THE DYSON INSTITUTE

Undergraduate Engineer Handbook

Year three

dyson

v1.0 December 2019

The Dyson Institute
of Engineering and Technology
Type of document

Bachelor Engineering (BEng Hons) Handbook

Year three 2019/20

Status: Current

Version number: 1.0

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Contents

Welcome

Welcome to year three of your Bachelor Engineering (BEng Hons) and Level 6 Product Design and Development Engineering Degree Apprenticeship*.

This document aims to give you clear and succinct information about what to expect, and who to talk to during your academic journey this year.

**You will only be enrolled on the apprenticeship if you are eligible and you should be aware if you are not.*

1.0 Delivery of your degree course: Year three

1.1 Academic teaching will take place over three trimesters:

Your degree course is taught over three trimesters. In year three, two subjects are be covered in each trimester. Warwick staff deliver the degree on site at Dyson.

Trimester 1
Teaching: 30 September 2019 to 5 December 2019
Revision/consultancy: Week of 9 December 2019
Academic leave: 24 December 2019 to 3 January 2020
Exams: 17 and 19 December 2019

Trimester 2
Teaching: 6 January 2020 to 19 March 2020
Academic leave: 20 January 2020 to 24 January 2020
Revision/consultancy: Week of 23 March 2020
Exams: 31 March 2020 and 2 April 2020
Academic leave: 6 April 2020 to 17 April 2020

Trimester 3
Teaching 20 April 2020 to 25 June 2020
Revision/consultancy: Week of 29 June 2020
Exams: 8 and 10 July 2020

Academic leave: 13 July 2020 to 24 July 2020

2.0 Key people

2.1 Academic staff and support:

Your teaching team will deliver your lecturers, set and mark your assignments and offer academic support. You will also find support for your degree apprenticeship programme (if you are enrolled on it). The teaching team and academic support team are listed below:

The University of Warwick: Warwick Manufacturing Group

Academic teaching team

Programme Director: Professor Steve Maggs
Course Lead: Dr Matija Sokola

Tutor: WM352 – Siavash Amin-Nejad
Tutor: WM353 – Neil Richardson
Tutor: WM355 – Farah Villa Lopez
Tutor: WM356 – Mir Syeyedebrahimi
Tutor: WM357 – Matija Sokola
Tutor: WM359 – Muhammad Khan
Tutor: WM360 – Zeina Rihawi
Tutor: WM361 – Jianhua Yang
Tutor: WM362 – Mir Seyedebrahimi
Tutor: WM363 – Paolo Villella
Tutor: WM365 – Jane Rayner
Tutor: WM367 – Rafael Crespo
Tutor: WM368 – Jane Rayner

Workplace and academic support

Programme Director/UK Technical Director: Matt Wilson (cohort one (year three) contact)
Programme Lead/Technical Manager: Bob Tricklebank (cohort two (year two) contact)
Academic Support/Senior Technical Engineer: Ned Carpenter (cohort three (year one) contact)
Academic Support/Workplace Tutor/Technical Engineer: Ben FitzPatrick (cohort three (year one) contact)

Apprenticeship support

Apprenticeship Tutor Hugh Reynolds

2.2 Professional Services Academic Support

Your professional services support team provide the non-academic services that support the delivery of your course.

Robyn Skelton	Regulatory and Compliance Manager
Ruth Burchell	Academic Quality and Standards Officer

If you are experiencing difficulty relating to your non-academic experience or wellbeing you can speak to your Student Support Advisor.

2.3 Peer support

You have Student Representatives (Reps) who work in partnership with the academic team to improve the degree course and apprenticeship. Your Academic and Workplace Reps are part of a Student Staff Learning Committee (SSLC) which is part of The University quality and standards structure.

The Academic Reps should meet with their cohort on a frequent basis to track queries and actions. They meet with the academic team regularly and provide a collective student voice to help shape the programme. You can use your Reps to forward your feedback to be discussed in these meetings.

The Academic and Workplace Reps sit on The Dyson Institute Undergraduate Experience Committee who work with The Institute in partnership on projects, collating and voicing student feedback and suggest ideas to improve how The Institute works.

3.0 Degree course structure: Year three

3.1 Overall structure

Your programme has been created through a partnership between Dyson Technology and The University of Warwick to give you the best opportunity to gain a robust academic course paired with experience of working in a leading global brand.

This partnership continues to function to enhance the programme in response student and staff feedback with the intention of making it responsive and flexible, to ensure it meets the continued needs of students and Dyson.

In the first two years you will study a general engineering syllabus, giving you a strong technical foundation across multiple disciplines. In years three and four, you'll specialise in mechanical engineering, electronics, software, or electromechanical engineering. We will guide you through the potential specialisation pathways to find the route best suited to you.

Alongside theoretical knowledge, you will develop applied skills, such as design, prototyping, PCB layout and computer aided design (CAD). You'll be working in a global business, playing a vital role in the development of future technology.

3.2 Year three

In year three of your degree you will take the six modules in your chosen stream listed in the table below. They have been designed to enable you to specialise in your chosen area of study.

Mechanical stream	
Trimester 1 **WM359**	Manufacturing and Metrology
Trimester 1 **WM368**	Advanced Thermodynamics
Trimester 2 **WM365**	Acoustics
Trimester 2 **WM367**	Vibration and Rotordynamics
Trimester 3 **WM363**	Systems Modelling and Control
Trimester 3 **WM360**	Signal Processing
Electromechanical stream	
Trimester 1 **WM356**	Embedded Systems
Trimester 1 **WM352**	Analogue Systems
Trimester 2 **WM361**	Software Development for Engineers
Trimester 2 **WM367**	Vibration and Rotordynamics
Trimester 3 **WM363**	Systems Modelling and Control
Trimester 3 **WM360**	Signal Processing
Electronic Hardware stream	
Trimester 1 **WM356**	Embedded Systems
Trimester 1 **WM352**	Analogue Systems
Trimester 2 **WM355**	Electronics Manufacturing and Assembly
Trimester 2 **WM357**	Energy Storage Systems
Trimester 3 **WM363**	Systems Modelling and Control
Trimester 3 **WM360**	Signal Processing

Electronic Software stream	
Trimester 1 WM356	Embedded Systems
Trimester 1 WM353	Cyber Risks in Organisations
Trimester 2 WM361	Software Development for Engineers
Trimester 2 WM362	Systems and Network Architecture
Trimester 3 WM363	Systems Modelling and Control
Trimester 3 WM360	Signal Processing

4.0 Module information: Year three

4.1 Manufacturing and Metrology (Mechanical stream)

WM359

Summary description and aims

The aim of this module is to understand and appreciate appropriate manufacturing technologies as well as the role of metrology in an advanced production environment. A comprehensive knowledge of the modern manufacturing techniques is of vital importance for a number of engineering disciplines including Mechanical, Industrial, Manufacturing, etc. The module will cover a range of conventional and non-conventional manufacturing. In this module participants will examine how advanced manufacturing organisations make extensive use of computers and information technologies and high-precision specialist manufacturing technology to produce a heterogeneous mix of products in small or large volumes with both the efficiency of mass production and the flexibility of custom manufacturing in order to respond quickly to customer demands.

Metrology, being an integral part of manufacturing, is directly related to quality and conformity of the final product. With modern design tools and techniques, it is possible to define products and develop their virtual model, and fully validate by simulation methods. The journey from virtual design to real word cannot be fulfilled without a good understanding of the design feasibility in terms of dimensioning and tolerance definition linked with available manufacturing capabilities. This module reviews the context of metrology and manufacturing methods and their limitations for designers. The concept of uncertainty in design and product maturation are explained. Measurement technologies, their applications, related standards, and best practices are reviewed.

Learning outcomes – by the end of the module you should be able to:

- Understand, discuss and critically examine the advances in manufacturing process technology relevant to an advanced manufacturing organisation.
- Critically review and evaluate the existing manufacturing techniques associated with products that are used in their own workplace or another advanced manufacturing organisation.
- Develop a systematic approach to adopt new processes in order to achieve weight saving, accelerated time to market, quality improvements, cost reduction and/or reduced environmental impact.
- Understand and evaluate the relationship between measurement uncertainty and manufacturing process variation.
- Examine the role of dimensional measurement and management in the successful introduction of new technology.
- Critically assess measurement approaches for suitability in a complex manufacturing environment.

How is this module taught?

Normally delivered over five intensive days

- Lectures: 16 hours
- Seminars: 6 hours
- Practical work: 8 hours
- Online support: 4 hours
- Revision/consultancy: 4 hours
- Self-guided study: 112 hours (exam revision, assignment/report writing and software exercises)

How is this module assessed?

- 45% assignment (up to 2,000 words)
- 15% presentation
- 40% examination (2 hours)

Feedback for this module will be delivered through the following methods:

- Verbal feedback given during seminar/tutorial sessions.
- Written individual formative feedback on the assignment report and on the presentation.
- Written cohort-level summative feedback on the exam.

Other information:

- CATS Points: 15
- Notional learning hours: **150**
- FHEQ Level (Framework for Higher Education Qualifications – for more information see glossary): **6**

For information on how your marks are awarded see Section 5

Outline syllabus:

- Conventional and Computerised Numerically Controlled (CNC) Machine Tools: Turning, Milling, Drilling, etc
- Cutting Tool Technology – Materials, Geometry, Surface Coatings, Constraint, Working Conditions, etc

- Non-conventional Processing: Laser, EDM, Water Jet, Ultrasonic, etc
- Rapid Prototyping Techniques for Polymers and Metals (e.g. Additive Manufacturing, 3D Printing, etc)
- Composite Component Construction for High Performance and Volume Application
- Sheet Metal Forming using Conventional and Specialist Techniques such as Hydroforming and Superplastic Forming
- Metrology, Manufacturing and Variation
- Terminology and Standards
- Statistical Process Control (SPC)
- Principles and Methods of Measurement
- Coordinate Measurement Methods
- Measurement Uncertainty
- Measurement Systems Analysis

4.2 Advanced Thermodynamics (Mechanical stream)

WM368

Summary description and aims

The overall module aim is to develop the abilities to understand, model and analyse advanced thermodynamics theories and systems and apply these to engineering systems.

The module incorporates three components of thermodynamic sciences – heat transfer from fins, advanced thermodynamic cycles and heat transfer involving biological systems.

The heat transfer from the fin component will include the introduction of the fin equation and the application of the fin equation to engineering problems,

The advanced thermodynamic cycles component will include the analysis of real power heating and cooling systems using thermodynamic principles.

The heat transfer involving biological systems will include the application of heat transfer theories to biological systems and the influence of heat transfer mechanisms on human comfort.

Learning outcomes – by the end of the module you should be able to:

- Recognise the fin equation and identify its general solutions.
- Apply the boundary conditions to the fin equation and obtain a temperature profile.
- Represent a variety of real thermodynamic cycles on PV and TS diagrams and discuss the differences between real and ideal cycles.
- Apply heat transfer theories to biological systems and estimate the influence of heat transfer on human comfort.

How is this module taught?

Normally delivered over five intensive days:

- Lectures: 18 hours
- Seminars: 10 hours
- Practical class/workshop: 2 hours

- Revision/consultancy: 4 hours
- Online support: 4 hours
- Self-guided study: 112 hours (to include exam revision, assignment/report writing, software exercises)

How is this module assessed?

- Assignment 45% (up to 2,000 words)
- Presentation 15%
- Examination 40% (2 hours)

Feedback for this module will be delivered through the following methods:

- Verbal feedback given during seminar/tutorial sessions.
- Written individual formative feedback on the assignment report and on the presentation.
- Written cohort-level summative feedback on the exam.

Other information

- CATS Points: 15
- Notional learning hours: 150
- FHEQ Level: 6

Outline syllabus:

- Heat Transfer from Fins
  - The Fin Equation
  - Fin Efficiency
  - Analysis of Common Fin Configurations
  - Heat Transfer from Fins of Variable Cross Section
- Advanced Thermodynamic Cycles
  - Recap of PV and TS Diagrams
  - Isentropic and Polytropic Efficiency
  - Analysis of Power Generation Cycles including, Carnot, Otto, Diesel, Brayton and Rankine
  - Analysis of Refrigeration Cycles
- Heat Transfer involving Biological Systems
  - The Bioheat Transfer Equation
  - Thermal Comfort
  - Metabolic Heat Generation
  - Hemodynamics
  - Heat Transfer from the Human Body

4.3 Embedded Systems (Electromechanical stream, Electronic Hardware stream and Electronic Software stream)

WM356

Summary description and aims

This module introduces students to the design and analysis of computational entities which interact with physical processes and are typically built into their host system as an 'embedded system'. These processes can be found in various fields of engineering and wherever sensors and actuators are employed for controlling and monitoring their environment.

The module will present the fundamentals of embedded systems including the microcontrollers' architecture, programming languages, combinational logic and practical examples to show the trade-offs between power, performance and cost. A state-of-the-art microcontroller development suite will be used to analyse various aspects of embedded systems' hardware as well as the conversion between analogue and digital signals given the application of sensors/actuators in an industrial context.

Learning outcomes – by the end of the module you should be able to:

- Describe the fundamental building blocks and architecture of microprocessor and relate that to the 'embedded systems' controller and inter-relationships.
- Analyse, design, develop, debug, and document embedded systems using a range of languages, environments, development tools and hardware.
- Synthesise significant considerations and issues relating to embedded systems (such as power consumption, cost, reliability and safety performance, etc).
- Generate a solution for a given conditional circumstance compatible with a target micro-controller.

How is this module taught?

Normally over five intensive days

- Lectures: 18 hours
- Seminars: 5 hours
- Workshops/practical (computer) classes: 5 hours
- Tutorials: 2 hours
- Online: 4 hours
- Revision/consultancy: 4 hours
- Self-guided study: 112 hours (to include exam revision, assignment/report writing, software exercises)

How is this module assessed?

Examination: 40% (2 hours)
Assignment: 45% (up to 2,000 words)
Presentation: 15%

Feedback for this module will be delivered through the following methods:

- Verbal feedback given during seminar/tutorial sessions.
- Written individual formative feedback on the assignment report and on the presentation.
- Written cohort-level summative feedback on the exam.

Other information

- CATS Points: 15
- Notional learning hours: 150
- FHEQ Level: 6

Outline syllabus:

- Overview and Introduction
  - The History and Architecture of Embedded Systems

- Programming Languages and Development Tools
- Compilation, Assembly and Linking in the Translation Process

– Embedded Hardware/Software and Development Skills
- General Purpose Input/Output and Writing Set of Operations for them
- Asynchronous and Synchronous Serial Communication
- Data Formatting, Timing Diagrams, and Signalling Levels

– Data Acquisition and Control
- Perform Voltage to Binary and Binary to Voltage Numerical Conversions
- Embedded Designing and Programming for Monitoring Physical Properties
- Embedded Designing and Programming for Effecting Physical Control

– Advanced Features and Practices
- Interrupts, Waveform Generation and Time Measurement
- Applications of Pulse Width Modulation
- I/O Buses and Master/Slave Devices
- Wireless Ports
- Event-driven and Real-time Solutions

4.4 Analogue Systems (Electromechanical stream and Electronic Hardware stream)

WM352

Summary description and aims

The module aims to provide students with the ability to analyse and design analogue electronic circuits. They would be able to use Electronic Design Automation tools, Multisim and Labview, for different simulation analyses. It will encompass typical functions of analogue circuits: voltage and current references, operational amplifiers (internal topology and their utilisation in different closed-loop circuits), filters, signal conditioning, comparators, oscillators and signal generators.

Students will be encouraged to explore and compare the performance of different circuits with a same functionality.

Learning outcomes – by the end of the module you should be able to:

– Recognise, discriminate and apply different circuit topologies to implement a variety of analogue functions.
– Consider and distinguish practical issues associated with the selection of components.
– Use models of components to analyse the nominal or idealised behaviour of circuits.
– Perform sensitivity and worst-case analyses by use of software simulation tools.
– Design analogue electronic circuits and optimise their performance against a variety of criteria.

How is this module taught?

Normally over five intensive days.

– Lectures: 18 hours
– Seminars: 5 hours
– Tutorials: 2 hours
– Practical classes/workshops: 5 hours

- Revision/consultancy: 4 hours
- Online support: 4 hours
- Self-guided study: 112 hours (to include exam revision, assignment/report writing, software exercises)

How is this module assessed?

- Examination: 40% (2 hours)
- Assignment: 45% (up to 2,000 words)
- Presentation: 15%

Feedback for this module will be delivered using the following methods:

- Verbal feedback given during seminar/tutorial sessions.
- Written individual formative feedback on the assignment report and on the presentation.
- Written cohort-level summative feedback on the exam.

Other information:

- CATS Points: 15
- Notional learning hours: 150
- FHEQ Level: 6

Outline syllabus

- Analogue Circuit Modelling and Simulation
- Behaviour of Discrete Components
- Class AB and B Power Amplifiers
- Voltage and Current References
- Operational Amplifiers (including Internal Topology)
- Analogue Multipliers and their Applications
- Operational Transconductance Amplifiers and Applications
- Design of Analogue Filters
- Signal Selection, Processing and Conversion (including Multiplexing, ADCS and DACS)
- Comparators, Hysteresis
- Oscillators and Voltage-Controlled Oscilators
- Waveform Generators
- Worst Case Design Analysis

4.5 Cyber Risks in Organisations (Electronic Software stream)

WM353

Summary description and aims

This module aims to provide the student with the knowledge and skills to undertake security risk management where risk management is the identification, assessment and prioritisation of the effects of uncertainty on organisational objectives, followed by the coordinated and economical application of resources to minimise, monitor, and control the combination of a) the probability of an unfortunate event occurring and b) the negative impact on organisational objectives were the unfortunate event to occur. In the context of this module information is restricted to anything stored, processed or transmitted digitally.

This module aims to ensure students understand systematically addressing threats, vulnerabilities and the negative consequences that occur should a threat exploit a vulnerability in any organisation's day-to-day cyber engagement. The organisation includes the home user, commerce, and any organisation using digital networks. This embraces most organisations in existence today or likely to exist in the future.

The module will equip students to establish and maintain a risk management framework to provide assurance that information security and assurance strategies are aligned with business objectives and consistent with legal and regulatory obligations.
Various approaches to information risk management and resolution will be compared and contrasted for a simple system. There is an emphasis on the practical nature of this process and the real-world issues that face managers.

Learning outcomes – by the end of the module you should be able to:

- Outline current cyber security threats to a simple IT system.
- Outline current cyber security threats to the storage of information.
- Define practical cyber security measures to counteract intentional and unintentional human misbehaviour.
- Select the most appropriate approach to information risk management for a given organisation or scenario.
- Outline how inadequate information risk management affects organisations across a range of specific sectors.
- Demonstrate a systematic understanding of the key aspects of formulating a cyber-incident response plan.
- Evaluate the response to a cyber-incident across the incident's lifecycle.

How is this module taught?

- Lectures: 18 hours
- Seminars: 5 hours
- Tutorials: 2 hours
- Practical (computer) classes: 5 hours
- Online support: 4 hours
- Revision/consultancy: 4 hours
- Self-guided study: 112 hours (to include exam revision, assignment/report writing, software exercises)

How is this module assessed?

- Exam: 40% (2 hours)
- Assignment: 45% (up to 2,000 words)
- Presentation: 15%

Feedback for this module will be delivered through the following methods:

- Verbal feedback given during seminar/tutorial sessions.
- Written individual formative feedback on the assignment report and on the presentation.
- Written cohort-level summative feedback on the exam.

Other information

- CATS Points: 15
- Notional learning hours: 150
- FHEQ Level: 6

Outline syllabus:

- International Standards, Certification, Risk Assessment and Accreditation Process
- Organisational Life-cycle Methodologies and Processes
- Interpreting a Security Policy as an Organisational Information Security Management System (SMS) Programme
- Security
- Techniques and Controls
- Culture and Awareness
- System Management
- Operational Management
- Overview of Incident Management
- Information Risk
- Implementing a Risk Management Strategy
- Communicating Risk and Developing Uptake
- Information Security Governance

4.6 Acoustics (Mechanical stream)

WM365

Summary description and aims

Sound impacts on our daily lives in many ways, from the safety and comfort of the environments in which we live and work, to the functionality of the products that we use. The aim of this module is to understand the origins of sound, how we perceive it, and the subsequent implications for product design. The module will cover the underlying physics of sound and sound propagation, introducing the one-dimensional wave equation; along with time and frequency-domain representations of sound signals. Approaches for the measurement and analysis of sound will be introduced and discussed. Participants will learn about controlling noise, with an overview of noise legislation and its application to products and the environment.

Learning outcomes – by the end of the module you should be able to:

- Explain the core concepts of wave mechanics and how they apply to the formation and propagation of sound waves.
- Formulate expressions for sound pressure based on the one-dimensional wave equation.
- Communicate the relationship between the temporal and frequency characteristics of sound and its perception.
- Capture and analyse sound pressure data to identify key frequency components and characterise probable sound sources.

– Devise strategies to improve the noise performance of a product while optimising functional performance, cost and weight.

How is this module taught?

Concentrated in five intensive days of delivery:
– Lectures: 20 hours
– Seminars: 4 hours
– Practical class/workshops: 6 hours
– Online support: 4 hours
– Revision/consultancy: 4 hours
– Self-guided study: 112 hours (to include assignment/report writing, exam revision, software exercises)

How is this module assessed?

– Examination: 40% (2 hours)
– Assignment: 45 % (up to 2,000 words)
– Presentation: 15%

Feedback for this module will be delivered through the following methods:

– Verbal feedback given during seminar/tutorial sessions.
– Written individual formative feedback on the assignment report and on the presentation.
– Written cohort-level summative feedback on the exam.

Other information:

– CATS Points: 15
– Notional learning hours: 150
– FHEQ Level: 6

Outline syllabus:

– Introduction to Sound
– Sound Propagation
– One-dimensional Wave Equation
– Source Power and Intensity
– Time and Frequency Domain Representations
– Sinusoidal Signals and Noise Spectra
– Sound Perception
– Measuring Sound
– Acoustic Impedance and Absorption
– Reflection and Diffraction
– Noise Legislation
– Wave Motion Through Ducts
– Noise Control Methods

4.7 Vibration and Rotordynamics (Mechanical Stream and Electromechanical Stream)

WM367

Summary description and aims

The purpose of this module is to demonstrate dynamical performance of rotors and also to solve problems such as synchronous and non-synchronous whirl, sensitivity to unbalance, threshold of instability, torsional behaviour of branched systems, the analysis of steady and cyclic stress distributions caused by unbalance and other vibration phenomena.

Learning outcomes – by the end of the module you should be able to:

- Mathematically model a variety of rotating machines, including reciprocating engines, compressors, gas and steam turbines, pumps and fans.
- Predict critical speeds and determine design modifications to change them.
- Apply different techniques used in industry for the analysis of rotordynamic problems and solutions.
- Calculate balance correction masses and locations from measured vibration data.
- Solve exploitation problems related to consumer discomfort and machine life.

How is this module taught?

Normally delivered over five intensive days

- Lectures: 20 hours
- Seminars: 4 hours
- Practical class/workshops: 6 hours
- Online support: 4 hours
- Revision/consultancy: 4 hours
- Self-study: 112 hours (to include exam revision, report/assignment writing, software exercises)

How is this module assessed?

Examination: 40% (2 hours)
Assignment: 45% (up to 2,000 words)
Presentation: 15%

Feedback for this module will be delivered through the following methods:

- Verbal feedback given during seminar/tutorial sessions.
- Written individual formative feedback on the assignment report and on the presentation.
- Written cohort-level summative feedback on the exam.

Other information:

- CATS Points: 15
- Notional learning hours: 150
- FHEQ Level: 6

Outline syllabus:

- Fundamentals of Machine Vibration and Classical Solutions
  - Torsional Vibration
  - Torsional Vibration Indicators, Objectives of Torsional Vibration Analysis
  - Kinetic Energy Expression, Potential Energy
  - Torsional Vibration Measurement

  - Carrier Signal Transducers
  - Frequency-modulated Systems, Amplitude-modulated Systems
  - Frequency Analysis and the Sideband System

- Introduction to Rotordynamics Analysis
  - Objectives of Rotordynamics Analysis
  - The Spring–Mass Model
  - Synchronous and Nonsynchronous Whirl
  - Analysis of the Jeffcott Rotor
  - Critical Speed Definitions
  - Effect of Flexible (Soft) Supports
  - Rotordynamic Effects of the Force Coefficients
  - Rotordynamic Instability
  - Gyroscopic Effects

- Computer Simulations of Rotordynamics
  - Different Types of Models
  - Bearing and Seal Matrices
  - Torsional and Axial Models
  - Eigen-analysis
  - Linear Forced Response (LFR)

- Bearings and their Effect on Rotordynamics
  - Fluid Film Bearings, Fixed-geometry Sleeve Bearings, Variable-geometry Tilting Pad Bearings
  - Load Between Pivots Versus Load on Pivot
  - Influence of Preload on the Dynamic Coefficients in Tilt Pad Bearings
  - Influence of the Bearing Length or Pad Length
  - Squeeze Film Dampers/Applications
  - Insights into the Rotor–Bearing Dynamic Interaction with Soft/Stiff Bearing Supports
  - Influence on Natural Frequencies with Soft/Stiff Bearing Supports
  - Effects of Mass Distribution on the Critical Speeds with Soft/Stiff Bearing Supports
  - Influence of Overhung Mass/ Gyroscopic Moments on Natural Frequencies with Soft/Stiff Supports

- Fluid Seals and their Effect on Rotordynamics

4.8 Software Development for Engineers (Electromechanical stream and Electronic Software stream)

WM361

Summary description and aims

Software development skills are very important, not just for the software industry, but for all the engineers in the industry. On the one hand, the engineers may need to design specific software to operate machineries to perform different tasks. On the other hand, the engineers may use their domain knowledge to assist the software industry implementing the software solutions.

The aim of the module is cover software development principles and good practices.
The module covers the main phases of software development life cycle including requirements analysis, design, development, testing and maintenance. It is important for the engineers to control the changes in software development process and for that software configuration is required. A brief introduction to tools and techniques for managing changes in software, code and documentation will also be discussed in the module.
The module also aims to cover the important factors related to software quality including functionality, reliability, usability, portability and maintainability.

Learning outcomes – by the end of the module you should be able to:

- Differentiate a range of software process models used to describe software development lifecycle.
- Design and justify complex software systems using symbolic representations and illustrations.
- Know scenarios where typical design patterns can be applied, and critically evaluate these patterns.
- Use software testing during different stages of software development, design and implement software testing solutions.
- Select and evaluate appropriate tools for configuration management, version control, and quality control, etc, under enterprise environments.

How is this module taught?

- Normally delivered over five intensive days
- Lectures: 18 hours
- Seminars: 5 hours
- Tutorials: 2 hours
- Practical classes/workshops: 5 hours
- Online support: 4 hours
- Revision/consultancy: 4 hours
- Self-guided study: 112 hours (to include exam revision, writing assignment/report and software exercises)

How is this module assessed?

- Assignment: 45% (2,000 words)
- Examination: 40% (2 hours)
- Presentation: 15%

Feedback for this module will be delivered through the following methods:

- Verbal feedback given during seminar/tutorial sessions.
- Written individual formative feedback on the assignment report and on the presentation.
- Written cohort-level summative feedback on the exam.

Other information:

- CATS Points: 15
- Notional learning hours: 150
- FHEQ Level: 6

Outline syllabus:

- Importance of Software Engineering
- Software Development Methodologies
- Stages of Software Development Lifecycle
- Gathering and Analising Requirements
- Software Design using UML
- Designing the Software using UML
- Use Case Diagram
- Activity Diagram
- Sequence Diagram
- State Diagram
- Deployment Diagram
- Gang of Four Design Patterns
- Object-oriented Software Design
- Test-driven Development
- Software Testing
- Blackbox Testing
- Whitebox Testing
- Overview of Software Quality Assurance
- Program Verification Technologies and Methods
- Inspections and Code Reviews
- Software Configuration Control
- Implementing Software Changes
- Software Documentation

4.9 Electronics Manufacturing and Assembly (Electronic Hardware stream) WM355

Summary description and aims

The module aims to present the principles and techniques of electronics design for manufacture and assembly into a final product. The module will provide students with the theoretical and practical aspects of electronics design from prototyping to mass production encompassing product requirements, design constraints, manufacturing, assembly and testing methods. The module will introduce the students to the fundamentals of integrated circuits, device packaging, schematics design and layout design of printed circuits boards.

Learning outcomes – by the end of the module you should be able to:

- Demonstrate knowledge on practical issues associated with the design, manufacture and assembly of electronic circuits for mass production.
- Apply practical design considerations related to manufacturability, testing and assembly of printed circuit boards according to final product specifications.
- Correlate circuit schematics and layouts, both in direct and reverse engineering contexts.
- Design circuit schematics and lay out printed circuits boards based on component datasheets, product specifications, design constraints, manufacturing limitations and testing requirements.
- Demonstrate practical skills in the use of Computer Aided Design software for the design of complex printed circuit boards.

– Design, assemble and test a prototype printed circuit board for an electronic circuit application.

How is this module taught?

Normally delivered over five intensive days
– Lectures: 15 hours
– Seminars: 5 hours
– Practical classes/workshops: 10 hours
– Revision/consultancy: 4 hours
– Online support: 4 hours
– Self-guided study: 112 hours (to include assignment/report writing, exam revision, software exercises)

How is this module assessed?

– Examination: 40% (2 hours)
– Assignment: 45% (up to 2,000 words)
– Presentation: 15%

Feedback for this module will be delivered through the following methods:

– Verbal feedback given during seminar/tutorial sessions.
– Written individual formative feedback on the assignment report and on the presentation.
– Written cohort-level summative feedback on the exam.

Other information:

– CATS Points: 15
– Notional learning hours: 150
– FHEQ Level: 6

Outline syllabus:

– Electronic Components, Integrated Circuits and Packaging
  - IC Integration: Hybrid, Monolithic, Chip on Board.
  - IC Packaging, Surface Mount and Through Hole Technologies, Footprints.
  - Resistors, Capacitors, Diodes, Transistors, Connectors (Types and Packaging).
– Printed Circuit Boards (PCBs)
  - Single Sided, Double Sided, Multi-layer, Flexible Printed Boards.
  - Substrate and Metallisation Materials, Finishing, Layers Definition, Copper Weight.
– General Design of Printed Circuit Boards
  - Schematic Design and Components Footprints and Symbols.
  - Tracks, Pads, Vias, Polygons, Routing, Solder Lands, Thermal Relief, Component Placement, Necking.
  - Electromagnetic Interference, High Frequency Design Considerations, Cooling Methods.
– Design for Manufacture
  - Standardisation, Design Rules, Tolerances, Resolution, Board Size and Shape, Cost.
– Design for Testability
  - Test Points, Accessibility to Components (Soldering, Testing Probes), Connectors.
  - Circuit Manufacturing and Mass Production

- Manufacturing Techniques and Basic Processes, Submitting the Design Files, Specifications, Panels, Stencils, Tooling Strips.
- Circuit Assembly and Testing
- PCB Population, Soldering Methods, Wire Bonding Techniques, In-circuit Testing.

4.10 Energy Storage Systems (Electronic Hardware)

WM357

Summary description and aims

Renewable energies such as wind power, solar power, geothermal energy, hydropower or bio-energy have the potential to deliver sustainable energy on windy and sunny days or as base-load grid energy, respectively. Energy storage is needed to enable transition towards energy systems with low environmental impact.

With this in mind, the course is designed for introducing different renewable technologies and a deeper understanding of the underlying concepts and processes of energy storage. The module will provide students with a firm grounding in the thermodynamic principles of electrochemical, electrical and mechanical energy conversion with a deeper focus on fuel cells and energy storage methods, e.g., batteries, supercapacitors, by targeting technological aspects as well as simulation strategies.

Learning outcomes – by the end of the module you should be able to:

- Distinguish the different approaches of renewable energies and energy storage technologies.
- Understand the underlying physical, physico-chemical and technological concepts of energy conversion and energy storage linked with different technologies.
- Discriminate the components of advanced battery and fuel cell systems and the fundamental principles governing their operation.
- Evaluate and communicate the requirements of energy storage cell applications.
- Understand, discuss and critically examine mechanical and thermal energy storage methods, their applications and limitations.
- Discuss and comment on the components, operation and limitations of advanced energy storage systems such as batteries and supercapacitors.

How is this module taught?

- Normally delivered over five intensive days
- Lectures: 20 hours
- Seminars: 5 hours
- Practical class/workshops: 5 hours
- Online support: 4 hours
- Revision/consultancy: 4 hours
- Self-guided study: 112 hours (to include exam revision, assignment/report writing, software exercises)

How is this module assessed?

- Examination: 40% (2 hours)
- Assignment: 45% (up to 2,000 words)

– Presentation: 15%

Feedback for this module will be delivered through the following methods:

– Verbal feedback given during seminar/tutorial sessions.
– Written individual formative feedback on the assignment report and on the presentation.
– Written cohort-level summative feedback on the exam.

Other information:

– CATS Points: 15
– Notional learning hours: 150
– FHEQ Level: 6

Outline syllabus:

– Introduction of Energy Storage
  - General Background on Alternative Energy Sources and Sustainability
  - Resource Scale and Availability
  - Available Technologies and Challenges
– Fuel Cells and Hydrogen Storage
  - Types of Fuel Cells
  - Physics of PEM Fuel Cells and its Modelling
  - Hydrogen Storage Systems
– Batteries
  - Principle of Operation
  - Battery Components (Electrode, Cell, Modules and Packs)
  - Governing Physics (Coupled Electrochemical and Thermal)
  - Battery Thermal Management
– Supercapacitors
  - Aqueous and Organic-based Supercapacitors
  - Pseudo and Asymmetric Supercapacitors
– Hybrid Systems
  - Battery-Fuel Cell Hybridisation
  - Battery-Supercapacitor Hybridisation
  - Battery-Wind Turbine Hybridisation

4.11 Systems and Network Architecture

WM362

Summary description and aims

This module aims to equip students with the knowledge of computer architecture and networked computer systems required to build a small to medium-networked computer and the corresponding switching routing principles. This includes topics such as advanced IP addressing techniques (IPv4 and v6), command-line interface (CLI) configuration of Ethernet switches, routers and Virtual Local Area Networks (VLANs). Software based real-world scenarios are used to enhance the theoretical knowledge of network devices and configure both Ethernet switching and IP addressing. Automotive communication network protocols such as Flex Ray, CAN and LIN will also be covered in this module.

Skills acquired in this module will enable students to identify, plan, build and maintain networked computer systems, as well as troubleshoot common hardware and software problems in an industrial environment.

Learning outcomes – by the end of the module you should be able to:

- Describe the purpose and functions of various computer components and processor architectures.
- Compare various layers of Open System Interconnection (OSI) and TCP/IP model and contrast their associated protocols and addressing schemes.
- Design network diagrams and implement appropriate addressing schemes at a sub-network level.
- Use appropriate instructions to configure network devices and apply algorithmic approach to troubleshoot network connectivity.

How is this module taught?

Normally delivered over five intensive days

- Lectures: 18 hours
- Seminars: 5 hours
- Tutorials: 2 hours
- Practical (computer) classes/workshops: 5 hours
- Revision/consultancy: 4 hours
- Online support: 4 hours
- Self-guided study: 112 hours (to include exam revision, assignment/report writing, software exercises)

How is this module assessed?

- Examination: 40% (2 hours)
- Assignment: 45% (up to 2,000 words)
- Presentation: 15%

Feedback for this module will be delivered through the following methods:

- Verbal feedback given during seminar/tutorial sessions.
- Written individual formative feedback on the assignment report and on the presentation.
- Written cohort-level summative feedback on the exam.

Other information:

- CATS Points: 15
- Notional learning hours: 150
- FHEQ Level: 6

Outline syllabus:

- Computer Architecture and Internetworking
  - Computer Architecture; Control Units including Hardwired and Microprogrammed Control Units; Performance of Microprocessors; RISC/CISC Architectures and the Central Processing Unit (CPU)

- Storage Devices, Memory Hierarchy, Data Storage and Elementary Error Detection and Correction
- Brief Number System Reminder and Binary/Decimal Conversion for Networking
- Basics of Internetworking, Background of Data Communication (Wired, Wireless)
- Network Topologies (Star, Mesh, Hybrid) and Core/Access Tiers
- Cabling Technology, Troubleshoot Interface and Cable Issues; Network Interface Card

– The OSI Reference Model, TCP/IP Reference Model
  - The OSI Reference Model, TCP/IP Reference Model
  - Error-detection and Correction Techniques; Principles of Reliable Data Transfer
  - Network Devices: Hub, Switch, Router, Firewalls, Access Points, Wireless Controllers and their role in Connection with the TCP/IP Model

– Ethernet Technology.
  - Ethernet Technology; Multiple Access Links and Protocols (Static and Dynamic Channel Allocation)
  - MAC Addressing, Frame Format Broadcast and Collusion Domain
  - Describe and Verify Switching Concepts (MAC Learning, Frame Switching, Frame Flooding, MAC Address Table); Further Protocol Discussions such as STP Algorithm

– IP Addressing and Routing
  - Network Protocols, IPv4 Address Types (Unicast, Multicast, and Broadcast); IPv6 Basics
  - Private and Public Networks
  - Subnet Mask, Troubleshoot IPv4 Addressing and Sub-netting
  - Introducing the most Common Services such as HTTP, DNS and Email and VOIP and Corresponding Layers

– Advanced Features
  - Automotive Networks Characteristics and its Communication Requirements
  - The Combined Wired/Wireless Network Infrastructure Modes
  - Steps for Designing and Configuring a Combined Network
  - Security Aspects and Configurations in a Simple Personal or a Network-based Enterprise Architecture

4.12 Systems Modelling and Control (All streams)

WM363

Summary description and aims

Most disciplines of the engineering profession require a sound understanding of the techniques used in the modelling and control of dynamic, multi-domain physical, and other, systems. The aims of this module are: to introduce techniques and computer tools for modelling, predicting and analysing the behaviour of dynamic systems; and to introduce concepts, principles and techniques employed in classical methods of single loop feedback control design.

Learning outcomes – by the end of the module you should be able to:

- Describe and apply procedures for developing mathematical models of complex physical systems and use appropriate analytical and numerical methods for predicting their behaviour.
- Describe the key concepts and techniques used in analysing the behaviour of open loop physical systems and in designing feedback control systems.
- Use computational tools in the modelling, simulation and analysis of engineering systems.
- Apply appropriate theoretical and practical methods to the analysis and solution of engineering problems.

How is this module taught?

Normally delivered over five intensive days
- Lectures: 18 hours
- Seminars: 5 hours
- Tutorials: 2 hours
- Practical (computer) classes/workshops: 5 hours
- Online support: 4 hours
- Revision/consultancy: 4 hours
- Self-guided study: 112 hours (to include exam revision, report/assignment writing, software exercises)

How is this module assessed?

Examination: 40% (2 hours)
Assignment: 45% (up to 2,000 words)
Presentation: 15%

Feedback for this module will be delivered through the following methods:

- Verbal feedback given during seminar/tutorial sessions.
- Written individual formative feedback on the assignment report and on the presentation.
- Written cohort-level summative feedback on the exam.

Other information:

- CATS Points: 15
- Notional learning hours: 150
- FHEQ Level: 6

Outline syllabus:

- Introduction to Systems and Modelling
  - Transient Response of Linear Systems
  - Laplace Transform of First Order and Second Order Systems
  - Frequency Response of First Order and Second Order Systems
  - Bode Analysis

- Introduction to Numerical Integration
  - Numerical Integration of Differential Equations
  - Methods for Numerical Integration

- Systems

- Feedback Control Systems
- Stability Analysis using Root Locus Plots
- Proportional, Integral and Derivative (PID) Controllers
- Linear State Space Models
- Non-linear Systems
- Controllability and Observability in Control Systems

– Simulation
  - Simulation of First Order and Second Orders Systems using Simulink and Simscape
  - Integrating Simulink and Simscape together for Modelling Systems

4.13 Signal Processing (all streams)

WM360

Summary description and aims

Digital Signal Processing can analyse, modify and enhance various signals; audio, video and communication signals. It supports and enhances interfaces between humans, between machines and between humans and machines. This module provides a detailed knowledge base for the theoretical and practical techniques used in discrete-time systems. It aims to develop the students' skills in designing digital filters and using Fourier transform techniques. Several digital image processing techniques will be introduced and then used in simulations and practical laboratory sessions.

Learning outcomes – by the end of the module you should be able to:

– Use mathematical techniques to analyse the implications of the sampling theorem and the consequences of aliasing and quantisation distortion.
– Evaluate critically the theory underpinning continuous and discrete-time systems.
– Use the Fourier Transform, the Fast Fourier Transform and the Z-Transform to analyse various types of signals.
– Design finite impulse response (FIR) and infinite impulse response (IIR) digital filters and apply them to practical signal processing problems.
– Apply basic digital image processing algorithms.

How is this module taught?

– Normally delivered over five intensive days
– Lectures: 18 hours
– Seminars: 6 hours
– Tutorials: 4 hours
– Laboratory/workshop: 2 hours
– Online support: 4 hours
– Revision/consultancy: 4 hours
– Self-guided study: 112 hours (to include assignment/report writing, exam revision, software exercises)

How is this module assessed?

– Examination: 40% (2 hours)

- Assignment: 45% (up to 2,000 words)
- Presentation: 15%

Feedback for this module will be delivered through the following methods:

- Verbal feedback given during seminar/tutorial sessions.
- Written individual formative feedback on the assignment report and on the presentation.
- Written cohort-level summative feedback on the exam.

Other information:

- CATS Points: 15
- Notional learning hours: 150
- FHEQ Level: 6

Outline syllabus:

- Linear Time Invariant Systems
  - Continuous and Discrete Time Signals
  - Introduction to Linear Time Invariant Systems
  - Properties of Linear Time-Invariant (LTI) Systems
  - Shift Invariance, Stability and Causality
  - Impulse Response and Difference Equations

- Discrete Fourier Transform
  - Transform Definitions and its Properties
  - Fourier Transform of LTI System
  - Inverse Fourier Transform

- Z-Transform
  - Transform Definition and its Properties
  - Regions of Convergence
  - Inverse Z Transform
  - Relation of Discrete Fourier Transform with Z-transform

- Sampling and Reconstruction
  - Linear and Cyclic Convolution
  - Sampling and Reconstruction of Continuous-time Signals
  - Aliasing and Re-sampling Digital Signals

- Digital Filters
  - Properties of Digital Filters
  - Digital Filter Design Techniques
  - Window Designing Techniques for Finite Impulse Response Filters
  - Bilinear Transform Method for Designing Infinite Impulse Response Filters
  - Structural Properties of FIR and IIR Filters

- Fast Fourier Transform
  - Decimation in Time using Fast Fourier Transform
  - Decimation in Frequency using Fast Fourier Transform
  - Introduction to Image Processing Techniques

5.0 Overarching learning outcomes for your third and fourth year of study

Framework for Higher Education Qualifications - Level 6 descriptor

On completion of your level 6 modules (taken over years three and four) you should have:

- A systematic understanding of key aspects of your field of study, including acquisition of coherent and detailed knowledge, at least some of which is at, or informed by, the forefront of defined aspects of a discipline.

- An ability to deploy accurately established techniques of analysis and enquiry within a discipline.

- A conceptual understanding that enables the student:
  - To devise and sustain arguments, and/or to solve problems, using ideas and techniques, some of which are at the forefront of a discipline.
  - To describe and comment upon particular aspects of current research, or equivalent advanced scholarship, in the discipline.

- An appreciation of the uncertainty, ambiguity and limits of knowledge.

- The ability to manage their own learning, and to make use of scholarly reviews and primary sources (for example, refereed research articles and/or original materials appropriate to the discipline).

Typically, holders of level 6 qualifications will be able to:

- Apply the methods and techniques that they have learned to review, consolidate, extend and apply their knowledge and understanding, and to initiate and carry out projects.
- Critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), to make judgements, and to frame appropriate questions to achieve a solution or identify a range of solutions – to a problem.
- Communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.

And you will have:

- The qualities and transferable skills necessary for employment requiring:
  - The exercise of initiative and personal responsibility.
  - Decision-making in complex and unpredictable contexts.
  - The learning ability needed to undertake appropriate further training of a professional or equivalent nature.

Higher education credit framework for England: guidance on academic credit arrangements in higher education in England

Level 6 descriptor – On completion of your level 6 modules (taken over years three and four you will be able to be able to:

Critically review, consolidate and extend a systematic and coherent body of knowledge, utilising specialised skills across an area of study; critically evaluate concepts and evidence from a range of sources; transfer and apply diagnostic and creative skills and exercise significant judgement in a range of situations; and accept accountability for determining and achieving personal and/or group outcomes.

6.0 Submitting your work

6.1 To submit coursework

You will need to submit your assignments through Tabula. During submission your work will be checked for plagiarism through "Turn It In". If you have problems accessing Tabula you can contact wmgdysonbeng@warwick.ac.uk and the module lead.

It is important you meet the assignment requirements in terms of formatting and referencing. It is your responsibility to ensure the correct version of your assignment is submitted. You will also need to keep at least one electronic copy of your submitted coursework to be available for immediate resubmission if required.

7.0 How your marks are awarded

You will need to pass each module with a minimum of 40%

For information about resitting an exam see section 8 and for information about extensions and mitigating circumstances see section 9.

In year three you should pass all your modules in order to progress. Your marks from this year will contribute 40% towards your overall degree classification.

7.1 Marking scale for assessments that have absolute answers

For examinations and assignments that have a definitive right and wrong answers you will be marked on a scale of 0-100%.

Your marks will fall into an overall 'class' of performance which align to degree classifications. This helps you keep track of your performance in terms of your end result at the end of year four.

Percentage score	Classification of performance
70 – 100%	First Class
60 – 69%	Second Class, Upper Division (also referred to as "Upper Second" or "2.1")
50 – 59%	Second Class, Lower Division (also referred to as "Lower Second" or "2.2")
40 – 49%	Third Class
0 – 39%	Fail

7.2 Marking scale for other assessment types (e.g. group-work, essays or presentations)

For assignments that do not have a definitive answer WMG will use a scale of 20 marks which are "banded" within the degree classifications.

Percentage score	Scale	Classification of performance	Descriptor
100	Excellent First		Work of original and exceptional quality which in the examiners' judgement merits special recognition by the award of the highest possible mark.
94			Exceptional work of the highest quality, demonstrating excellent knowledge and understanding, analysis, organisation, accuracy, relevance, presentation and appropriate skills. At final-year level: work may achieve or be close to publishable standard.
88	High First	First Class	Very high-quality work demonstrating excellent knowledge and understanding, analysis, organisation, accuracy, relevance, presentation and appropriate skills. Work which may extend existing debates or interpretations.
82	Upper Mid First		
78	Lower Mid First		
74	Low 1st		
68	High 2:1	Upper Second (2:1)	High-quality work demonstrating good knowledge and understanding analysis, organisation, accuracy, presentation and appropriate skills.
65	Mid 2:1		
62	Low 2:1		
58	High 2:2	Lower Second (2:2)	Competent work, demonstrating reasonable knowledge and understanding some analysis, organisation, accuracy, relevance, presentation and appropriate skills.
55	Mid 2:2		
52	Low 2:2		
48	High 3rd	Third	Work of limited quality, demonstrating some relevant knowledge and understanding.
45	Mid 3rd		
42	Low 3rd		
38	High Fail (Sub Honours)	Fail	Work does not meet standards required for appropriate stage of an Honours degree. Evidence of study demonstrates some knowledge and some basic understanding of relevant concepts and techniques, but subject to significant omissions and errors.
32	Fail		Work is significantly below standard for appropriate stage of an Honours degree. Some evidence of study and some knowledge and evidence of understanding but subject to very serious omissions and errors.
25	Low Fail		

12			Poor quality work well below the standards standard for appropriate stage of an Honours degree.
0	Zero		Work of no merit OR absent, work not submitted, penalty for academic misconduct.

Some descriptors cover a range of marks, the location of your mark within each group is dependent on the extent to which the elements in the marking criteria descriptor are met.

7.3 How your submitted work is marked

- Your assignment is initially marked by the module tutor(s) who set the assessment.
- Your work is marked again by a second marker (an expert in the relevant field or another module tutor).
- A sample (not less than 20%) of the marked assignments is then reviewed by a moderator.
- If there are discrepancies in some marks, then both markers and the moderator meet to discuss all the marks. The marker and moderator also agree on the feedback given to individual students, groups and/or the whole cohort.

7.4 Feedback

You are entitled to timely and constructive feedback on all your academic work and progress.

Your feedback will be either formative as you progress through your modules or summative at the end of the module or assessment.

7.5 When are my results published?

Your individual module exam results are published on Tabula 20 working days after an exam. The WMG programme coordinator will email you letting you know that the marks are available.

Your end-of-year results go to The University of Warwick Board of Examiners at the end of July. Your results will be available on Tabula at the start of August.

8.0 Resits

Third year undergraduate examinations

You should pass all modules in year three with at least 40% to enable you to progress to the next year. If you don't achieve this you will be advised to resit that module – usually during the first week of September. It is advisable not to pre-book leave in this period unless you are confident you have passed all your modules.

Your resit exam is capped at 40%. If you fail a second time after a resit you may not be able to progress.

You will be informed by the Secretaries to the Third-Year Boards of Examiners of the modules if you are required to resit, and you will be informed as to when the resit examinations are held (normally the first full week of September).

If you fail your resits, you may be required to withdraw from the University and The Dyson Institute. Under certain defined circumstances you have the right to appeal against this decision (see the section on Appeals for further information).

Resit examination results are normally released within a week of the relevant exam board, although WMG will endeavour to get them out within one to two days.

9.0 Mitigating circumstances

9.1 Introduction

During your time at The Dyson Institute you might experience exceptional unforeseen short term circumstances which are outside your control and might adversely affect your studies or ability to complete and exam. For example, you might have a late identification of a disability and so reasonable adjustments to assessments might not be in place. These scenarios are dealt with through the University of Warwick's mitigating circumstances procedure.

We recognise that the mitigating circumstances might involve sensitive and confidential information. However, it is vital that you advise your module lead, course lead (Mat Sokola) or address your submission directly to the Mitigating Circumstances Panel (if you are concerned about confidentiality) as soon as possible that you intend to report mitigating circumstances. They will be able to provide information and guidance about the process. It is your responsibility to disclose your mitigating circumstances within the given deadlines and provide the required evidence to support them.

In addition, you might find it more comfortable to speak with any of the following Institute staff who will be able to offer signposting and guidance about the process:

Programme Leads (Bob Tricklebank or Matt Wilson)
Cohort Student Support Advisor
The Academic Support Team (Ned Carpenter or Ben Fitzpatrick)
The Regulation Team (Ruth Burchell or Robyn Skelton)

9.2 Mitigating circumstances are defined as:

– Situations that you could not have predicted and had no control over (e.g. serious illness, death of someone close, being the victim of a crime, family difficulties and unforeseen financial hardship).

– Situations with significant impact on your ability to undertake assessments/examinations which are independently evidenced in a timely fashion; (e.g. doctor's note during illness showing duration and level of negative impact).
– Situations that are acute or short term, the timing of which are relevant to the impact on your study (normally within three weeks of the relevant assessment event or deadline).

In general terms, mitigating circumstances must be:
(a) Significant (they have more than a minor impact on you).
(b) Unexpected (you must have had no prior knowledge of the event).
(c) Unpreventable (there was no reasonable steps you could have taken to prevent the event).
(d) Relevant (you must be able to link the event, and its impact on the period for which your claim is being made).
(e) Corroborated (it must be independently verifiable*).

*For detailed guidance about the evidence requirements for submitting mitigating circumstances please see: Mitigating Circumstances: Advice for Students - https://warwick.ac.uk/services/aro/dar/quality/categories/examinations/policies/u_mitigatingcircumstances/mc_guidance_for_students_final_revised_2_100119.pdf

The table below shows claims based on the following are normally and not normally considered to fall within the definition of mitigating circumstances – these lists are not exhaustive. Claims must be evidenced as described above.

Claims normally to be considered within the definition of mitigating circumstances	**Claims not normally to be considered within the definition of mitigating circumstances**
A significant deterioration of a permanent or chronic condition close to assessment (normally within three weeks of the assessment due) which you have already reported and is already covered by reasonable adjustments.	A permanent or chronic condition which you already have told us about and is covered by reasonable adjustments.
Reasonable adjustments for a pre-existing condition already reported (as above) do not fully address the impact of the condition and still leave you at a disadvantage over others.	Circumstances that do not relate to the assessment period in question unless independent evidence is provided that demonstrates the ongoing detrimental impact of a personal situation/medical condition.
Serious illness (physical or mental), accident or severe trauma at the time of the assessment or during the preparation for it.	Minor illnesses or injuries (e.g. coughs, colds etc.) not requiring treatment from a qualified practitioner and that in a work situation would not normally lead to absence.
Death of someone close to you around the time of the assessment.	Minor illness of relatives (unless you have a substantial care or support responsibilities for that person).
Serious illness or accident (including significant caring responsibilities) of	Examination stress and anxiety, unless a flare up of a pre-diagnosed illness/condition.

someone close to you at the time of the assessment.	
Significant change in employment circumstances beyond your control (part-time students only).	Stress or symptoms of anxiety or low mood which do not meet the criteria or threshold for a diagnosis of an anxiety or mood disorder.
Significant change in personal or unforeseen financial circumstances (e.g. divorce of student, fire, court appearance of student, acute accommodation crisis).	Pressure of academic workload.
Late diagnosis of a disability including Specific Learning Difficulty (SpLD).	Computer, printer or other IT failure.
Bullying, harassment or threatening behaviour).	Temporary self-induced conditions e.g. hangover.
Victim of a crime or involvement in a criminal case (e.g as a witness).	Travel disruption (e.g. traffic jams/delayed trains).
It has been suggested that students observing the Ramadan fast may not be best placed to take examinations. Students are reminded that presenting themselves for a University examination is taken to imply fitness to undertake the examination. If, however, a student feels that observance of the Ramadan fast has had a significant adverse health effect on their examination performance and can provide confirmatory medical evidence, they may request that this be considered as potential special evidence by the relevant Board of Examiners.	Misreading or misinterpretation of an assessment title, date, time or deadline.
	Assessment dates being clustered or close together unless there has been a specific recommendation for reasonable adjustment which includes spacing of assessment dates.
	Employment or other types of external work (unless due to hardship that could not be foreseen).
	Non-academic activities and events that can be planned (such as holiday, moving house, weddings, normal sporting events or that were foreseeable and preventable.
	Late disclosure of circumstances on the basis that the student did not feel comfortable submitting mitigating circumstances prior to the relevant Board of Examiners' Meeting where marks are confirmed (i.e. only submitting mitigation after they have failed an assessment).
	Staff absence due to illness or other unforeseen circumstances.
	Ignorance of the regulations or examination or assessment arrangements.

For mitigating circumstances relating to mental health difficulties please consult with your Dyson Institute Student Support Advisor, Wiltshire Psychology Services practitioner or the University Disability Team or Counselling Service.

9.3 Requesting mitigating circumstances

If you need to submit mitigating circumstances, we recommend you speak with the module lead or course lead in the first instance to establish the best course of action. You can also speak to a member of The Dyson Institute team for further advice should you wish to.

To submit a claim you must complete the "Declare Mitigating Circumstances claim form" which can be found on the personal circumstances tab at: https://tabula.warwick.ac.uk https://warwick.ac.uk/fac/sci/wmg/education/degree-apprenticeships/courses/dyson/dyson_undergraduate_programme/study_support/mit_circs_declaration_form via your Course Lead, or from a member of The Dyson Institute team.

The form must be submitted as soon as possible after the mitigating circumstances have occurred and within 24 hours of the deadline of the assessment or within 24 hours of the exam with evidence if you have it. If you do not have the evidence immediately available it should be submitted within five working days of the submission being made.

Email your completed form and evidence (for details of acceptable evidence see section 9.4) to wmgdysonbeng@warwick.ac.uk. It will be treated with confidence and in compliance with Data Protection legislation.

If you are unable to submit your evidence with your claim, it is important that you still submit your claim within the deadline BUT highlight that you are still awaiting evidence and give details as to when it was requested and is expected. Evidence should be submitted within five working days of the submission being made.

Your claim will be forwarded to the Mitigating Circumstances Panel (MCP).

Your claim and evidence will be considered by the MCP which will hold meetings each month. More information, including meeting dates, can be found at: https://warwick.ac.uk/fac/sci/wmg/education/undergraduate/studentportal/supportandwellbeing/mitigatingcircumstances.

This panel will grade your claim then make a recommendation either to the end-of-year exam board or for further action during the year. This will be communicated to you after the MCP meeting., More information on the grading for claims can be and possible outcomes are detailed in section 9.5.

The outcome of your mitigating circumstances submission should be relayed by WMG within seven days of the relevant Mitigating Circumstances Panel. Although the final result of the mitigating circumstances may not be determined until the end-of-year exam board or even the end-of-final-year exam board as mitigating circumstances can be carried forward.

9.4 Evidence for mitigating circumstances

The following is deemed as acceptable evidence and must accompany your claim or be submitted in accordance with the guidance above:

- Written by an independent qualified practitioner (letters from relatives are not acceptable). It must be dated and written on official notepaper and in English. If it is in another language you must provide a copy of the original note and a certified

translation into English. The University may seek verification as to the accuracy of the translation.

- Photocopied or scanned evidence is acceptable.

- It must be written around the time you were experiencing your circumstances in order for the assessment to be made on the impact of your claim. Evidence written sometime after the event will not normally be accepted as it is not possible to evidence the impact of the claim on the individual during the period affected.

- Comprehensive and up-to-date evidence referring to physical or mental health should be obtained normally after an appropriate face to face consultation. Evidence obtained over the phone (unless from a UK GP) or over the internet maybe given with less weight and will be rejected if it has been written sometime after the event.

- If a student has informed the department of mitigating circumstances but they are waiting for evidence and are worried it will not arrive in time, the student MUST highlight that they are still awaiting evidence, report when it was requested, when it is likely to arrive and who it will be coming from.

- The University reserves the right to check the legitimacy of any evidence provided. If any submission is found to be fabricated or altered then the student may be investigated under Regulation 23, Student Disciplinary Offences.
  https://warwick.ac.uk/services/gov/calendar/section2/regulations

9.5 Decisions on mitigating circumstances

The MCP will grade the mitigating circumstances as follows and then give a recommendation as detailed below:

Grading of mitigating circumstances
The claim was rejected.
Weak: (a) The mitigating circumstances were considered mild, and/or had little material effect on the student's academic performance. For example, the circumstances fall within the normal level of everyday life that a person with normal emotional resilience would be expected to cope with. OR (b) There is weak evidence (or the evidence is post-hoc in nature) detailing the level of impact on the student making it impossible to assess the impact with reasonable certainty.
The claim is deemed moderate: Medical or other circumstances where substantial impairment of a student's performance would be expected and is evidenced with some reasonable degree of certainty.
The claim is deemed severe: Severe circumstances which would be highly detrimental to a student's academic performance and is evidenced with a high level of certainty.

Recommendations based on the grading above might be:

- The claim was rejected.

- The mitigating circumstances were considered weak, and/or had little material effect on the student's academic performance.
- Waive or reduce penalties for late submission of assessed work.
- A student who has failed to submit a piece of work for assessment with a credit weighting of three credits or less may have that piece of assessment waived if the Board of Examiners concludes it is not in the student's interest (or it is not possible) to reschedule it. The module mark will be recalculated.
- Allow further re-sit (examination)/re-submit (assessed work) opportunity. This would be as a final attempt so the marks will be capped at the pass mark.
- Allow a further sit (examination)/submit (assessed work) opportunity. This would be as a first attempt.
- Proceed with low credit to the next year of study. With implications clearly communicated.
- Subject to any restrictions imposed by accreditation or professional certification, recommend to award a degree (or other qualification), or award of a higher class of degree than would be merited by the marks returned.
- Recommend to the to the Academic Registrar that the student should be granted a repeat of the year in full as a final attempt so that the marks are capped at the pass mark and there will be no further attempt to remedy failure. Note this will incur another set of fees.
- Recommend to the Academic Registrar that the student should be granted a repeat of the year in full as a first attempt so that marks will not be capped. Note this will incur fees.

9.6 Requesting an extension

If you can't complete an assignment or a piece of coursework because of unforeseen circumstances, you need to contact the Module Leader straight away and fill out an assignment extension request to ask for an extension. You must do this prior to the assignment deadline.

Requests made after the submission date will not normally be considered. Extension requests can be requested online in Tabula here:
https://tabula.warwick.ac.uk / https://warwick.ac.uk/fac/sci/wmg/education/degree-apprenticeships/courses/dyson/dyson_undergraduate_programme/study_support/dyson_assignment_extensions

Any application for an extension is considered in the same way as claims for mitigating circumstances and needs to be supported by evidence (e.g. a medical note) and should specify the extension time you need. If no evidence is submitted with the request, it's unlikely that it will be authorised.

For information guidance about the evidence requirements for submitting mitigating circumstances or extension requests please see section 910.4 or Mitigating Circumstances: Advice for Students at:
https://warwick.ac.uk/services/aro/dar/quality/categories/examinations/policies/u_mitigatingcircumstances/mc_guidance_for_students_final_revised_2_100119.pdf

Computing, printing difficulties or high workload won't be accepted as a valid reason for a late submission or extension request. You're advised to finish work well before the deadline.

You should receive a decision on your request for an extension from the Director of Studies (with input from the Course Lead) Mitigating Circumstances Panel within THREE WORKING DAYS.

If you haven't been granted an extension and your work is submitted late, your mark will be reduced by 5% for each working day that it's overdue. Assignments received after the deadline, but on the day of submission, will still incur a 5% penalty.

10.0 Concerns

10.1 What is a concern?

A concern is where a student makes comment (in conversation, writing or via social media) on the provision of learning opportunities made available, or for any service that the provider may offer.

10.2 Registering a concern at The Dyson Institute

Here at The Dyson Institute we have a mechanism for dealing with your concerns and feedback and we aim to resolve any suggestions for improvements, queries, or concerns quickly and efficiently.

To raise a concern or resolve a query, speak to a staff member from The Dyson Institute or WMG staff in the first instance.

Alternatively, you can email feedbackdysoninstitute@dyson.com directly if you feel more comfortable. Or, email if you do not feel you have had satisfactory resolution to your query.

This email account is checked every other day by the Regulation team, and the concern is logged and tracked and forwarded to an appropriate member of staff at The Institute or WMG.

They will receive an instruction to respond within five or 10 working days (sometimes more depending on the nature of the concern). Staff are requested to copy the Regulation team into their response.

Once you have received a response you will be contacted to check that you are happy to close the concern or if ongoing action is required.

Please state your issue clearly, how long the issue has been going on, what (if any) steps you have taken to get resolve, any suggested solutions and what you would like to happen.

11.0 Academic appeals

11.1 What is an academic appeal?

A request for a review of a decision of an academic body around a mark, outcome or decision. You can appeal an outcome on the basis of evidence or procedure, but not on the basis of disagreement with academic judgement.

As a University of Warwick enrolled student you align to the University's Academic Appeals policies and procedures.

11.2 Grounds for appeal

First-year and intermediate undergraduate students have the right to appeal only against a decision that they be required to withdraw from their course of study, and then only if they are in possession of relevant evidence which was not available to the Board of Examiners when its decision was reached and can provide good reason for not having made the Board of Examiners aware of this evidence previously.

If you are still dissatisfied with the outcome of your appeal you can raise an appeal through the Office of the Independent Adjudicator (OIA – https://www.oiahe.org.uk/) within 12 months of receiving your Completion of Procedures letter.

11.3 Making an appeal

You are required to complete a form if you wish to appeal. Please read and use the guidance and form available through the link below:

https://warwick.ac.uk/services/academicoffice/examinations/students/appeals/regulation_42_academic_appeal_form_revised_with_privacy_notice_revised_280619_final_wot.docx

The Academic Appeal Form must be submitted to SEMFacultyBoard@warwick.ac.uk within 10 University working days of the date of notification of the decision or result that is the subject of the appeal. Academic Appeal Forms received after this date will be considered only if there are exceptional reasons why you could not comply with the relevant deadlines which must be accompanied by supporting evidence.

This form, which includes contact details for advice on appeal procedures, is available via the link further down this page. Appeals by first-year students are administered by the Faculty Secretariat of the appropriate Faculty Board (please see the appeal form for further details and faculty contacts).

According to University Regulations no other decisions of Boards of Examiners are open to appeal. *Please note the appeal procedures may not be used to challenge the academic judgement of examiners, nor to dispute marks awarded in individual modules or pieces of work.*

The process for considering appeals is set out in University Regulation 42, which is available here:
https://warwick.ac.uk/services/gov/calendar/section2/regulations/reg42academicappeals

The University of Warwick normally aims to complete the academic appeals process within 80 University working days. If this timeframe is not achievable, you will be informed about a delay at the earliest possible opportunity. If you have been notified that you are required to withdraw from your course of study, this may mean that even if your appeal is successful, it is unlikely your appeal will be resolved in time for you to continue into the next academic year.

A Completion of Procedures letter will be issued to you when the internal complaints/appeals procedures of the University have been completed. This will set out the issues that were considered in your complaint/appeal and the University's final decision. The Completion of Procedures letter will also explain how you can apply for a review of your complaint/appeal to the Office of the Independent Adjudicator for Higher Education (OIA).

12.0 Complaints

12.1 What is a complaint?

A specific query about an aspect of the student experience. As a University of Warwick enrolled student you align to the University's complaints policies and procedures.

12.2 Complaints process

If you cannot find resolution for your concern through the Concerns Log at The Dyson Intitute, you may wish to submit a complaint through the formal University of Warwick complaints procedure.

Stage 1: Frontline/Local Resolution

You should contact the Course Lead or Dyson Institute Directors about your problem.

You can do this in person, by email, in writing or by phone to register your complaint. WMG request that in the first instance that you contact the Course Leader.

Warwick will then investigate your complaint and you will receive a response typically within 20 University working days.

Stage 2: Formal Departmental Investigation and Resolution

Seek support and advice: Wellbeing Support Services, the Students' Union Advice Centre, and/or your Personal Tutor or Supervisor within your department. In addition to Warwick staff, support can be found with Bob, Matt, Lieha, Ilona or a member of the Regulation team.

Download and complete the Formal Stage 2 Departmental Resolution Complaint form found here: https://warwick.ac.uk/services/feedbackcomplaints/students/complaints/stage2/.

Submit your completed Stage 2 Complaint Form, together with any relevant documentation and evidence, via the online Stage 2 Student Complaint Submission Page found here: https://warwick.ac.uk/services/feedbackcomplaints/students/complaints/stage2/submission/.

Stage 3: Formal Institutional Review and Final Resolution

Seek support and advice: Wellbeing Support Services, the Students' Union Advice Centre, and/or your Personal Tutor or Supervisor within your department. In addition to Warwick staff, support can be found with Bob, Matt, Lieha, Ilona or a member of the Quality team.

Download and complete the Stage 3 Formal Student Complaints form (Word Document) found here: https://warwick.ac.uk/services/feedbackcomplaints/students/complaints/stage3/.

Submit your completed Stage 3 Complaint Form within 10 University working days from the date of receipt of your Stage 2 outcome, together with any relevant documentation and evidence, via the online Stage 3 Formal Institutional Review and Final Resolution Submission page found here:
https://warwick.ac.uk/services/feedbackcomplaints/students/complaints/stage3/submission/.

Note that you need to be signed in with a University login code in order to allow the forms in Stages 2 and 3 to be submitted. If you have questions about the procedure, cannot access the form or are unable to complete and submit a written complaint please contact studentcomplaints@warwick.ac.uk, or speak to the University of Warwick's Student Complaints Officer on 02476 150445.

13.0 Academic misconduct

13.1 What is academic misconduct?

Academic misconduct is any action or attempted action that may result in creating an unfair academic advantage for yourself or an unfair academic advantage for anyone else.

It undermines the standard of your qualification and that of your peers. The Dyson Institute in partnership with the University of Warwick takes academic misconduct very seriously and is defined as any inappropriate activity or behaviour by a student that may give that student or another student an unpermitted academic advantage in assessment.

Types of academic misconduct include:

13.1.1 Plagiarism

Plagiarism is the reproduction, and presentation as one's own, of the words or ideas of another. Plagiarism can also include self-plagiarism – that is repeating one's own, earlier work, without acknowledgement.

Examples of these kinds of plagiarism include:

– Verbatim copying of another individual/institution's work without acknowledgement.
– Close paraphrasing of another's work by simply changing a few words or altering the order of presentation, without acknowledgement.
– Unacknowledged quotation of phrases from another's work.
– The deliberate and detailed presentation of another's concept as one's own.

Good and accurate referencing in your work is important.

13.1.2 Collusion

Collusion is the collaboration by a student with another person in producing a piece of work submitted for assessment, where that piece of work is presented as being solely the work of the student.

This can take the form of conscious collaboration, without official approval, between two or more students in the preparation and production of work which is ultimately submitted by each in an identical, or substantially similar form and/or is represented by each to be the product of his or her individual efforts.

Collusion also occurs where there is unauthorised co-operation between a student and another person in the preparation and production of work which is presented as the student's own.

Be careful what you share with your friends.

13.1.3 Contract cheating

Where a student is found to have submitted work for assessment that is procured through a third party, with or without a payment being made, this would be considered "contract cheating" and would therefore fall under the remit of plagiarism as defined above.

Where work has been passed to a third party for proofreading and this has resulted in changes to the work which go beyond that which is deemed appropriate in the University's' Proof Reading Guidance, this would be considered a form of cheating, whether or not the work was paid for.

The University acknowledges that students may wish to seek assistance from third parties, whether they be friends, family or professional proofreaders, to review their work prior to submission. The University's policy on proofreading sets out what the University considers to be acceptable practice in this area and can be found here.

If you are struggling with a deadline or subject matter – talk to someone, there are options available.

Other types of academic misconduct

13.1.4 Ghosting

Where one student produces work for another, regardless of financial gain. Both will be considered guilty of academic misconduct and both will be disciplined.

If a friend asks you to write for them – are you really helping them?

13.1.5 Falsification

Presenting and/or knowingly making use of false or distorted data, evidence, references, citations or results. It includes claiming to have carried out experiments, observations or other forms of research that have not taken place.

The people marking your work will spot anomalies.

13.1.6 Cheating

To seek an unfair advantage in assessment – this might include:
– Seeking extensions or mitigating circumstances under false pretences.
– Copying the work of another student in an exam.
– Communicating during an examination with any person other than an authorised staff member.
– Gaining access to unauthorised material prior to an examination or assessment (i.e. examination papers).
– Taking unauthorised materials into an exam (such as a phone or unauthorised reference materials).
– Making library texts or other necessary materials unavailable to other students.
– Gaining prior knowledge of an assessment.
– Pressuring other students into assisting with assessed work.

You are not just cheating yourself but your peers who have worked hard to get themselves to a standard to pass. If you are struggling, talk to someone.

13.1.7 Personation

Assuming the identity of another student (of The Dyson Institute or from any Institution) with the intention of gaining an unfair advantage for that student. This includes a student who allows another to impersonate them to gain an unfair advantage.

Don't risk your friends by having them cheat for you – don't risk your own academic record by impersonating someone else, even if you are just trying to help.

13.2 Process for dealing with academic misconduct – exams

As a registered student of the University of Warwick, the University's policies and processed apply to your academic studies. The information relating to the procedures that have to be carried out in the event of an allegation being made is detailed below, with further guidance to be found through the following link:

https://warwick.ac.uk/services/aro/dar/quality/categories/examinations/policies/i_suspectedcheating

https://warwick.ac.uk/services/gov/calendar/section2/regulations/cheating/

If you are in possession of unauthorised materials or are suspected of cheating in an exam you will be required to stay at their desk at the end of their examination and complete a Student Incident Form.

The form will be sent to the Examinations Section and the procedures under Regulation 11 instigated.' You will be warned that a report will be made to the Academic Registrar, and be

informed that you may make a written statement, to be submitted to the Academic Registrar, before the meeting of an Investigating Committee of the Senate (ICS)

You will be provided with a statement of the allegations made against you by the Academic Registrar them, together with copies of any supporting evidence, at least five days before the meeting of the ICS.

The invigilator's report and your statement, if any, shall be considered by an ICS, whose membership shall be appointed by the Vice-Chancellor and shall be chaired by the Chair of a Faculty Board or the Chair of a Faculty Education Committee (as appropriate) The ICS shall not include any member of the student's department.

The Head(s) of the Department(s) responsible for the module(s) concerned shall present the case and shall have a right to call the invigilators and/or other witnesses to appear before the committee.

If you wish, you have the right to appear before the ICS, and you may invite one other person to attend the committee. The name and status of any person accompanying you must be notified to the chair of the ICS via the Academic Registrar in advance of the meeting. You also have the right to request witnesses to appear before the committee and/or to provide the committee with a written statement prior to its meeting.

If the ICS is not satisfied that there is a case of cheating to answer, you shall be informed and the matter shall end there. The chair of the ICS may also take chair's action to dismiss a case prior to any committee meeting if they judge that there is no case to answer.
If the ICS is satisfied that cheating has taken place it shall determine the penalty and inform the appropriate Board of Examiners and you accordingly.

You have the right of appeal against either the decision of the ICS or the penalty. Any appeal must be submitted in writing to the Academic Registrar within 10 days of the notification of the ICS's decision to the student. Details of this appeals process can be found here: https://warwick.ac.uk/services/gov/calendar/section2/regulations/cheating/.

Cheating suspected by marking examiner

If an examiner who when marking examination scripts suspects that cheating has taken place will need to consult the Head of the Department.

If the Head of Department considers that cheating has occurred according to the definitions set out in the University Regulations, they shall make a full report to the Academic Registrar and shall warn the student that this report has been made.

The Head of Department shall also inform you that you may make a written statement to be submitted to the Academic Registrar before the meeting of the ICS. The procedure as described above will follow.

13.3 Process for dealing with Academic Misconduct – essays, dissertations, reports and other assessed work, not undertaken under examination

As a registered student of the University of Warwick the University's policies and processed apply to your academic studies. The information relating to the procedures that have to be carried out in the event of an allegation being made is detailed below, with further guidance to be found in through the following link:

https://warwick.ac.uk/services/aro/dar/quality/categories/examinations/policies/i_suspectedcheating

https://warwick.ac.uk/services/gov/calendar/section2/regulations/cheating/

Where there is suspicion that you (as a current or former student) have reproduced in an assessment your own work which has previously been submitted or work of another person or persons without proper acknowledgement, the Head of the Department responsible for the module(s) concerned shall be consulted.

If the Head of the Department considers that an academic misconduct offence may have occurred according to the definition set out in the University Regulations, they shall follow one of the following two options, noting that the Senate Examination and Degree Conventions should first be consulted for guidance on whether an allegation should be referred for consideration by an ICS.

Option 1: The Head of Department can exercise discretion to pursue the matter without reference to an ICS, in which case they shall inform you of the allegation and provide the student with reasonable opportunity to make representations on their own behalf, before determining whether an offence has occurred. For details of the potential outcome of this route see section 14.4.

Option 2: The Head of Department makes a full report to the Academic Registrar, thereby invoking the procedures set out in paragraphs below:

Where the alleged offence relates to an assessment which contributed to the previous approval of an academic award or honour to the candidate, the Head of Department shall make a full report to the Academic Registrar, and invokes the procedure set out in paragraphs below.

In all cases where a report has been submitted by the Head of Department to the Academic Registrar, the Head shall warn you that this report has been made, and communicate that you may make a written statement to be submitted to the Academic Registrar before the meeting of an ICS. The Academic Registrar will provide you with a statement of the allegations made, together with copies of any supporting evidence, at least five days before the meeting of the ICS.

The reports shall be considered by an ICS, whose membership shall be appointed by the Vice-Chancellor and shall be chaired by the chair of a Faculty Board or the chair of a Faculty Education Committee. The ICS shall not include any member of the student's department. In considering the case the ICS shall take into account the faculty and/or departmental instructions in relation to assessed work as well as the definitions in relation to cheating set out in University Regulations.

The Head of the Department responsible for the module(s) concerned shall present the case and shall have a right to call witnesses to appear before the committee.

If you wish, you have the right to appear before the ICS, and you may invite one other person to attend the committee. The name and status of any person accompanying you must be notified to the chair of the ICS in advance of the meeting. You also have the right to request any witnesses to appear before the committee and/or to provide the committee with a written statement prior to its meeting.

If the ICS is not satisfied that an offence has taken place, the student shall be informed and the matter shall end there. The chair of the ICS may also take chair's action to dismiss a case prior to any committee meeting if they judge that there is no case to answer.

If the ICS is satisfied that no offence has taken place the case should be referred back to the department for an appropriate mark, to be determined in line with their standard procedures.

If the ICS is satisfied that an offence has taken place it shall:

(a) determine the penalty and inform the secretary of the appropriate Board of Examiners and the student accordingly. See section 14.4.

(b) where the offence relates to an assessment which contributed to the previous approval of an academic award or honour to the candidate, make such recommendations to the Senate (or to the Senate Steering Committee acting on the Senate's behalf) to take such action under University Statutes, Ordinances and Regulations.
You have the right of appeal against either the decision of the ICS or the penalty. Any appeal must be submitted in writing to the Academic Registrar within 10 days of the notification of the ICS's decision to the student. Details of this appeals process can be found here: https://warwick.ac.uk/services/gov/calendar/section2/regulations/cheating/.

13.4 Penalties relating to academic misconduct

The University and The Dyson Institute takes academic misconduct very seriously and the penalties reflect this.

Penalties for academic misconduct – examinations

The maximum penalty shall not normally exceed a mark of zero in that examination paper, (if appropriate, with or without the opportunity to resit the paper).

In appropriate cases the committee shall have the power to impose a more severe penalty, it being understood that such a penalty would be imposed without prejudice to the provisions of the Disciplinary Regulations. The ICS may refer cases it considers appropriate to the University Discipline Committee, the sanctions available to the Discipline Committee including termination of the student's registration and this would mean termination of your employment at Dyson.

Penalties for academic misconduct – essays, dissertations, reports and other assessed work, not undertaken under examination

Head of Department discretionary route

In the event that it is determined that an offence has occurred, the Head of Department will determine the appropriate penalty, which shall not exceed a mark of zero in the piece of work to which the offence relates (with or without the opportunity to resubmit or undertake a further assessment). Having been informed of the penalty, you may choose either:

(i) to accept the penalty as a final decision in which case a report of the circumstances of the case and level of penalty exacted shall be lodged by the Head with the Secretary of the appropriate Board of Examiners; or

(ii) request, within 10 days of being informed by the Head of Department of the penalty, that the matter is considered by an ICS, thereby invoking procedures above, whereupon the Head shall make a report to the Academic Registrar. In exceptional circumstances the Head of Department may consider a request submitted after 10 days.

ICS route

The maximum penalty shall not normally exceed a mark of zero in which the piece of work is being assessed (with or without the opportunity to resubmit or undertake a further assessment).

In appropriate cases the committee shall have the power to impose a more severe penalty, the penalty would be imposed without prejudice to the provisions of the University Disciplinary Regulations. The ICS may refer cases it considers appropriate to the University Discipline Committee, sanctions available to the Discipline Committee including termination of the student's registration.

For awards that have already been made the ICS will make recommendations to Senate as it may consider appropriate (including that the previous academic award or honour to the candidate should be revoked).

14.0 Leaving The Dyson Institute

14.1 Exit awards and final awards

Sometimes things don't go according to plan and you might decide to leave The Dyson Institute earlier than intended. If you have successfully completed a requisite number of credits you will be eligible for an "exit award". A "final award" is the qualification you receive from The University after you have successfully completed all the required credit in your programme of study.

You will earn 90 credits per year as you progress through your degree course. The table below indicates the exit awards offered by The Institute, the minimum requirement for credit at each level for an award at what point in your academic journey you might eligible to leave.

Exit award – Qualification	FHEQ Level	Total number of credits to be taken	Total minimum credit to be passed	When you might be eligible to receive award (timings are indicative)

Certificate of Higher Education	4	120	90 credits at Level 4 or above	After term one in year two
Diploma of Higher Education	5	240	180 credits	After term two in year three
Bachelor Degree Ordinary	6	300	90 credits at Level 4 or above 150 credits **must** be at Level 5 or above 60 credits **must** be at Level 6	After term one in year four (if all modules have been passed) *You will be eligible to undertake an End Point Assessment for your Level 6 Apprenticeship
FINAL AWARDS				
Bachelor degree with Honours	6	360	60 credits at Level 4 or above 210 credits **must** be at level 5 or above 90 credits **must** be at Level 6	End of year four
*Level 6 Degree Apprenticeship (Product Design and Development Engineer)	6	300* -360	Completion and successful pass of the End Point Assessment (EPA) conducted by the Institution of Engineering and Technology (IET)	At the end of year four after your results of the degree are confirmed.

https://warwick.ac.uk/services/aro/dar/quality/az/exitawards
*You will only be enrolled on the Degree Apprenticeship if you are levy eligible. You will have been informed if you are not eligible.
https://www.instituteforapprenticeships.org/apprenticeship-standards/product-design-and-development-engineer-degree/

15.0 Glossary

Term	Explanation
Academic appeals	A request for a review of a decision of an academic body around a mark, outcome or decision.
Academic misconduct	Any action or attempted action that may result in creating an unfair academic advantage for yourself or an unfair academic advantage for anyone else.
Complaints	A specific query about an aspect of the student experience.
Concerns	Where a student makes comment (in conversation, writing or via social media) on the provision of learning opportunities made available, or for any service that the provider may offer.

Credits	Credit is awarded to a learner in recognition of the verified achievement of designated learning outcomes at a specified level. To achieve a degree, you have to successfully obtain a number of credits to show you have completed enough learning at a particular level of study.
Exit award	A formal award and record of learning from the University of Warwick that acknowledges your level of learning and credit obtained during your time at The Dyson Institute.
Extension	If you can't complete an assignment or a piece of coursework because of unforeseen circumstances, you might need to ask for a formal assignment extension request.
Framework for Higher Education Qualifications	Also known as the FHEQ – sets out the levels of learning for Higher Education. The levels represent the difficulty of the qualification, HE Entry Level 4 being the most basic and Level 8 the most advanced.
Lecture	An educational talk/presentation on a particular theme/topic or subject.
Mitigating circumstances	Exceptional unforeseen short-term circumstances which are outside your control and might adversely affect your studies or ability to complete and exam.
Seminar	Where a topic is discussed with small groups of students.
Trimester	Description for the three terms during the academic year.
Tutorial	Interactive method of teaching, that usually involves problem solving or finishing a specific task.
Workshop	Groups engage in intensive discussion on a particular topic or subject.

16.0 Appendices

16.1 Appendix A: Guide to the EDA (Dyson) Regulations

This guide has been derived from the University Regulations and the University assessment conventions. It is also the case that the requirements of the PSRBs (Professional, Statutory and Regulatory Bodies, such as the IET and IMechE) are taken into account in our progression arrangements.

To the best of our knowledge, the information is correct but if there are any errors or changes, the University Regulations take precedence.

This guide is for those who started the first year of the EDA in/after September 2017.

Overall

The EDA is a BEng Hons degree that consists of 360 credits, previously referred to as CATS (Credit Accumulation Transfer Scheme) taken over four years. There are 90 credits in each year. The 90 credits in year one are all at level 4 and the 90 in year two are at level 5. Each of the 90 credits in years three and four are at level 6.

All taught modules are 15 credits while the project taken in year four is 30 credits

To obtain an Honours degree, participants in the degree must pass all 90 credits at level 4, all 90 credits at level 5 and at least 150 credits at level 6 including the project (see below for further details).

The pass mark is normally 40%.

Year one

All modules in year one are regarded as core and must be passed to progress to year two. Anyone who has not passed all six modules (90 credits) at 40% or more by the time of the exam board in July will be given the next opportunity to resit the failed modules (usually held in the first or second week of September). These resit modules MUST be passed if the participant is to progress to the second year of the degree. Unless there are acceptable mitigating circumstances, anyone who has not passed all modules by this stage will normally be required to withdraw and will not be allowed to start the year again.

All resit modules are capped at 40% unless there are mitigating circumstances. The first-year marks do not count towards the final degree.

Year two

All modules in year two are regarded as core and must be passed to progress to year three. Anyone who has not passed all six modules (90 credits) at 40% or more by the time of the exam board in July will be given the next opportunity to resit the failed modules (usually held in the first or second week of September). These resit modules MUST be passed if the participant is to progress to the third year of the degree. Unless there are acceptable mitigating circumstances, anyone who has not passed all modules by this stage will normally be required to withdraw and will not be allowed to start the year again. These participants may be considered for an exit qualification.

All resit modules are capped at 40% unless there are mitigating circumstances. The second-year marks count 20% towards the final degree.

Years three and four

Participants should ideally pass all 10 taught modules at 40% or above across years three and four but MUST pass the project if they are to be awarded an Honours degree. However, it is still possible to obtain an Honours degree if the marks for no more than TWO of the taught modules (i.e. 30 credits) are between 30% and 39% inclusive.

A third year progress board meets in July to consider the marks of individual participants and recommend resitting of exams for any module where the mark is below 40%. Given that up to two taught modules at level 6 with marks between 30% and 39% inclusive can be condoned and counted towards the Honours degree, a participant may decide not to take this opportunity if only one or two modules taken in year three are in this range. However, this would mean that the number of modules taken in year four that could be condoned would be reduced accordingly. If a participant decided not to resit a module taken in year three, they would NOT be able to resit it a year later (i.e. after the final year board of examiners in year four). Participants are therefore strongly recommended to take the opportunity to resit when it is offered.

For modules in years three and four, if a participant has failed a module below 40%, they will be given the opportunity to resit the module. This mark will be capped at 40% but if the module is passed, will be counted towards the number of credits needed for an Honours degree.

A final year board of examiners meets in the July of the fourth year and will make a decision of the final grade based on 20% of the second year average mark and 80% of the combined year three and year four average mark. This decision may include giving individual participants the opportunity to resubmit an assignment or resit the exam of a taught module taken in year four in which case those participants would normally be considered for their degree at the next board the following summer.

Guide to the operation of exam boards and the Mitigating Circumstances Panel.

It is important to understand the processes that the department and university use to make decision on Progression (being allowed to progress from one year to the next) and on final degree classification. It is also important to know how mitigating circumstances (MC) are dealt with.

The processes used are designed to be quite robust and take up quite a bit of time. Students are often frustrated by the time it takes for us to inform them of our decisions. The intention of this note is to explain the process so that students know what is going on and can see why it may seem to take longer than they might expect.

Confidentiality of the process

It is important to understand that the deliberations of exam boards and the Mitigating Circumstances Panel are confidential and it is not permitted for any member to disclose what was discussed during the meeting.

Intermediate years (not final year)

At the end of intermediate exam boards, a decision is taken on whether a students can progress to the next year of study, or be required to withdraw or be required to resit modules that they have failed. At the end of each year, all marks are gathered together and an overall mark for each module is calculated based on the weightings of each component part (coursework and exams). The overall module marks for each module are compiled for each student. This all tends to happens in early July for an exam board that takes place in mid-July.

Before an exam board considers whether to allow a students to progress, a separate panel sits and considers mitigating circumstances.

Mitigating Circumstances Panel

The Mitigating Circumstances Panel considers any evidence that has been submitted throughout the year through the mitigating circumstances portal and makes a classification:

A = Minor and judged to have no effect on performance.
B = Moderate and could have had an effect on performance.
C = Severe and would definitely have affected performance.
(*) = Ongoing MC that should be kept on record for subsequent years.

It then looks at the student's performance and can recommend a number of things based on the MC. It may suggest no action is needed if the MC is classified as an A. Or it may, for example, recommend that a late penalty be waived if a MC has affected a certain assessment.

It can recommend that a resit be taken as a first attempt if the MC was judged to have affected the module or exam as a whole. It is important to understand that neither the MCP, nor the subsequent exam board can change the mark recorded for any module.

Exam boards

The recommendations of the MCP are recorded and passed to the exam board. Exam boards are quite formal and follow a set agenda. An external examiner is present (except for year one exam boards). The progression of each student is decided. The exam board takes into account the MCP recommendations and then makes decisions:

- Proceed to the following year
- Resit module X, Y, Z… as a final attempt
- Resit module U, V, W… as a first attempt (if there are appropriate MC)

There is a further MCP and exam board after any resits where the board can also require a student to withdraw if they have failed a module or modules that have been sat as a final attempt. These resit boards sit around the second week in September, around a week after resits have been sat.

Just to add to the complexity, first year exam boards are a little different. Currently, first year MC and exam boards are run by the faculty rather than the departments. So, the department will have an internal pre-MCP and an internal pre-board and the decisions are passed to the faculty for final decisions to be made at FYBOE (first year boards of examinations). They faculty can overrule a departmental decision. For example, it may decide that the department has been overly lenient or overly harsh on the grading of mitigating circumstances and may make a different recommendation.

Final year exam boards

The same process of MCs and exam board occurs for finalists. The only difference is that the exam board makes decisions on final degree classification. The overall (weighted) results are

calculated and a final percentage dictates the overall performance. 70% and above results in a 1st class, between 60% and 70% a 2i, etc.

The exam board can look at borderline cases and MC from all years and can decide that a student is awarded a higher classification than the overall result would normally yield if there are MC that merit such a decision. Conventions and guidelines dictate what discretion the exam board has in these cases.

The role of the external examiner

The external examiner is an independent person, from an external organisation who is paid by the university. The external examiner is present at all exam boards apart from first year and resit boards. During the year they are asked to comment on the quality and level of assessments and examinations that are set throughout the year. Prior to exam boards they are also invited to scrutinise how the exams and assessments were marked as well as how the exam boards were run.

They often ask to talk to students on the course to get their views on how the course is run. They are members of the exam board and are often asked for their input on decisions. They verbally report back to the board at the end of the process and they are required to write a formal external examiners report at the end of each year when they comment on what is described above as well as make comments on the overall course, its standards, how it compares to national benchmarks. The department makes a formal response to the external examiners report. The report is also scrutinised by the university who may comment and require additional actions.

16.2 Appendix B – examination rules

The University of Warwick regulations regarding conduct and permitted items to be taken into exams can be found here:

https://warwick.ac.uk/services/gov/calendar/section2/regulations/examregs/#10.2

1. Students are not permitted to enter an examination room until an invigilator has announced that the examination room is open. Students are advised to arrive at the examination room 20 minutes before the published start time of the examination.

2. Students are under examination conditions as soon as they enter the examination room and must not communicate with anyone other than an invigilator.

3. Students must complete and sign the attendance form.

4. Students are permitted only the following items at the examination desk:

- Student ID card: this should be placed on the top right-hand corner of the examination desk.
- Writing implements, rulers etc: these should be in a clear pencil case or bag.
- One clear container of still water: bottles should have the labels removed.

- Materials specified on the front page of the examination paper; these will have been notified by the module leader prior to the examination.
- Clear bag for personal, valuable items: such as wallets, purses, keys, mobile phones and electronic storage and retrieval devices. All mobile phones and electronic storage and retrieval devices placed in the bag must be switched off and alarms cancelled. The bag must be sealed and placed under the chair. Items must not be removed from the bag until the examination script has been collected.
- Clear bag for wrist watches: Wrist watches must be placed in the clear bag and placed on the desk.
- One bilingual dictionary: Students who are permitted to use a bilingual dictionary must ensure the dictionary is approved and stamped by their department. An invigilator will inspect the dictionary to ensure it has been approved and stamped. Any dictionary not approved and stamped will be removed for the duration of the examination.
- All other items are considered to be unauthorised materials. Students found in possession of unauthorised materials, either at the examination desk or on their person, will be reported and will face disciplinary proceedings.

5. Students who are in possession of electronic storage or retrieval devices (including smart devices), either at the examination desk or on their person, will be awarded a mark of zero for the examination. This is an absolute penalty and there is no opportunity to appeal the mark of zero.

6. Any item suspected to be a smart device will be inspected by an invigilator and may be confiscated for the duration of the examination.

7. Students may not wear any watch while they are in the examination room. Watches may be placed in the clear bag provided on the exam desk and left visible on the desk.

8. Students who are taking the examination as a first attempt and who have been awarded a mark of zero for possession of an unauthorised digital information, communication, storage and retrieval device will be given the opportunity to resit the examination at the earliest opportunity for a mark capped at the relevant pass mark. Students who are taking the examination as a resit are not eligible to a further resit attempt.

9. Students who are in possession of unauthorised materials or who are suspected of cheating will be required to stay at their desk at the end of their examination and complete a Student Incident Form. This will be sent to the Examinations Section and the procedures under Regulation 11 instigated.

10. Students must not open the examination paper or make notes until the start of the examination has been announced.

11. Students must write rough notes, calculations etc. in the answer book and cross this through to indicate to the marker that it should be disregarded.

12. Students requiring assistance should raise their hand; an invigilator will come to the desk. Students must not leave the examination desk without the permission of an invigilator.

13. Students arriving late for an examination will be permitted to enter the room up to 30 minutes after the start of the examination. No extra time will be allowed to compensate for a student's late arrival.

14. Students may not leave the examination room within the first 30 minutes or last 15 minutes of the examination.

15. During the examination, students may leave the examination room only if escorted by an invigilator. Students who leave the examination unescorted by an invigilator will not be permitted to return to the examination room.

16. Students requiring a toilet break will be escorted by an invigilator. Their answer book will be marked at the point the toilet break is taken. Only one student at a time is permitted a toilet break.

17. Any irregularities of conduct within the examination room will be reported and the invigilator may instruct a student to leave the examination room.

18. When the end of the examination is announced, students should stop writing immediately.

19. All answer books, even if they contain rough work or are blank, should be submitted.

20. Students must stay in their seats until all examination books have been collected and the invigilator has announced students may leave.

21. Students may not remove answer books or examination materials from the examination room.

Use of calculators in examinations

Use of calculators in examinations where the use of calculators is allowed, suitable models must be:
- Of a size suitable for use on a desk.
- Either battery or solar powered.

Calculators must not be adapted to offer any of these facilities:
- Language translators.
- Symbolic algebra manipulation.
- Numerical differentiation or integration.
- Communication with other machines or the internet.
- Have retrievable information stored in them, including databanks, dictionaries, mathematical formulas and text.

The candidate is responsible for the following:

- The calculator's power supply.
- Making sure their calculator meets the requirements set out.

Candidates are advised to use **CASIO FX-85 / CASIO FX-83** models of scientific calculator, which comply with the requirements above.