Date: 12-05-2021

BEng (Hons) Agricultural Engineering

UCAS code	H330
Institution code	H12
Duration	4 years (full-time) including a one-year work placement. A three year programme is available for applicants with at least two years, full-time relevant work experience.
Start date	September 2021
Accredited by	Institution of Agricultural Engineers (IAgrE)
Location	Harper Adams University campus (and location of work placement)*

The course

This course has a mechanical engineering core with a specialism in the design and development of agricultural machinery and systems. The courses cover everything from the principles of the design of agricultural machines, soil/implement interaction and irrigation and drainage, through to advancing technologies in the fields of precision farming, agricultural robotics and renewable energy.

You will cover not just theory and technical skills but the research and business techniques needed by professional engineers. Industry figures have helped us to develop a comprehensive curriculum combining core engineering subjects with the latest industrial techniques. Much of our teaching is project led, and is designed to develop the professional skills that you will use as a graduate engineer.

Duration

4 years (full-time) including a one-year work placement. A three year programme is available for applicants with at least two years, full-time relevant work experience. Please contact Admissions for further information on this option.

A-level entry requirements

- Offers tend to be in the region of **96 - 120** UCAS points
- A2 level grades **CCC - BBB**
- Students should typically be studying **3 subjects at A2 level** to be considered
- The following subjects are preferred; Mathematics, Physics, Biology, Chemistry, Further Mathematics, Design Technology
- General Studies and Critical Thinking are encouraged but **not** included in grades required
- **4 GCSEs at grade C/4 or above**, including English Language, Maths and a Science
- Applicants can expect to receive offers including specific grades in specific subjects (for example, a B or C at A level, or an M or D for BTEC modules)
- Key Skills (and other level 2 variants) and First Certificates/Diplomas are not accepted in place of GCSE passes
- Overseas applicants please check our English Language Requirements
- All suitable applicants are expected to attend an interview which will form part of the selection

process

- Applications from **Access to HE Programmes** are welcomed, and will be considered on an individual basis. The most relevant access courses are **Access to Science** and **Access to Engineering**.
- Applications are welcomed from students who do not meet the minimum entry requirements but who can demonstrate sufficient academic ability and motivation via their application and during interview.
- We have developed a range of measures and initiatives to give everyone the best chance to access our undergraduate degree programmes. The main feature of **Access to Harper** is our contextualised offer scheme. A contextualised offer is an offer which is reduced, by one grade or more from the standard entry requirement and is made to those applicants who may have experienced personal circumstances which put them at a disadvantage during their education, such as attending a low achieving school, living in an area of low participation in Higher Education or being a Care Leaver. The aim of this is to make the University more accessible for those applicants who may not have previously thought that they were eligible to apply. We have also introduced reduced entry requirements for those applicants who are over 21 years of age and further initiatives to make the application process easier for those applicants who need it.

  To check if you qualify please visit the Access to Harper page.

Note: Entry Requirements are for guidance only, please check the UCAS website or contact Admissions for further information.

Work placement

Our students spend their year-long placement working as professional engineers with an industrial firm such as John Deere, CNH, Great Plains, Claas or AGCO. You will be helped to find the right role by an engineering placement manager based at Harper Adams.

Accreditation

This course is accredited by the Institution of Agricultural Engineers (IAgrE) on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for registration as a Chartered Engineer.

Teaching and learning

Your first year will focus on core engineering theory, including design skills, engineering mechanics, maths, and materials. Alongside these generic engineering topics, you will also start to learn the fundamental basis for your area of specialism - whether that be Off Road Vehicle Design or Agricultural Engineering.

This theoretical content is complemented by a range of free practical skills training in areas such as welding, milling, turning and off highway vehicle operation. This mixture of theoretical and practical skills and knowledge is designed to give you the foundation for your development into a professional engineer.

In the second year you will begin to apply this learning to solving real-life engineering problems. Here you will take part in a design-and-build project that you will also test and evaluate – just as you would as a working engineer.

The industrial work placement undertaken by all students is a central element of your development as a professional engineer. We will help you to find a placement within an organization that closely matches your interests and aspirations. The placement year gives you an opportunity to act in a professional capacity inside a real functioning company. You will spend this year using and developing the skills from the first two years of your course within the context of a commercial organisation.

Your development into an industry ready professional engineer will be further enhanced after placement,

where you will complete individual industry/research projects as well as group projects. These will involve delivering solutions to real problems for external clients, to whom you will present your findings, and who will help to mark your projects.

* During the Covid-19 Pandemic the University is delivering blended learning. Government guidance is being constantly reviewed to establish the learning events which can be delivered face to face. Please refer to our frequently asked questions for further details.

Careers

Careers opportunities in this field are excellent. Our Agricultural Engineering graduates are employed as professional engineers in: design and development, new product testing, manufacturing and equipment production, managerial and leadership roles.

What will I study?

	Study time (The percentage of time spent in different learning activities)			Assessment methods (This is the breakdown of assessment methods)		
Year	**% time in lectures, seminars and similar**	**% time in independent study**	**% time on placement**	**Written exams**	**Practical exams**	**Coursework**
1	**32%**	**68%**	**0%**	**57%**	**23%**	**20%**
2	**27%**	**73%**	**0%**	**31%**	**31%**	**38%**
3	**0%**	**0%**	**100%**	**0%**	**0%**	**100%**
4	**17%**	**83%**	**0%**	**0%**	**6%**	**94%**

Year 1		Year 2		Year 3	Year 4	
Communication for Engineers (E4002C17)	15	Fundamentals of Agricultural Engineering (E5014C17)	15	Placement year	Honours Engineering Project (E6007C17)	15
Mathematical Tools and Techniques for Engineers (E4008C17)	15	Global Agricultural Production (E5015C17)	15		Agricultural Machinery Design (E6004C17)	15
Problem Solving (E4009C17)	15	Engineering Design (E5006C17)	15		Advanced Stress Analysis (Industry Based) (E6003C17)	15
Fundamentals of Mechanical Science: Dynamics (E4005C17)	15	Applied Mechanical Science - Materials Under Load (E5007C17)	15		Strategic Management (R6021C17)	15
Fundamentals of Mechanical Science - Materials Under Load (E4006C17)	15	Applied Mechanical Science - Dynamics and Control (E5008C17)	15		Group Engineering Project (E6006C17)	15
Materials and Materials Processing (E4007C17)	15	Manufacturing and Operations Management (E5009C17)	15		**Options**	
Fundamentals of Measurement (E4004C17)	15	Experimental Design and Analysis (E5010C17)	15		Power Systems (E6011C17)	15
Fundamentals of Actuation (E4003C17)	15	Electronic Control Systems (E5011C17)	15		Competitive Production Management (E6001C17)	15
					Mechatronics Design and Control (E6010C17)	15

Communication for Engineers

Year of study 1
Code E4002C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

Engineering is normally considered to be a highly specific technical field of study. However, the applications of engineering cover a vast spectrum of employment fields, industrial sectors, and hierarchical positions. This broad area also applies within a company, corporation, nationally and internationally. Throughout the breadth of engineering disciplines, the engineers communicate using internationally standardised methods, practices, behaviours and techniques. In order to function the engineer must adopt these standards.

These internationally recognised forms and standards of communication allow the professional engineer to successfully collaborate with all engineering professionals worldwide. This module is the first step on the professional practice stream, which is designed to develop knowledge and understanding of the standardised practices and behaviours of the professional engineer. The learning, knowledge and understanding developed in this module will also enable you to complete engineering assignments in the correct manner and to ensure success during industrial placement and future employment.

This module is not in itself designed to teach technical aspects of engineering, but will enable you to understand the language of engineers and to communicate within the world of engineering. The module will provide engineering standard reference material and encourage the development of engineering behaviours.

Mathematical Tools and Techniques for Engineers

Year of study 1
Code E4008C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

Mathematics is fundamental to engineering. The purpose of this module is to provide you with the mathematical skills and techniques necessary to solve engineering problems.

In order to progress, you will have successfully applied the quantitative problem solving skills developed in this module to solve given problems within parallel modules.

Successful completion of this module will provide a robust foundation for you to engage with the engineering specific mathematical calculations and analyses which form a significant part of subsequent learning.

You will:

- Select and apply mathematical techniques to solve mathematical problems.
- Solve a given engineering problem using appropriate mathematical techniques.

Problem Solving

Year of study 1
Code E4009C17
Credits 15
Core/option Core
Module contact Mr Graham Higginson

The primary role of an engineer is to solve problems. In order to be effective an engineer needs to be able to select and apply knowledge gained across the spectrum of engineering disciplines.

This module leads the first phase of the learning programme in which you will develop the discipline to use a structured approach in engineering.

In order to progress, you will be able to use industry standard methodologies to deliver a solution. This learning will be applied across subsequent modules and will form the basis of your development in to an effective engineer

You will:

- Define a given problem with consideration for constraints, needs and options.
- Use industry standard methodologies to identify root cause for given problems.
- Use a structured approach to solution selection and implementation.

Fundamentals of Mechanical Science: Dynamics

Year of study 1
Code E4005C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

The ability to recognise the behaviour of mechanisms in motion is fundamental to any engineer working

with mechanical systems.

This module provides the theoretical knowledge of the science behind the performance and behaviour of dynamic systems in engineering. In order to progress, the student needs to understand the fundamental principles contained within this module.

As well as understanding core concepts, such as Newton's laws, friction and vibrations and relating them to key applications, at the end of the module students should be able to understand a range of mechanisms that provide movement and demonstrate where they would be used in real machines of all varieties.

This module is delivered in conjunction with the complementary modules Fundamentals of Actuation and Fundamentals of Mechanical Science - Materials Under Load, which provides the knowledge of the principles in the application of force to generate or control movement in mechanisms and load applied to static structures.

Fundamentals of Mechanical Science - Materials Under Load

Year of study 1
Code E4006C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

The ability to recognise the performance of structures when subjected to different loading conditions is fundamental to any engineer working with mechanical systems.

This module introduces the fundamental principles of static engineering and develops core techniques and methods use to investigate structural engineering problems.

In order to progress, you will need to understand the fundamental principles contained within this module. This module is delivered in conjunction with the complementary module **Fundamentals of Mechanical Science - Dynamics**, which provides the knowledge of the principles and behaviour of dynamic systems in engineering.

Successful completion of this module will enable you to recognise the structural behaviour of a given engineering system. This learning will be applied across subsequent modules, and for students progressing on the MEng or BEng routes further application will be specifically developed in the **Applied Mechanical Science - Materials Under Load** module.

You will:

- Explain the fundamental principles and concepts in the area of solid mechanics (statics).
- Solve a range of problems involving forces, moments, torsion and stress/strain using underlying principles.
- Examine the stress/strain outcomes in relation to given applied example.

Materials and Materials Processing

Year of study 1
Code E4007C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

The ability to select an appropriate material is fundamental to any engineer working with mechanical systems.

This module aims to provide an introduction to the science, behaviour and properties of commonly used engineering materials, and the effect of processing on material performance.

Successful completion of this module will enable the student to select an appropriate material for a specific product application. This learning will be applied across subsequent modules, and students who choose to progress on the Mechanical Engineering route will have the opportunity to further develop their knowledge in this subject in the Engineering for Manufacture module, and specialist module Advanced Materials.

You will:

- Differentiate between commonly used engineering materials through an understanding of their properties.
- Distinguish between processing methods for different material families.
- Select and justify an appropriate material for a given application.

Fundamentals of Measurement

Year of study 1
Code E4004C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

The ability to measure and to utilise measurement data is fundamental to any engineer.

This module develops core skills, techniques and methods, as well as learning the fundamental principles in the field of measurement and valid data collection.

In order to progress, you need to understand the fundamental principles contained within this module and the selection and operation of standard measurement equipment.

Successful completion of this module will enable you to select and operate standard measurement equipment and understand the scope, limitations and constraints of the technology within a given scenario.

This learning will be applied across subsequent modules and further application will be developed in the **Experimental Design and Analysis** module in year 2.

You will:

- Identify dependant, independent and confounding variables for a given measurement scenario.
- Select, develop and deploy measurements to turn customer needs into engineering specifications.
- Select appropriate measurement equipment for a given scenario and deploy correctly.

Fundamentals of Actuation

Year of study 1
Code E4003C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

The ability to understand the generation and control of forces and motion is a fundamental requirement for any engineer working with dynamic mechanical systems.

This module introduces the components and systems utilised in the application of force in mechanical systems, and applies the theoretical knowledge of the science behind force and motion in dynamic systems.

This module is delivered in conjunction with parallel module **Fundamentals of Mechanical Science - Dynamics**, which provides the theoretical knowledge of the science behind the performance and behaviour of dynamic systems in engineering.

You will:

- Describe how forces can be transferred effectively onto mechanical components using a variety of actuation methods.
- Identify suitable actuators for mechanical tasks given limitations with respect to force, torque, current, voltage, pressure and velocity.
- Select the components required to satisfy the functional performance needs for a given actuation system.

Fundamentals of Agricultural Engineering

Year of study 2
Code E5014C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

The ability to apply knowledge of engineering theory in the selection and specification of agricultural machinery and infrastructure subsystems are fundamental to any engineer working in the agricultural engineering industry.

This module introduces the engineering system elements and underpinning engineering theory for contemporary agricultural machinery and infrastructure.

This module is delivered in conjunction with parallel module Global Agricultural Production, which provides the knowledge of the agricultural environment, contemporary processes and primary activities for crop and animal production.

You will:

- Identify and explain the operation engineering sub-system elements of contemporary agricultural machinery and infrastructure.
- Select appropriate tests, analyse and evaluate the primary subsystems for a given agricultural machine or infrastructure scenario.
- Apply engineering theory in the selection and specification of subsystems of agricultural machinery and infrastructure to solve a given scenario.

Global Agricultural Production

Year of study 2
Code E5015C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

The ability to utilise knowledge of contemporary engineering solutions and agricultural production practice are fundamental to any engineer working in the agricultural engineering industry.

This module introduces the agricultural environment, contemporary processes, primary activities for crop, animal production and associated agricultural engineering solutions.

This module is delivered in parallel with module Fundamentals of Agricultural Engineering, which provides the theoretical knowledge of contemporary agricultural engineering solutions.

You will:

- Propose an appropriate agricultural system for a given environmental and natural resource scenario.
- Explain the contemporary processes and primary activities for crop and animal production.
- Apply contemporary engineering solutions and agricultural production practice to propose a conceptual solution to a given agricultural scenario.

Engineering Design

Year of study 2
Code E5006C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

This module, which leads on from the Problem Solving module studied in Year 1, aims to further develop your systematic approach to problem solving through application of the engineering design process. The Engineering Design module draws on prior and concurrent learning to develop solutions to engineering problems, and is seen as an integrating module as well as a core part of the learning process - with the skills and procedures developed within this module used throughout the course. The module also aims to develop your ability to make use of appropriate computer design and simulation software. This module will be focused around a contextualised group based design, production and evaluation activity.

You will:

- Work in a team and apply an appropriate structured design methodology to create a product solution that satisfies the stated customer needs.
- Produce a functional prototype of the chosen final design.
- Produce a test plan to assess finished product performance against specification, then conduct the tests and report the findings of the completed tests.

Applied Mechanical Science - Materials Under Load

Year of study 2
Code E5007C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

The ability to recognise the performance of structures when subjected to different loading conditions is fundamental to any engineer working with mechanical systems.

This module develops the knowledge of mechanical science theory and enhances the understanding through application of the theory to mechanical and structural engineering problems. This ability allows for more realistic modelling to bring the theoretical calculations much closer to those expected in practice.

Successful completion of this module will enable you to define the structural behaviour of a given mechanical system. This learning will be applied across subsequent modules, including the **Advanced Stress Analysis (Industry Based)** module.

You will:

- Explain further knowledge of static loading and theories of failure.
- Apply knowledge of static loading systems and interpret quantitative data to evaluate a given problem.
- Solve a complex problem through the application of appropriate theories relating to the structural behaviour of a given mechanical system and provide a justified solution.

Applied Mechanical Science - Dynamics and Control

Year of study 2
Code E5008C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

The ability to predict the behaviour of dynamic systems is fundamental to engineers working with mechanical systems.

This module develops the knowledge of the science behind the performance and behaviour of dynamic systems and enhances the understanding through application of the theory to mechanical and dynamic engineering problems. This ability allows for more realistic modelling of real world factors to bring the theoretical calculations much closer to those expected in practice.

Successful completion of this module will enable you to define the dynamic behaviour of a given mechanical system.

You will:

- Express mathematically and solve multi-degree of freedom dynamic mechanical systems which have compliant and damping elements.
- Use control theory to analyse the response of dynamic control systems.
- Model dynamic control systems to achieve a desired outcome.

Manufacturing and Operations Management

Year of study 2
Code E5009C17
Credits 15
Core/option Core
Module contact Mr Graham Higginson

The manufacturing of products and how those products are manufactured is of fundamental importance to any Engineering business. It is important for the engineer to understand how product manufacture is optimised to minimise cost and maximise customer satisfaction whether employed in a new product development role, production role, or customer-facing role.

This module is an introduction to the management of operations management and will introduce students to the systems approach to the management and organisation of manufacturing environments. This module, through liberal use of case studies, will provide an understanding of systems strategies in manufacturing. An emphasis will be placed on the relationship between, and the integration of, a range of techniques and their application to well-known problems in the design and operation of manufacturing activities. During this module students will:

- Explain the purpose of a number of industry tools and techniques, and be able to select appropriate tools for a given scenario.
- Assess the effectiveness and efficiency of given operational processes using relevant tools and techniques.
- Propose, implement and evaluate an appropriate plan for the improvement of given manufacturing process.

Experimental Design and Analysis

Year of study 2
Code E5010C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

The ability to plan and conduct a validation activity (experiment, test or trial) is a fundamental capability of any engineer, and will enable them to assess risk or determine confidence in a novel solution. This module develops from the core measurement skills, techniques and methods gained in Fundamentals of Measurement and utilises analytical skills learnt in Mathematical Tools and Techniques for Engineers.

In order to progress, you will need to understand the influencing factors affecting experimental design planning and the importance of appropriate selection of equipment, methods and resources.

Successful completion of this module will enable you to plan, conduct, analyse and evaluate an experiment to answer a given research question.

You will:

- Collect and process raw data and assess its fidelity.
- Select and apply appropriate analysis tools to evaluate a given data set.
- Design and plan an experiment to test a given hypothesis.

Electronic Control Systems

Year of study 2
Code E5011C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

Electronic control of complex mechanical systems is commonplace. The ability to incorporate electronic control systems into complex mechanical solutions is fundamental to any engineer.

This module develops the applied knowledge of electronic systems gained from Fundamentals of Actuation to the control of actuating mechanisms.

Successful completion of this module will enable you to develop, produce and evaluate a control system.

You will:

- Select system components and integrate them into a functioning system.
- Produce a method of controlling a system to achieve a given task.
- Devise, produce, test and evaluate a control system for a given mechanism to achieve a set task.

Placement year

Year of study 3
Core/option Core

Read our dedicated Placement Learning pages for information on the many benefits of the placement year.

Honours Engineering Project

Year of study 4
Code E6007C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

The ability to resolve complex problems is a fundamental capability of a professional engineer. Fundamental elements of this capability include: being able to define a problem; being able to select and correctly apply relevant tools, techniques, methods and practices in the resolution of the problem; and the ability to critically evaluate the effectivity of the applied process.

Successful completion of the Honours Engineering Project will demonstrate your motivation, resilience, and abilities to select and apply appropriate methodologies in the resolution of an engineering problem selected from your chosen field of specialisation. The Honours Engineering Project functionally assesses in a holistic way your ability to engage with and deliver a successful body of work and as such forms the capstone activity for the curriculum.

You will be expected to ensure that your project is ethically sound; this will require you to follow appropriate protocols and also to demonstrate an ethical mind-set which is sensitive to stakeholders and issues arising in the process. You must also ensure that you attend to issues of health and safety throughout your project.

Agricultural Machinery Design

Year of study 4
Code E6004C17
Credits 15
Core/option Core
Module contact David White

The ability to develop appropriate solutions through synthesis of agricultural engineering theory and knowledge of contemporary agricultural production processes, is fundamental to any engineer working in

the agricultural engineering industry.

In this module, you will be presented with scenario(s) to demonstrate phronesis and synthesis through the correct application of appropriate knowledge and methodologies to solve complex agricultural engineering problems.

You will:

- Produce a problem definition and an engineering design brief for a given agricultural scenario.
- Produce a product design specification for the given agricultural scenario.
- Utilise engineering theory and design practice to produce a viable solution to the given agricultural scenario.

Advanced Stress Analysis (Industry Based)

Year of study 4
Code E6003C17
Credits 15
Core/option Core
Module contact Dr Ian Moorcroft

This module assesses, at a higher level, the capability of the student engineer to integrate and apply prior learning from the modules: Applied Mechanical Science – Materials Under Load; Applied Dynamics and Control; Experimental Design and Analysis; and Electronic Control Systems.

Prior learning in this programme provides you with knowledge, tools, techniques and methods to solve a range of static and dynamic problems. In this module, you will identify additional areas for learning and demonstrate phronesis and synthesis through the correct application of appropriate knowledge and methodologies to solve complex mechanical problems.

On successful completion of this module, you will be able to apply professional engineering practice to the evaluation of commercially produced complex mechanical systems.

You will:

- Conduct an effective review of literature in areas of theoretical analysis and potential failure modes relevant to a given product;
- Explain and demonstrate the limitations in applying theoretical structural analysis to combined loadings in a commercially produced complex mechanical system;
- Synthesise, apply and communicate an appropriate process for the resolution of a given problem based on a commercially produced complex mechanical system.

Strategic Management

Year of study 4
Code R6021C17
Credits 15
Core/option Core
Module contact Mrs Rebecca Payne

A thorough appreciation of the concepts and techniques of Strategic Management is needed by all senior managers in order that they might manage their organisations both efficiently and effectively. This module focuses on the role of company-level strategy and its relationship with the other main business functions. Through extensive use of case study material, it allows students to reflect on practical experience gained during the placement period. By integrating theory and practice from a number of subject areas, students will be able to appreciate the contribution of the various functions within an organisation to the development of an overall strategic direction. The importance of effective implementation is emphasized along with the need for flexible strategies and the proactive management of change. The modules Business Finance or Equivalent Module, Principles of Marketing, Business Organisation and Work Experience (Placement Year) are considered desirable pre-requisites.

Group Engineering Project

Year of study 4
Code E6006C17
Credits 15
Core/option Core
Module contact Mr Greg Rowsell

Engineers are expected to be able to work effectively both independently and as a member of a team in the delivery of solutions to agreed standards and deadlines. Engineers, to be effective, must be able to study a given situation and be able to calculate delivery feasibility against time and resource availability.

It is a normal expectation that engineers are required to resolve complex problems in parallel to other work, and to work effectively with colleagues. You will have gained group work experience in prior modules and during the industrial placement period. The module aims to provide you with the opportunity to demonstrate your capability of working as a project team having joint and several responsibility for the delivery of the project, and to demonstrate, in an applied context: an appropriate depth and breadth of technical knowledge and management capability; professional engineering behaviours; and an understanding of project delivery risks.

Each group of students' project is generally sourced from companies within the engineering industry. These projects are technical and commercial in nature. Companies provide background information, details of the problem, and some references for the team at the outset. If there are any other requirements, in addition to the agreed deliverables, these will also be made clear at the start of the project.

Power Systems

Year of study 4
Code E6011C17
Credits 15
Core/option Option
Module contact Mr David Clare

This module explores the methods by which vehicles and mobile machinery generate and transmit power, and will provide you with a detailed background knowledge of power generation and transmission systems sufficient for you to specify and select such systems. This module is intended to prepare you for systems engineering roles within mobile machinery or vehicle Original Equipment Manufacturers (OEMs).

You will:

- Specify and select power generation and transmission systems for a range of mobile machinery and vehicles.
- Evaluate a range of power transmission systems and make recommendations for methods for optimising the performance and behaviour of such systems.
- Simulate power flow within a mobile machine for a given duty-cycle

Competitive Production Management

Year of study 4
Code E6001C17
Credits 15
Core/option Option
Module contact Mr Greg Rowsell

The manufacturing of products and how those products are manufactured is of fundamental importance to any Engineering business. It is important for the engineer to understand how product manufacture is optimised to minimise cost and maximise customer satisfaction whether employed in a new product development role, production role, or customer-facing role.

This module builds upon the module **Manufacturing and Operations Management**, developing your capabilities with regards to manufacturing engineering management.

Through liberal use of case studies you will develop the ability to synthesise competitive manufacturing management methodologies, and the skills to observe, study and assess the efficacy of a manufacturing situation, in order that you are able to plan for manufacturing processes and manage the improvement of existing processes.

You will:

- Assess the effectiveness and efficiency of given organisational processes and production methods.
- Evaluate and apply alternative Quality Assurance methodologies in the manufacturing environment
- Propose, implement and evaluate an appropriate plan for the improvement of given manufacturing process.

Mechatronics Design and Control

Year of study 4
Code E6010C17
Credits 15
Core/option Option
Module contact Dr Sven Peets

The industrial application of control underpins the development of advanced machinery design. Learning from industry applications and real problems, this module aims to place you in a position to design, develop and implement control systems when designing advanced machinery.

This module builds upon the learning in the pre-requisite module Electronic Control Systems so that you can apply techniques used in commercially applied control systems. Programming and program design methods are further developed to ensure reliable, safe systems which can be presented using standard conventions. The use of sampled data with appropriate processing algorithms will allow far more flexible control systems. Current and future vision and positioning systems are covered, allowing the capability to extend far into the future.

You will:

- Specify and select an appropriate controller, communication protocol and sensors system to control a mechatronic device.
- Develop and optimise an algorithm to control a mechatronic system.
- Identify the considerations when specifying, developing and signing off mechatronic systems.