;
- Evaluate design statements with objectivity and communicate the resulting proposals effectively through 2D and 3D media;
- Apply a sound knowledge and understanding of the product/vehicle's aesthetics, user interaction, architecture and enabling technology in a manner appropriate to their specific award pathway.

INDICATIVE CONTENT

- Design integration
- Design evaluation
- Design validation
- Design realisation

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

(Tick one)

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Design Project	3200 words equivalent	80%

Assessment Component 2

(Tick one)

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Design Project	800 words equivalent	20%

Assessment Summary

Activity type	Percentage
Written exam	
Coursework	100%
Practical	
TOTAL	100%

INDICATIVE READING LIST

Module Code	ACHA5021	
Module Title	Professional Practice 1	
Classification	Reading List entry	Electronic*
Essential	Dan Cuffaro, (2013) <i>The Industrial Design Reference & Specification Book: Everything Industrial Designers Need to Know Every Day</i>	☐
Essential	Design Studio Press, Stuart Macey (2014) H POINT	☐
Further	https://www.behance.net/search/projects?field=automotive%20design	☒
Further	Danielsimon.com	☒
Further	Sydmead.com	☒
Further	Cardesignnews.com	☒
Further	Carbodydesign.com	☒

Module Code	ACHA5022
Title	Professional Practice 2
Date	05/05/2021
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To provide experience of working within a group environment, in liaison, where possible, with an industrial partner, in order to design a product, vehicle, system or service.
- To provide the students with an opportunity to experience group dynamics and develop communication and project management skills to a professional standard.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Identify problems, contribute solutions and communicate appropriate outcomes in a considered and professional manner;
- Work as a member of a multidisciplinary team in achieving a set of shared objectives as defined by the scope of the project.

INDICATIVE CONTENT

- Decision-making & Problem solving techniques
- Project planning & management
- Design communication
- Professional awareness

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

(Tick one)

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Design Project	4000 words equivalent	100%

Assessment Summary

Activity type	Percentage
Written exam	
Coursework	100%
Practical	
TOTAL	100%

INDICATIVE READING LIST

Module Code	ACHA5022	
Module Title	Professional Practice 2	
Classification	Reading List entry	Electronic*
Essential	Dan Cuffaro, (2013) <i>The Industrial Design Reference & Specification Book: Everything Industrial Designers Need to Know Every Day</i>	☐
Essential	Stuart Macey (2014), <i>H POINT</i> . Design Studio Press	☐
Further	https://www.behance.net/search/projects?field=automotive%20 design	☒
Further	Danielsimon.com	☒
Further	Sydmead.com	☒
Further	Cardesignnews.com	☒
Further	Carbodydesign.com	☒

Module Code	ACMA5005
Title	Six Sigma Green Belt
Date	05/08/2020
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To enable the student to apply the DMAIC problem-solving methodology to a green belt standard on a product/service, process operation.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- To utilise a range of tools and techniques when applying the six sigma DMAIC methodology to a chosen problem
- To undertake a Six Sigma Green Belt project

INDICATIVE CONTENT

- Six Sigma- what is it, benefits and weaknesses applications and its uses
- Define – Developing problem statements, the customer, project charter, process mapping
- Measure – Sources of variation, FMEA analysis, data collection, process capability and measurements system analysis
- Analyse – graphical tools, roots cause analysis, sources of variation and review analysis methods
- Improve – generate improvement alternative, improve FMEA phase, cost/benefit analysis, future state process map, piloting and validate improvements
- Control – Develop control strategy, develop control plan and SOP and training plan
- Quality tools and techniques – Pareto Analysis, Cause and Effect analysis, Process Mapping, Gage R & R studies, capability studies, FMEA and data collection analysis
- Quality systems – their role in assuring quality and business management, principles of quality management and different quality standards (ISO 9001: 2015, ISO 17025 and TS/ISO 16949)

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☒ Written exam ☐ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Examination 1 (Open Book)	1.5 hour	50%

Assessment Component 2

☒ Written exam ☐ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Examination 2 (Open Book)	1.5 hour	50%

Assessment Summary

Activity type	Percentage
Written exam	100
Coursework	0
Practical	0
TOTAL	100%

AHEP 3 Version 3 Outcomes to be met:

SM2b, EA4b, P7

INDICATIVE READING LIST

Module Code	ACMA5005	
Module Title	Six Sigma Green Belt	
Classification	Reading List entry	Electronic*
Essential	Pyzdek, T (2018) The Six Sigma Handbook, 5 th Edition, McGraw Hill Education, United States	☐
Essential	Muroe, A (2007) The Certified Six Sigma Green Belt Handbook, ASQ Quality Press, Milwaukee	☐
Essential	Bicheno, J and Holweg, M (2016) The Lean Toolbox, 5 th Edition, Picsie Books, Buckingham	☐
Further	Dale, B. Bamford, D and Van der Wiele, T (2016) Managing Quality: An Essential Guide and Resource Gateway, 6 th Edition, John Wiley & Sons, Chichester	☐
Further	Russell, R.S (2009) Operations Management, John Wiley & Sons, USA	☐
Further	Trivium (2019) Six Sigma Green Belt Study Guide 2019: Trivium Test Prep	☐
Further	Setter, C (2018) Six Sigma: A Complete Step-by-Step Guide, Council for Six Sigma Certification, Buffalo	☐
Further	Barsalou, M (2014) Root Cause Analysis, Productivity Press, Boca Raton	☐
Further	Sartor, M and Orzes, G (2019) Quality Management: Tools, Methods and Standards, Emerald Publishing Limited, Bingley	☐
Further	Slack, N and Brandon-Jones, A (2019) Operations Management, 9 th Edition, Pearson, Harlow	☐
Further	Stevenson, W (2018) Operations Management, McGraw Hill Education, New York	☐
Further	Computers and Industrial Engineering	☒
Further	European Journal of Operations Research	☒
Further	International Journal of Production Economics	☒
Further	International Journal for Project Management	☒
Further	Journal of Cleaner Production	☒
Further	Journal of Manufacturing Systems	☒
Further	Journal of Operations Management	☒
Further	Journal of Purchasing and Supply Management	☒
Further	Operations Research Perspectives	☒
Further	Reliability Engineering and System Safety	☒
Further	www.quality.org	☒
Further	www.asp.org	☒
Further	www.isixsigma.com	☒
Further	www.cips.org	☒

Module Code	ACMA5009
Title	Group Project
Date	05/08/2020
Level	5
Credits	20
Pre-Requisites	None

AIM(S)

- To study the principles of effective research, design and development and leads to a group project involving one or more of the major topic areas of the programme being studied as well as creating an understanding of research concepts and the development of research competencies, including project management.

Where students have completed a work placement;

- To reflect upon the experiences gained during a 6 week industrial placement that took place during the end of the first year of the programme

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- show a detailed knowledge and understanding of project management strategies in the planning, researching, implementing and documenting progress and achievement and demonstrate subject specific skills with respect to planning and executing an engineering project within time and budget constraints, considering the environment and sustainability
- show cognitive skills in the research and analysis of technical and business concerns and how these may conflict
- demonstrate key transferable skills in working as part of a team, time management, communication and presentation skills.

INDICATIVE CONTENT

- Systematic design and development procedures.
- CAE, CAD and Engineering Design
- Research methodologies and techniques.
- Objective design and development selection.
- Project Planning.
- Statistical Techniques and Evaluation.
- Cost prediction, manufacturing and sustainability.
- Quality and reliability.
- Technical report writing.
- Group working and management.
- Communication skills.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0
TOTAL	200	100%

ASSESSMENT

Where student conducts a work placement;

Assessment will be by means of a report reflecting on the work placement undertaken and a group report and supporting viva documenting the group project carried out.

OR

Where student does not conduct a work placement;

Assessment will be by means of an interim viva reflecting on progress and project specification followed by a group report and supporting viva documenting the completion of the project carried out.

Assessment Component 1

☐ Written exam ☐ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Interim Viva / Work Placement Viva Report	15 mins	30%

Where students have completed a work placement, component 1 will be a report reflecting on the work placement and the experience gained through it.

Assessment Component 2

☐ Written exam ☐ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Final Project Viva	12 minutes	20%

Assessment Component 3

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Written Project report / A3	2500 words	50%

ALTERNATIVE ASSESSMENT

☐ **Written exam**

 ☒ **Coursework**

 ☐ **Practical**

Mode of assessment	Volume	Weighting
Reflective report	5,000 words	100%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	50%
Practical	50%
TOTAL	100%

AHEP3 Version 3 outcomes to be met:

D6, EL1, EL3b, P1, P4, P11b, G1, G2, G3b, G4

INDICATIVE READING LIST

Module Code	ACMA5009	
Module Title	Group Project	
Classification	Reading List entry	Electronic*
Essential	Maylor, H., Project Management 4th Edition (FT Prentice Hall, 2010)	☐
Further	Seppala, N., Business Ethics and Corporate Social Responsibility (Cengage Learning, 2010)	☐
Further	Masterman, G., Sponsorship – for a Return on Investment Butterworth (Heinemann, 2007)	☐

MODULE CODE: M5X01280
TITLE: Modelling Logistic Operations
DATED: 27/08/2014
LEVEL: 5
CREDITS: 20
JACS CODE: N530

AIM(S)

To develop the use and understanding of modelling logistic operations using a range of quantitative and statistical techniques.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to demonstrate the ability to:

1. Critically evaluate the rationale and purpose of models.
2. Demonstrate an ability to develop, design and use a model, specifying data gathering requirements and evaluating limitations.

INDICATIVE CONTENT

- **Theory:** The relationship between a model and data: processes occurring in the real world, theory guided abstraction, data gathering - structural correspondence between the model and the data.
- **Practice:** The development of structural processes; distinguishing basic relationships and defining boundaries, determining variables and understanding forms of measurement.
- **Types of Model:** Inventory and facility location models, stated preference models, simulation models

LEARNING AND TEACHING STRATEGY

Individual topics will be introduced by a weekly lecture of two hours. Lectures will be supported by self exercises and/or directed study. Seminars, group discussions and workshops will be used to develop ideas, concepts and practical applications. Workshops will also involve the use of computers utilising spreadsheet, database and statistical software.

Allocation of teaching hours to deliver the module are:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Summative:

Assessment Component 1 – 50%

The assessment will be in the form of an essay that critically evaluates the role of modelling and analysis techniques in the development of solutions to logistical and supply chain management problems (2,250 words +/- 10%)

Exemplar

Critically evaluate the following statement: A model is a mirror of the real world.

(Essay: word count 2,250 words (+/- 10%).

Assessment Component 2 – 50%

The assessment will be on the form of a report detailing the planning, creation and operation of a small scale computer model addressing an aspect of supply chain modelling agreed with the tutor (wordcount 2,250 words +/- 10%).

Assessment Summary

Activity type	Percentage
Written	0%
Coursework	100%
Practical	
TOTAL	100%

EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)

Does the module contribute to ESD?	Yes
	No
If yes please provide brief details (no more than 100 words):	

BIBLIOGRAPHY

Essential:

Sussams JE, (1992), Logistics modelling, London: Pitman

Shapiro JF, (2007) Modelling the supply chain, Thomson Brooks/Cole

Recommended:

Field A, (2009), Discovering statistics using SPSS: (and sex, drugs and rock 'n' roll), London: SAGE

Background:

De Dios Ortúzar, J (1992) Simplified transport demand modelling: a compilation of major papers selected from PTRC 's summer annual meetings and courses 1984-1989, London: PTRC 1992

Journals:

Journal of Transport Economics and Policy
Transportation
Transportation Research

Websites:

<http://www.statistics.gov.uk/hub/index.html>
<http://www.ons.gov.uk/ons/index.html>

MODULE CODE: M5X01282
TITLE: Research Methods
DATED: 01/04/2014

LEVEL: 5
CREDITS: 20

JACS CODE: J960

AIM(S)

- To further develop the student's ability to apply research methods and statistical techniques to problem solving within the logistics industries.
- To enable the student to apply both qualitative and quantitative methods to problem solving.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

1. Apply research methods and statistical techniques to solving problems within logistics management demonstrating an ability to use statistical and forecasting techniques and methods.
2. Demonstrate a critical understanding of a range of survey techniques and questionnaire design, including knowledge of coding, data entry and analysis.

INDICATIVE CONTENT

- **Analysis:** Use of probability distributions; Forecasting techniques: regression and time series analysis; Review of current industry related forecasts. Organising, recording and analysing data
- **Methods and analytic procedures:** Survey design: sampling, intercept, postal, interview and experimental; group discussions and interviews, ethnography, observation, texts, audio, transcripts, video, field notes, tabulation and coding,
- **Computer Assisted/Aided Qualitative Data Analysis Software (CAQDAS):** Use of statistical software such as SPSS.
- **Presentation:** Conducting a review of literature; referencing and use of secondary data, presentation of results and the formulation of conclusions.

LEARNING AND TEACHING STRATEGY

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

(Tick one)

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Report	1,500 words	30%

Assessment Component 2

(Tick one)

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Written report	3,000 words	70%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	100%
Practical	0%
TOTAL	100%

READING LIST

Module Code	M5X01282	
Module Title	Research Methods	
Classification	Reading List entry	Electronic*
Essential	Creswell J.W. and Creswell J.D., (2018), Research Design: Qualitative, Quantitative, and Mixed Methods Approached, 5 th Edition, SAGE Publications.	☒
Essential	Cottrell S, (2014), Dissertations and project reports: a step by step guide, Basingstoke: Palgrave Macmillan	☐
Essential	Field A, (2009), Discovering statistics using SPSS: (and sex, drugs and rock 'n' roll), London:SAGE	☐
Further	Mason J, (2002), Qualitative researching 2 nd Edition, London: SAGE	☐
Further	Robson C, (2011), Real world research: a resource for users of social research methods in applied settings, Wiley, Chichester	☐
Further	Yin RK, (2009), Case study research: design and methods London: SAGE	☐
Further	European conference on research methodology for business and management studies International journal of social research methodology	☒

MODULE CODE: M5X01283
TITLE: Finance and Economics
DATED: 27/08/2014
LEVEL: 5
CREDITS: 20
JACS CODE: L110

AIM(S)

- To develop an appreciation and understanding of the significance of financial management within a business organisation.
- To apply the general principles of economics to specific issues relating to logistic systems.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to demonstrate the ability to:

1. Demonstrate an understanding of financial and management accounting related to the logistics industries.
2. Evaluate the application of economic theory to provide solutions to issues relating to consumer behaviour and the logistics industries.

INDICATIVE CONTENT

- **Accounting:** Fundamental accounting concepts and their applications including the preparation and use of the main financial statements. Identification and use of financial ratios and cash flow forecasting. Capital investment appraisal, cost benefit analysis and costing in logistics operations. Practical decision making with respect to costing and pricing.
- **Economics:** The stock market, sources of finance and taxation; the behaviour of consumers and organisations; interpretation of graphical and numeric data. Implications of wider economic issues and government policies in the logistics industries. Multi-Criteria Decision Analysis.

LEARNING AND TEACHING STRATEGY

Individual topics will be introduced by a weekly lecture of two hours. Lectures will be supported by self-assessment exercises and/or directed study. Seminars, group discussions and workshops.

Allocation of teaching to deliver the module are:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Formative:

Group workshop

Using Chapter Six of 'Multi-criteria analysis: a manual' (search 'mca manual' will take you to www.gov.uk and the manual should be the first result), conduct an analysis on the selected four-slot toasters.

Summative:

Assessment Component 1 – 50%

The assessment will be in the form of a 2 hour written examination containing a series of financial and management accounting problems which the student is expected to calculate and solve.

Assessment Component 2 – 50%

The assessment will be in the form of a report that evaluates the application of appropriate aspects of economic theory as a means of determining solutions to consumer-related management problems. (2,250 words +/- 10%)

Exemplar

- Explain the principles of MCDA.
- Discuss and explain how the group worked through the MCDA stages in evaluating the toasters.
- Present the results of the MCDA in tabular and graphical format (benefits vs. costs)
- Undertake sensitivity analysis.
- Describe an appropriate motorsport/transport/logistics scenario to which MCDA could be applied and identify the likely stakeholders of such a project.

(Report 2,250 words +/-10%)

Assessment Summary

Activity type	Percentage
Written	50%
Coursework	50%
Practical	0%
TOTAL	100%

EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)

Does the module contribute to ESD?	Yes
	No
If yes please provide brief details (no more than 100 words):	

BIBLIOGRAPHY

Essential:

Jones M (2006) Accounting 2nd Edition, Chichester: Wiley

Lipsey RG, (2007), Economics, Oxford: OUP

Background:

Button, K. (2010), Transport economics, Cheltenham: Edward Elgar,

Jones M, (2002), Accounting for non-specialists, Chichester: Wiley,

Hanley N et al, (2013), Introduction to environmental economics, Oxford: OUP

Journals:

The British Accounting Review

Journal of Transport Economics and Policy

Websites:

MODULE CODE:	M5X01285
TITLE:	Social Trends and Consumerism
DATED:	27/08/2014
LEVEL:	5
CREDITS:	20
JACS CODE:	L990

AIM(S)

- To provide students with an understanding and appreciation of changes to social trends since the beginning of the 20th Century
- To consider the importance of consumer trends and behaviour in the development of logistic strategies.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to demonstrate the ability to:

1. Demonstrate a critical understanding of the development of social trends since the beginning of the 20th Century.
2. Demonstrate a critical understanding of the impact of consumerism on the development of logistic services in support of the retail industry

INDICATIVE CONTENT

- **Trends:** The market environment: competition, demographics, cultural forces; analysis of consumer needs and behaviour. Branding. Knowledge economy; Rise of the Middle Classes; impact of a global economy, the internet and communications technologies
- **Distribution policy:** channels of distribution; factors affecting choice of channel(s) and customer service levels.
- **Sustainability:** Marketing strategies; Carbon Footprint; Demographical influences; eTailing

LEARNING AND TEACHING STRATEGY

Individual topics will be introduced by a weekly lecture of two hours. Lectures will be supported by self-assessment exercises and/or directed study. Seminars, group discussions and workshops will be used to understand the role and importance of marketing in a logistics context

Allocation of teaching hours to deliver the module are:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Summative:

Assessment Component 1 – 50%

The assessment will be in the form of a report evaluating trends in consumerism (word count 2,250 words +/-10%)

Exemplar – HND/BSc Logistics and Food Logistics

Critically appraise how the increased development of internet-based home shopping has affected logistical services.

(Report 2,250 words +/-10%)

Exemplar – HND/BSc Motorsport Logistics

Critically appraise how the rising median age of motorsport fans may affect the industry in the future.

(Report 2,250 words +/-10%)

Assessment Component 2 – 50%

The assessment will be in the form of a report evaluating the impact of changes to consumer behaviours affecting the logistics services industries. (word count 2,250 words +/-10%)

Exemplar – HND/BSc Logistics, Food and Motorsport Logistics

Critically appraise how the increased development of internet-based home shopping has affected logistical services.

(Report 2,250 words +/-10%)

Assessment Summary

Activity type	Percentage
Written	0%
Coursework	100%
Practical	0%
TOTAL	100%

EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)

Does the module contribute to ESD?	Yes
	No
If yes please provide brief details (no more than 100 words): The strategic importance of issues related to sustainability is addressed insofar as it influences consumer behaviour though it is not a major aspect of this module.	

READING LIST

Essential:

Solomon MR et al, (2013), Consumer Behaviour: A European Perspective 5th Edition, Harlow: Pearson Educational

Stephens D, (2013) The Retail Revival: Reimagining Business for the New Age of Consumerism, Canada: Wiley

Background:

Jansson-Boyd CV, (2010), Consumer psychology, Maidenhead: McGraw-Hill/OUP

Klein N, (2010), No Logo 10th Edition, London: Penguin

Klein N, (2008), The Shock Doctrine: The Rise of Disaster Capitalism, London: Penguin,

Stearns PN, (2006), Consumerism in World History: The Global Transformation of Desire (Themes in World History), Abingdon: Routledge

Schiffman LG et al (2006), Consumer Behaviour: A European Outlook 2nd Edition, Harlow: Pearson Education

Journals:

Chartered Institute of Purchasing and Supply: Supply Management

Websites:

American Marketing Association: <http://www.marketingpower.com/>

Business Link: <http://www.businesslink.gov.uk/>

Direct Marketing Association: <http://www.the-dma.org/>

Guerrilla Marketing: <http://www.gmarketing.com/>