Course Handbook
PGCert/ PGDip/ MSc Maintenance Engineering
Options
With work placement
With Industrial placement
2020/2021
(September and January Start)
(Full time/ Part time)

Dr. Ahmed Onsy
School of Engineering

Please read this Handbook in conjunction with the University’s Student Handbook.

All course materials, including lecture notes and other additional materials related to your course and provided to you, whether electronically or in hard copy, as part of your study, are the property of (or licensed to) UCLan and MUST not be distributed, sold, published, made available to others or copied other than for your personal study use unless you have gained written permission to do so from the Dean of School. This applies to the materials in their entirety and to any part of the materials.
Contents

1 Welcome to the Course
2 Structure of the Course
3 Approaches to teaching and learning
4 Student Support
5 Assessment
6 Classification of Awards
7 Student Feedback
8 Appendices
  8.1 Programme Specification(s)
  8.2 Guide for Year long timetable
  8.3 Students Activities, Industrial Visits and International Travel
  8.4 Examples for Labs and Resources
1. Welcome to the course
Welcome to the PGCert/ PGDip/ MSc Maintenance Engineering and congratulations on being accepted on the programme.

I am delighted that you have chosen to enrol on the Maintenance Engineering programme. We will endeavour to provide you with an outstanding experience of higher education by continuously improving this course through your feedback year on year. We are aware that you have made a decision that affects your future career and we can assure you that we will work hard to meet your aspirations. However, we also expect that you will commit sufficient time and efforts to acquire and apply the knowledge and experience required to succeed in your field of study.

I trust that you will find your experience enjoyable and rewarding. In the meantime, if you have any queries or concerns, I would advise you to contact your course leader at the earliest possible opportunity.

Dr. Ahmed Onsy
Course leader for the MSc Maintenance Engineering

1.1 Rationale, aims and learning outcomes of the course
Welcome to the Master of Sciences (MSc) degree course in Maintenance Engineering. This award is a one year full time (two year part time) degree. Over the last twenty five years and more, we have educated hundreds of engineers, who now are employed, often in senior positions, in engineering organisations in the UK and throughout the world. This course is designed to equip and enable you to work as a graduate engineer through the skilled application of your knowledge of engineering. This may be in the fields of design, analysis, development, manufacture, application, sales and maintenance of high technology products, systems, and services. The course insists that you reflect on the processes that you apply that underpin engineering practice. You will need to evaluate the social, environmental and financial consequences of your actions as an engineer. We hope to provide you with an interesting and challenging engineering education.

The content of this degree reflects the requirements for professional Chartered Engineer and the course is accredited by the Institution of Engineering and Technology (IET). The current accreditation is applicable for 2012-2017. The course aimed to enhance students’ career potential, personal and professional effectiveness and performance in employment, and assist them in making a positive and sustained contribution to their wider community.

Please keep this handbook. It contains information you will need throughout your course. The handbook is intended to be a source of information on the academic and administrative aspects of the course. You will find information on the course operation, management and the assessment regulations. The structure and content of the course is described together with the assessment strategies. The full program specifications, including learning outcomes, are provided in Appendix 8.1.

Read this course handbook supplement carefully alongside the school handbook. Should there are points which you do not understand or wish to discuss further, do not hesitate to contact the Course Leader or any of your module tutors.
The aims of the programme are:

Aims of the MSc Programme
In addition to aims of the PGDip programme the MSc component will aim:

• To equip students with research skills to successfully undertake an independent academic and/or applied technological research at postgraduate level.
• To enable students to become effective reflective practitioners.
• To further enhance students’ career potential and overall employability.

Aims of the PGDip Programme
In addition to aims of the PGCert programme the PgDip component will aim:

• To further develop students' knowledge in mechanical maintenance engineering, tribology and systems integration
• To refine students’ ability to communicate in written and verbal English and to relate their communication skills to the needs of maintenance engineering and tribology sector.
• To encourage students to become reflective practitioners.
• To enhance students’ career potential, personal and professional effectiveness and employability, and assist them in making a positive and sustained contribution to their wider community.

Aims of the PGCert Programme
• To develop students' knowledge in maintenance engineering and tribology
• To provide students with a learning environment in which they will demonstrate their capacity for independent study and their capacity for critical thought and reflection.
• To refine students' ability to communicate in written English and to relate their communication skills to the needs of maintenance engineering and tribology sector
• To raise awareness of reflective practice.
• To enhance students’ career potential, personal and professional effectiveness and performance in wider community.

1.2 Course Team
The academic staff currently associated with the course is:

<table>
<thead>
<tr>
<th>Course Leader</th>
<th>Dr Ahmed Onsy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CM109</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:AOnsy@uclan.ac.uk">AOnsy@uclan.ac.uk</a></td>
</tr>
<tr>
<td></td>
<td>0177289 3266</td>
</tr>
</tbody>
</table>
Teaching Staff:

<table>
<thead>
<tr>
<th>Staff</th>
<th>Room</th>
<th>Module Leader</th>
<th>Telephone</th>
<th>Email Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Gonzalo Garcia-Atance Fatjo</td>
<td>CM221</td>
<td>MP4702</td>
<td>01772-893323</td>
<td><a href="mailto:ggarcia-atancefatjo@uclan.ac.uk">ggarcia-atancefatjo@uclan.ac.uk</a></td>
</tr>
<tr>
<td>Dr Ahmed Onsy</td>
<td>CM109</td>
<td>MP4701, MP4706, EL4166</td>
<td>01772-893266</td>
<td><a href="mailto:AOnsy@uclan.ac.uk">AOnsy@uclan.ac.uk</a></td>
</tr>
<tr>
<td>Dr Nathalie Renevier</td>
<td>CM037</td>
<td>MP4704</td>
<td>01772-893316</td>
<td><a href="mailto:NRenevier@uclan.ac.uk">NRenevier@uclan.ac.uk</a></td>
</tr>
<tr>
<td>Dr Martin Varley</td>
<td>CM134</td>
<td>EL4817</td>
<td>01772-893272</td>
<td><a href="mailto:MRVarley@uclan.ac.uk">MRVarley@uclan.ac.uk</a></td>
</tr>
<tr>
<td>Dr Aikaterini Fragaki</td>
<td>CM021</td>
<td>MP4708</td>
<td>01772-89</td>
<td><a href="mailto:AFragaki@uclan.ac.uk">AFragaki@uclan.ac.uk</a></td>
</tr>
<tr>
<td>Javad Yazdani</td>
<td>CM138</td>
<td>EL4895</td>
<td>01772-892685</td>
<td><a href="mailto:JYazdani@uclan.ac.uk">JYazdani@uclan.ac.uk</a></td>
</tr>
</tbody>
</table>

CM rooms are in Computing & Technology Building (C&T Building)

Technical Staff:

**Computing and Technology Building:**

LIS Customer Support (West Hub)
Telephone: 01772895355 (5355 from Campus)
E-mail address: LISCustomerSupport@uclan.ac.uk

**Wharf Building:**

Through Paul Critchley Wharf Building
Telephone 01772-893216
Email address: pcritchley@uclan.ac.uk
1.3 Expertise of staff

Taught course are delivered by staff from the school of Engineering that are active in both research and knowledge transfer. 

**Jost Institute** for Tribotechnology

Dr Gonzalo Garcia-Atance Fatjo. Gonzalo Garcia-Atance Fatjo is a lecturer in engineering. He is lecturing advanced materials and material selection. Gonzalo is research active within the area of tribotechnology and is a member of the Jost Institute.

Dr Ahmed Onsy is Principal Lecturer and the Academic Lead – Mechanical Engineering and Maintenance Engineering. He is your course leader. His main research interests are intelligent diagnostics and health management systems, smart maintenance systems, advanced mechatronics and embedded systems.

Dr Nathalie Renevier is a senior lecturer and course leader for the BEng (Hons) Mechanical Maintenance Engineering. She is lecturing maintenance management and is coordinating all the undergraduates’ projects. Her area of research is surface engineering (coatings, surface treatments).

Dr Hadley Brooks a lecturer in our mechanical engineering courses. He is lecturing design and operation of sustainable systems. His research interest area is in additive manufacturing.

Dr Katerina Fragaki is a Lecturer in Renewable Energy and course leader for the MSc in Renewable Energy Engineering.

Professor Ian Sherrington is Professor of Tribotechnology and Director of the Jost Institute. He contributes to mechanical systems reliability.

Professor Ted Smith is honorary professor. He contributes to mechanical systems reliability. His expertise is in Lubrication and lubrication management.
1.4 Academic Advisor
You will be assigned an Academic Advisor who will provide additional academic advice and support during the year. They will be the first point of call for many of the questions that you might have during the year. Your Academic Advisor will be able to help you with personal development, providing insight and direction to enable you to realise your potential.

1.5 Administration details
Campus Admin Services provides academic administration support for students and staff and are located in the following hubs which open from 8.45am until 5.15pm Monday to Thursday and until 4.00pm on Fridays. The hub can provide general assistance and advice regarding specific processes such as extenuating circumstances, extensions and appeals. Also, if you have any issues with Fees, module registration, please contact:

The C&T Hub (2nd Floor of the C&T building, CM235)

Computing and Technology Building
Art, Design and Fashion
Computing
Journalism, Media and Performance
Engineering
telephone: 01772 891994/891995
e-mail:CandTHub@uclan.ac.uk

Allen Building
Medicine
Dentistry
telephone: 01772 895566
e-mail:AllenHub@uclan.ac.uk

Harris Building
Lancashire Law School
Humanities and the Social Sciences
Centre for Excellence in Learning and Teaching
telephone: 01772 891996/891997
e-mail:HarrisHub@uclan.ac.uk

Foster Building
Forensic and Applied Sciences
Pharmacy and Biomedical Sciences
Psychology
Physical Sciences
telephone: 01772 891990/891991
e-mail:FosterHub@uclan.ac.uk

Course Academic advisor

<table>
<thead>
<tr>
<th>Course Academic advisor</th>
<th>Dr Ahmed Onsy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CM109</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:AOnsy@uclan.ac.uk">AOnsy@uclan.ac.uk</a></td>
</tr>
<tr>
<td></td>
<td>0177289 3266</td>
</tr>
</tbody>
</table>
1.6 Communication

The University expects you to use your UCLan email address and check regularly for messages from staff. If you send us email messages from other addresses they risk being filtered out as potential spam and discarded unread.

The course team expects you to use your UCLan email address and check regularly for messages from staff. If you send us E-mail messages from other addresses they risk being filtered out as potential spam and discarded unread. The course team use a wide variety of Student Communication Channels. UCLan will use all means of communication that enable to contact the students.

The Course Team

1- Has made available a notice board located on the first floor of the C&T building where the following information could be seen
   - Students Calendar
   - Student Assignment Calendar
   - Student academic calendar
   - Student list
   - News and events that are relevant to the course
   - Students final grades
2- Will essentially communicate through Outlook E-mail or Blackboard E-mail. UCLan address will used as a preference address whenever possible.
3- May use Personal electronic address when it is not possible to communicate with the students. Cases could include student where access rights have been removed, UCLan data system is in operational for unforeseen reasons.
4- May contact students by phone or mobile phone
5- May issue letter of recommendation, attendance or any similar request

If either student home address, email address or local address has changed during the time at the University, Student should a mend MyUclan (https://my.uclan.ac.uk/BANP/twbkwbis_P_WWWLogin).

Students should monitor their e-mails. Most E-mails would be replied within a 48h timeframe. Some members of the team are only employed part-time (2 days a week), so you may have a reply within a week.
1.7 External Examiner

The University has appointed an External Examiner to your course who helps to ensure that the standards of your course are comparable to those provided at other higher education institutions in the UK. If you wish to make contact with your External Examiner, you should do this through your Course Leader and not directly. External Examiner reports will be made available to you electronically (Blackboard Course area) (Engineering@UCLan Blackboard pages).

The School will also send a sample of student coursework to the external examiner(s) for external moderation purposes, once it has been marked and internally moderated by the course tutors. The sample will include work awarded the highest and lowest marks and awarded marks in the middle range.

Dr Ling Wang
Senior Lecturer
University of Southampton
Since 2014

2. Structure of the course

2.1 Overall structure

The course is arranged in a modular system called MODCATS (Modular Credit Accumulation and Transfer Scheme). Each module that you pass entitles you to credits that accumulate. The Academic Regulations (found on the University website) provide the framework for the award.

Students may take chose to add to the degree some industrial or work experience. It is possible to do so with successful completion of the 6 taught modules. Students who have resit during the summer will not be eligible for placement option.
Postgraduate Certificate (PGCert) in Maintenance Engineering (60 credits)

Postgraduate Diploma (PGDip) in Maintenance Engineering (120 credits)
Master of Science (MSc) in Maintenance Engineering (180 credits)

Entry Requirement mat
PGCert
MP3704 (20 credits)

Compulsory
MP4702 (20 credits)
MP4703 (20 credits)
EL4166 (20 credits)

OR
MP4706 (20 credits)
MP4708 (20 credits)
EL4817 (20 credits)

OR
MP4709 (20 credits)

Transfer Credit
PGDip Stage

IF PASS
Exit with MSc
IF FAIL
EL4895 (60 credits)

Semester 1
Semester 2
Semester 3

Master of Science (MSc) in Maintenance Engineering (180 credits) with Professional Placement (120 credits)


Compulsory
MP4701 (20 credits)
MP4702 (20 credits)
EL4166 (20 credits)

OR
MP4703 (20 credits)
MP4706 (20 credits)
MP4708 (20 credits)

OR
MP4709 (20 credits)

Option
MP4704 (20 credits)
IF NOT
EL4817 (20 credits)

2 options

Semester 1
Semester 2
Semester 3
Year Long

Entry/Transfer Stage

IF PASS
EL4895 (120 credits)
EL4895 (60 credits)
Exit with MSc with Professional placement

IF FAIL
Exit with PGDip

IF FAIL
Exit with PGDip

Exit with PGDip
Master of Science (MSc) in Maintenance Engineering (180 credits) with Work Placement (60 credits)

**Entry Requirement:** Bachelor 2.2 in Eng., Sci., Phys., PGCert

<table>
<thead>
<tr>
<th>Module*</th>
<th>Code</th>
<th>Level</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project</strong></td>
<td>MP4998 (Core)</td>
<td>7</td>
<td>60</td>
</tr>
<tr>
<td><strong>Research Methods</strong></td>
<td>EL4166 Compulsory</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td><strong>Design and operation of sustainable systems</strong></td>
<td>MP4701 Compulsory</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td><strong>Advanced materials and Materials selection</strong></td>
<td>MP4702 Compulsory</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td><strong>Choose three Modules of those options</strong>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance Management</td>
<td>MP4704 (Directed)</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Sensors, instrumentation &amp; Control</td>
<td>MP4706 (Option)</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Renewable Energy Technology</td>
<td>MP4708 (Option)</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Student initiated module</td>
<td>EL4817 (Option)</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Engineering Management Systems</td>
<td>MP4705 (Option)</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td><strong>Optional module for Placement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Students that have not taken MP3704 as part of previous studies are directed toward MP4704 (compulsory). Students that have already taken MP3704 cannot take MP4704.

University procedures for Quality Assurance (Validation and Periodic Evaluation) are found in section D of the Academic Regulations.

University procedures for Quality Assurance (Validation and Periodic Evaluation) are found in section D of the Academic Regulations.

* Note. The options will be chosen in conjunction with advice from the course leader with respect to those modules available due to consideration of School operational efficiency.

### 2.2 Modules available

Each module is a self-contained block of learning with defined aims, learning outcomes and assessment. A standard module is worth 20 credits. It equates to the learning activity expected from one sixth of a full-time undergraduate year. Modules may be developed as half or double modules with credit allocated up to a maximum of 120 credits per module.

**EL4895 - Project (Engineering):** The aim of this module is for the student to undertake a major piece of advanced level work having some significant elements of research and originality. This will require the student to specify, plan, execute and report a programme of work leading to the investigation/design of a product / system / service incorporating a number of the following activities: investigation, analysis, design, implementation / simulation, evaluation, test, manufacture, with aspects involving the study of current research or advanced developments (academic or industrial) leading to the development of new knowledge, methods or applications.

**EL4166 - Research Methods:** The aim of this module is to develop the individual skills necessary to conduct technical studies at an advanced level effectively.

**MP4701 - Design & operation of sustainable systems:** This module aims to synthesise bearing designs that minimise power loss, evaluate bearing material or coating selections that minimise friction and wear, employ ISO standards in the design of lubricant management systems, design condition-monitoring solutions of typical industrial machines based on an understanding of their performance and running characteristics, synthesise reliability and maintainability analyses of mechanical or electrical devices.

**MP4702 - Advanced materials &Materials selection:** This module aims to identify the relationships between structures and mechanical properties of engineering materials, including metals, ceramics, polymers and composites; understand types of material failure including, fast fracture, fatigue, creep, and corrosion and oxidation, be familiar with design with materials, including modulus-limited design, yield-limited design, fatigue design and creep-limited design; to understand criteria for materials selection.

**MP4705 - Engineering Management Systems:** This module examines the main methods for developing sustainable engineering programme for industrial plants. It provides a comprehensive understanding of theory and practice of sustainable systems engineering strategies to achieve high plant efficiency, optimise on product quality, and address safety and environmental issues. In completion of the module you should demonstrate ability to apply and contrast theoretical knowledge of sustainable engineering, demonstrate ability to apply...
knowledge of Energy and Waste management in industrial plants, demonstrate ability to apply the knowledge of Health and Safety management, plan and manage a small to medium sized multi-partner maintenance project to its successful conclusion.

**MP4706 - Sensors, instrumentation & Control:** The aim of this module is to introduce methods of computer interfacing of industrial or scientific instruments and data processing for monitoring and control of engineering processes, to provide students with a sound understanding of the use of advanced instrumentation and sensing methods, to apply signal processing methods and system design methods.

**EL4817 - Student initiated module full module:** The aim of this module is to enhance the student's ability to work independently, to provide an opportunity for the investigation of a topic of particular interest to the student, to enhance the student's skills in report writing and critical evaluation, to enhance the ability to evaluate the results of an investigation.

**MP4708 - Renewable Energy Technology:** The aims of this module are to provide students with Engineering knowledge of various renewable energy technologies; Scientific understanding of the contributions which the renewable sources can make, the technologies used to harness them and limitation associated with their uses; Practical skills in developing renewable energy projects.

**MP4704 - Maintenance Management Strategy:** This module examines the main methods for developing a modern maintenance programme for industrial plants. It provides a comprehensive understanding of theory and practice of reliability centred maintenance and total productive maintenance strategies to achieve high plant availability, optimise on product quality, and address safety and environmental issues. The module will also consider shutdown and turnaround within maintenance of complex systems.

**EL4101 Professional Placement (Engineering):** This module allows students to develop an understanding of the professional practices associated with working in the engineering industry. Students will research, secure and undertake a period of work experience or industrial placement in an organisation appropriate to the field of study. The placement period should normally cover a minimum of 38 weeks full-time throughout the course of the module and a maximum of 40 weeks. Subject to negotiation with tutors, the placement might extend across more than one organisation. Students will be expected to reflect upon this work experience critically and to apply their experience to theoretical and conceptual elements of their course.

**EL4102 Work Placement (Engineering):** This module allows students to develop an understanding of the professional practices associated with working in engineering. Students will research, secure and undertake a period of work experience or industrial placement in an organisation appropriate to the field of study. The placement period should normally cover a minimum of 10 weeks full-time throughout the course of the module and a maximum of 15 weeks. Subject to negotiation with tutors, the placement might extend across more than one organisation. Students will be expected to reflect upon this work experience critically and to apply their experience to theoretical and conceptual elements of their course.

Students that wish to apply for position such as Maintenance Engineers – Technicians/Engineers who conduct maintenance of systems, plants, fleets etc. Those students would need knowledge of how to diagnose faults and restore function in complex items. Those students would be oriented toward MP4706 – Sensors, instrumentation & Control and EL4817 - Student initiated module full module to complement modelling/diagnostic requirements.

Students that wish to apply for position such as Maintenance Managers should consider management options. Those students would be oriented toward MP3704 – Maintenance
Management, MP4705 – Engineering Management Systems and EL4817 - Student initiated module full module to complement maintenance operation requirements (designing and modelling the maintenance operation, managing contracts, managing people, supplier chain design/operation and maintenance planning)

Support Engineers positions have not been yet considered but will be considered in the near future– An aviation classification that refers to the people who look at supportability, maintainability, reliability, testability and the design of support systems and services. But those students would be oriented toward EL4817 - Student initiated module full module to extend their maintenance Management knowledge in the maintenance areas of modelling and simulation.

The course team reserve the right to run or not the modules pending student’s numbers.

➢ **Elective modules**

Free-Choice Elective modules enable you to develop skills such as a language or acquire knowledge outside your main subject(s). You can make your choice from a selection of modules that are delivered across many subject areas from the [Electives Catalogue](http://www.uclan.ac.uk/international/).

In addition to the course modules, international students are strongly advised to take free elective English for Engineers (Module code). Additional English support has been proven to enable student to improve students’ academic writing. This is particularly true for assessments such as examination. Grades will appear on your transcript but are not part of this degree.

If you are an International student you will find the following link useful:

[http://www.uclan.ac.uk/international/](http://www.uclan.ac.uk/international/)

➢ **Accreditation of Prior Learning (APL)**

If you consider that you may have already achieved some of the learning outcomes of the course through previous learning, please consult your course leader and gain advice from the APL Coordinator to find out whether you can make a claim for [accreditation of prior learning](http://www.uclan.ac.uk/international/) for part of your course.

### 2.3 Course requirements

Specific course requirements that will affect your final award, core/compulsory and option modules and placements or field trip activities are detailed in your course supplement. Some of these ‘course requirement’ may be set by the professional body that accredits your course and may take precedence over the University’s Academic Regulations, these, where applicable, can be found in the course supplement – so please familiarise yourself with them and ask your course leader for further clarification if required.

This MSc course is accredited by IET, The Institution of Engineering and Technology. More information about IET can be found in the link:

[http://www.theiet.org/about/](http://www.theiet.org/about/)

More information about IET Accreditation can be found in the link:


The benefits of picking an IET accredited course can be found in the link:

[http://www.theiet.org/students/studying-engineering/choosing-course/accredited-course.cfm](http://www.theiet.org/students/studying-engineering/choosing-course/accredited-course.cfm)
As a student undertaking this course, you are bound by the Code of Conduct as specified by IET and subject to the UCLan procedure for the consideration of Fitness to Practise.

2.4 Module Registration Options
Discussions about your progression through the course normally take place in February and in May each year after the exams. It is an opportunity for you to make plans for your study over the rest of the course. These discussions are with both the Academic advisor and the Course Leader.

Discussions about a student’s progress may take place, when needed, between the student and the student’s Academic Advisor. These are additional opportunities to identify whether a student feels capable of completing the course of study and gets advice on the extra support available.

2.5 Study Time
2.5.1 Weekly timetable
A timetable will be available once you have enrolled on the programme, through the student portal.

2.5.2 Expected hours of study
20 credits is a standard module size and equals 200 notional learning hours. The normal amount of work involved in achieving a successful outcome to your studies is to study for 10 hours per each credit you need to achieve – this includes attendance at UCLan and time spent in private study. You will typically have 4 hours timetabled per module per week and are therefore expected to do another 8-12 hours self-organised study. Often you will be working in groups for practical work and you should try and arrange to meet up outside the scheduled class times. You will also need to use equipment such as computer and laboratory facilities for practical work, again sometimes outside the scheduled class times. If you struggle with self-study skills, please speak to Course Leader.

In order to get most out of the lectures/labs the students are advised to read the material covered soon after the lecture/lab and identify points for further reading. For the specific hours of study required for each module, please refer to the module descriptor which will be provided by the module leader.

2.5.3 Attendance Requirements
You are required to attend all timetabled learning activities for each module. Notification of illness or exceptional requests for leave of absence must be made to C&T Hub: CandTHubAttendance@uclan.ac.uk Tel. (01772) 891994 / 1995

Your attendance at lectures, seminars and labs is taken very seriously by staff in your course – we expect you to be there! In the School we have an electronic Student Attendance Monitoring System, and you will be contacted if your attendance falls below our expectation. Class registers are taken (using barcode scanners), and it is your responsibility to make sure that you bring your card and are marked as present. All register marks are entered into our electronic student tracking system and checked by staff regularly. The Attendance Monitoring Team will email or phone you, and ask you to discuss your progress with Course Leader. If you are experiencing genuine
difficulties which are making it difficult to attend, we will do our utmost to support and advise you. Notification of illness or exceptional requests for leave of absence must be made to the Dean of School or nominee (usually the Course Leader). Students may also contact CandTHub@uclan.ac.uk to report illness (subject of the E-mail must contain Student Id number, student name and report of illness).

If you have not gained the required authorisation for leave of absence, do not respond to communications from the University, and if you are absent for four weeks or more, you may be deemed to have withdrawn from the course. If this is the case, then the date of withdrawal will be recorded as the last day of attendance.

Students who do not respond to communications concerning continuous unauthorised absence may be deemed to have withdrawn from the course. The date of withdrawal will be recorded as the last day of recorded attendance.

Students are expected to turn up at all scheduled classes; staff are there at that time for your benefit. If Students cannot attend for a particular reason, it is important that you inform your course leaser and module tutor of your non-attendance, and the reason, in advance. In previous years, it has been consistently found that poor attendance is linked to poor results.

Lecturers will monitor your attendance, and you will be able to access your attendance record through myUCLan. If you are not re-engaging with course leader, you may be referred to the Engineering Retention officer and/or Fresh Start support. The University will attempt to contact non-attendees by various means (E-mail, Phone/mobile phone and letter) before withdrawing students from their programme of study. In other words, if students want to continue at the University to the end of the course, it is a good plan to turn up whenever students are required.

If students wish to see a member of staff at a time other than scheduled classes, either drop in or make an appointment in person, by ‘phone or by email. Staff generally enjoy teaching or they wouldn’t be in the job so they are keen to see students. However students must recognise that they are busy people and students may have to wait for a suitable time slot for an appointment. Lecturers’ availability timetable can be seen on the board outside their office or on Blackboard under useful contacts.

Attendance for international students enrolled under the Points-Based System (also known as PBS). The PBS system affects all students who are a non-EEA/EU/Swiss national. Under PBS institutions must be registered with the UK Border Agency in order to recruit international students. UCLan is a registered sponsor and has been awarded an 'A' rating; this is the highest rating available. As a registered sponsor, UCLan has several responsibilities to fulfil, including monitoring the attendance of international students holding a PBS visa and reporting non-attendance, failure to enrol and withdrawals to the UK Border Agency. UCLan is obliged to tell UKBA if you withdraw from a course, defer or suspend your studies, or if you fail to attend the course regularly.

Each time you are asked to enter your details on SAM you must remember that the University has a responsibility to keep information up to date and that you must only enter your own details on the system. To enter any other names would result in inaccurate records and be dishonest. Any student who is found to make false entries can be disciplined under the student guide to regulations.

Out of term work
During Christmas and Easter holidays students may need to study for the exams or prepare their coursework. It is in the responsibility of the students to ensure that they stay within
Meeting during the MSc Project

MSc project takes place during the summer. Students are required to have weekly meetings with the supervisor. This means that the student meets the supervisor in person to discuss the progress and future work. These meetings are compulsory and should take place even in case the student feels that no progress has been achieved since the last meeting. Students should be aware that many members of staff may take some holidays, or attend conferences during the summer months. There should be an agreement between the student and the supervisor on how the student will handle the project while the supervisor is away.

Students are expected to stay within accessible distance to the University campus so that they can use the University facilities and attend the project meetings. They are not normally expected to take holidays during the summer; if this happens, it has to be in agreement with both the supervisor of the project, and the course leader, and the duration of the holidays should not exceed 7 working days in total.

3. Approaches to teaching and learning

3.1 Expertise of staff

Taught modules are delivered by staff from the school of Engineering that are active in both research and knowledge transfer or working within the Jost Institute for Technology who are experts in various aspects of Maintenance Engineering. Information about the teaching staff and their area of expertise can be found above in section 1.3 or on their webpage.

3.2 Learning and teaching methods

Students may have great difficulty in becoming independent learners. Indeed students may initially not have a clear understanding of this concept. This may be particularly problematic if students are used to having a highly structured timetable and suddenly find that they have to manage their own time. High dependence on teachers in the past may make them feel totally lost in their new environment. As a result, students may need quite a high level of guidance and support in order to develop the skills required of independent learners. This is particularly relevant for international students who will experience cultural shock at the beginning of the course. Several mechanisms are in place to cater for specific needs.

Students are expected to access through UCLan Blackboard and study reading materials prior to sessions and adopt pro-active attitude during the given sessions.

There is a wide variety of teaching and learning methods, they include:

- Lectures/classes: offer information, literature review and illustrative application and present and explore core ideas in the subject. A student prepares solutions to questions on an examples sheet, which will be discussed in a class. This provides a student with the opportunity to follow-up the lectures with first self-study and then group discussion to deepen their individual knowledge of the topic.

- Practical sessions: computational methods are taught as a series of computer-based practical with short introductory lectures on theory. This enables a student to understand issues in application of computational methods to simulated and real problems and also develop computing skills relevant to the rest of the course including the research project.
Practical computer-based and experimental lab based, provide an opportunity for a student to consolidate the theory they have learned in lectures with practical experience. Group project: provides an opportunity to study a real mechanical and tribological engineering problem in depth, practice analytic and problem-solving skills, and work in a team.

Individual project: involves a literature review, problem specification and experiments/analysis written up in a report. This enables a student to demonstrate that they can apply the knowledge they have acquired on different aspects of the course to a mechanical and tribological engineering problem in some depth as well as put into practice general research skills.

Student led presentation: involves a self-directed study and preparation of and participation in student-led project presentations.

In addition:
- Expert (guest) lectures or seminars: provide a student with the opportunity to hear internal speakers and external speakers from industry. This enables a student to gain appreciation of some applications, needs and roles of maintenance engineers as well as career opportunities.
- Students' activities, industrial visits and international Travel, see Appendix 8.3.

3.3 Study skills

The course Team is committed to helping you develop the necessary study skills for success but this relies on your motivation and desire to develop and improve your skills. One of the most important study skills to develop is reading the feedback from your assignments and acting on it to improve your future work. So make sure that when you receive any feedback, develop an action plan and keep it handy to refer back to when you write your next piece of work.

All of our academic staff are able to support you in the development of your academic writing skills and you should discuss these with Course Leader and/or module leaders.

Please see your Study Skills Handbook for detailed support in the development of study skills.

There are a variety of services to support students and these include
http://www.palgrave.com/skills4study/index.asp
WISER https://www.uclan.ac.uk/students/study/wiser/index.php
LIS https://www.uclan.ac.uk/students/study/

Study Skills - ‘Ask Your Librarian’
https://www.uclan.ac.uk/students/support/study/it_library_trainer.php

You can book a one to one session with a subject Librarian via Starfish. These sessions will help with questions such as "My lecturer says I need a wider variety of sources in my references, what do I do?"
"I need to find research articles, where do I start?"
"How do I find the Journal of ...?"
"How do I use RefWorks?"
3.3 Learning resources
3.3.1 Learning and Information Services (LIS)
The best place to start when exploring the Library resources available to you is:
- Your ‘Subject Guide’ can be found in the Library Resources
- Your ‘My Library’ tab in the Student Portal
- Library search

Your module reading list – this can be found in your electronic module space. Generic information is included in the Student Handbook, but you may wish to include additional information here. How does LIS provide resources and support particularly relevant for this course, such as subject guides or access to on-line databases? Please contact your subject liaison officer if you’d like more information to add here.

3.4.2 Electronic Resources
LIS provide access to a huge range of electronic resources – e-journals and databases, e-books, images and texts.

In addition PGCert/ PGDip/ MSc Maintenance Engineering course information and the modules teaching materials will be available through Blackboard.

Each module has the link to a reading list accessible through blackboard or through external link [http://readinglists.central-lancashire.ac.uk/index.html](http://readinglists.central-lancashire.ac.uk/index.html)

**Using Blackboard**
Blackboard is the brand name for the on-line Virtual Learning Environment (VLE) that UCLan has implemented to support and enhance teaching and learning. Once you have logged on to the UCLan network you can go to the Blackboard web page. This will take you straight into Blackboard where you will find:
- The school of Engineering
- The course
- Modules you are enrolled on.

Your Course leader will assure at the start of the year that you are able to navigate through blackboard. If you have difficulties, please speak to Dr. Ahmed Onsy.

3.4.3 Additional Resources
In addition to the LIS resources, there are specific labs available for the course, see Appendix 8.4 for Examples for Labs and Resources.

<table>
<thead>
<tr>
<th>Lab</th>
<th>Location</th>
<th>Booking in advance</th>
<th>Risk Assessment</th>
<th>Lab Manager @uclan.ac.uk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jost Institute for Tribology Micro-Lab</td>
<td>CM039</td>
<td>Yes. Available for lab works and PG/UG Project</td>
<td>Yes. Risk Assessment, COSHH</td>
<td>Dr Nathalie Renevier Email: NRenevier</td>
</tr>
<tr>
<td>Intelligent Machine / Condition Monitoring</td>
<td>CM144</td>
<td>Yes. Available for lab works and PG/UG Project</td>
<td>Yes. Risk assessment form to be filled and approved</td>
<td>Dr. Ahmed Onsy Email: AOnsy</td>
</tr>
</tbody>
</table>
3.5 Personal development planning

During the time at University Students will develop a distinctive body of knowledge and understanding within the Mechanical Maintenance Engineering discipline, as well as the generic skills and intellectual abilities which will help as student progress through the course and into student chosen career.

It may seem a little soon to begin thinking about your career as you start your programme of study but if you leave it until the final term, it will be too late – increasingly employers want to be assured that students can apply the learning acquired at university to their job role as this survey shows. In addition, students may be thinking of going on a placement.

Q: What do employers want from their University entrants?
A: The same skills that make good students:
- Willingness to Learn
- Commitment
- Dependability/Reliability
- Self-motivation
- Team-work
- Oral communication skills
- Co-operation
- Written communication skills
- Drive/Energy
- Self-management
- Desire to achieve/Motivation
- Problem solving ability

[Source: Harvey, L. and Green, D. 1995 Employer Satisfaction: Summary, QHE Project, University of Central England]

The students are supplied with a self-assessment form Personal Development Planning booklet highlighting a number of skills and provide students with a continuing opportunity to assess student’s strength in them as the programme progresses through the year. The ability to self-assess is a skill in itself. It is worth remembering that developing skills through extra-curricular activities is valued by prospective employers, especially when it is combined in a balanced way with your academic studies.

The PDP programme for Maintenance Engineering has been built on the PDP programme for the Maintenance Engineering which involves a number of tasks and scheduled meetings.

Scheduled arrangements with course leader; this is usually embedded in the usual scheduled meeting time, but you can arrange to see your Academic advisor at any time if a problem arises. Your Academic advisor will make sure that you have filled out the self-assessment form in a serious way, and he/she will give feedback. Remember that your course leader is with you for your entire degree programme and will be responsible for writing letters of support/references for any job applications you might make, at any stage of your time at UCLan.
The UCLan Skills web site is a good starting point for help with developing many of the skills covered in this Personal Development Plan – www.Uclan.ac.uk/wiser. If you need help:
- With study skills, visit the following UCLan web site: www.Uclan.ac.uk/wiser
- To develop your IT skills, visit the following UCLan web site: www.uclan.ac.uk/LIS

The UCLan Library web site is also a helpful resource – www.uclan.ac.uk/LIS

The UCLan Library web site is also a helpful resource – www.uclan.ac.uk/LIS

The Students’ Union - http://www.uclansu.co.uk/ - offers courses throughout the year to help students develop skills. Project is the Unions’ personal and professional development programme for its members. Essentially it is short, fun and interactive bite sized chunks of information presented by students for students.

WISER offers an programme to all students covering things like essay writing and thesis writing – www.Uclan.ac.uk/wiser

We recommend the following texts:

3.6 Preparing for your career

Your future is important to us, so to make sure that you achieve your full potential whilst at university and beyond, your course has been designed with employability learning integrated into it at every level. This is not extra to your degree, but an important part of it which will help you to show future employers just how valuable your degree is. These “Employability Essentials” take you on a journey of development that will help you to write your own personal story of your time at university:

• To begin with, you will explore your identity, your likes and dislikes, the things that are important to you and what you want to get out of life.
• Later, you will investigate a range of options including jobs and work experience, postgraduate study and self-employment.
• You will then be ready to learn how to successfully tackle the recruitment process. You will be able to record your journey using Pebblepad, the university’s e-portfolio system, which will leave you with a permanent record of all the fantastic things you have achieved during your time at UCLan. It’s your future: take charge of it!

Careers offer a range of support for you including:-

• Career and employability advice and guidance
• Access to work placements, internships, voluntary opportunities, part-time employment and live projects
• Workshops, seminars, modules, certificates and events to develop your skills
• Business start-up, freelance and self-employment advice

Daily drop in service available from 09:00-17:00 for CV checks and initial careers information. For more information come along and visit the team (in Foster building near the main entrance) or access our careers and employability resources via the Student Portal.

The students will be introduced to national schemes such as Knowledge Transfer partnership. The scheme has raised career opportunities and prospects to thousands of students in the UK.

The MSc Maintenance Engineering programme is building on your first degree in a scientific or engineering or technology subject and will provide students with the necessary skills to become an innovative maintenance engineer or manager, sustainable designer engineer, maintenance Manager, operations manager or supply chain manager. You may join small or large organisations in a wide variety of industrial sectors incl. nuclear, aerospace, automotive, and pharmaceutical.

Modules such as design and operation of sustainable systems, maintenance management and sustainable systems development are particularly relevant to meet the future environmental challenges and fulfil the current industrial needs (On 27/05/2010, there was over 800 maintenance manager positions, on 03/08/2012, there was over 1200 maintenance
manager positions and on 15/07/2013, there was over 1800 maintenance manager positions and on 16/07/2015 there was over 21,000 positions on jobsite.co.uk).

### Careers Sites and Resources

- **The UClan careers site:** [http://www.uclan.ac.uk/students/employability/futures/index.php](http://www.uclan.ac.uk/students/employability/futures/index.php)
- **Prospects Directory:** [http://www.prospects.ac.uk](http://www.prospects.ac.uk)
- **Graduate Careers Directory:** [http://www.hobsons.com](http://www.hobsons.com)
- **Hobsons Casebooks - Finance, Science and IT:** [http://www.hobsons.com](http://www.hobsons.com)
- **GTI Career Journals - City and Finance, IT:** [http://www.doctorjob.co.uk](http://www.doctorjob.co.uk)

### Agencies

- **Web:** [http://www.rec.uk.com](http://www.rec.uk.com) also [http://www.jobreserve.com](http://www.jobreserve.com)
- **Academic**
  - In the UK: [http://www.jobs.ac.uk](http://www.jobs.ac.uk)
  - In the US: [http://www.ams.org](http://www.ams.org)

4. **Student Support**

Information on the support available is at: [https://www.uclan.ac.uk/students/](https://www.uclan.ac.uk/students/)

Students are supported in many ways by the school and the course team. Students need to be aware of the support available to them.

This includes:
- Dr. Ahmed Onsy
- The C&T Hub
- The I
- Student Liaison officer Tutor.

The 'I' is the central Student Information Centre and your first point of contact. You can obtain information on a wide range of topics including student administration such as Council Tax and letters to verify your status plus Scholarships, Counselling, Student Finance, Mentoring, Studying Abroad, Disability Advice, Independent Academic Advice, International Advice, Multi Faith Centre, Pre School Centre, Medical Centre and general life in Preston. Student Support and Well Being Officers have recent experience of what it is like to be a student and can advise you of the support systems available. They work towards improving your student experience at UCLan, more information about their role can be found at the "I"
4.1 Academic Advisors

The role of academic advisors should be distinguished from that of academic tutors. The latter are involved with supporting students on individual modules, whereas the role of academic advisors involves advice and support provided to the student across the programme and extends to personal difficulties such as accommodation, financial difficulties and sickness. However, it is possible that an academic advisor will also be one of the student’s academic tutors.

The course Leader will act as an academic advisor at the first instance. Dr. Ahmed Onsy may be able to liaise with other UCLan services or direct the student to appropriate supports. Dr. Ahmed Onsy will mentor and coach student in the creation of a personal development planning portfolio. Weekly workshop between students will be organised around essentials skills PDP portfolio available through Blackboard.

The students are expected to reflect on topics that have been covered the previous week or signposted towards others UCLan services (WISER, Career ...). The general topics include: Self-Management Skills, Communication Skills, Written Communication Skills, Numeracy Skills, Career Management Skills, Presentation Skills, Selling and Negotiation Skills, Group Work, Leadership and Personal Skills, Information Gathering and Research Skills, Thinking Skills, Consultancy / Self Employment Skills, Exam and Test Skills, Reflective Skills and Personal Development Planning, ICT Skills.

There will be time that students want to discuss personal matters; therefore one to one meeting will take place.

4.2 Students with disabilities

If you have a disability that may affect your studies, please either contact the Disability Advisory Service -disability@uclan.ac.uk- or let one of the course team know as soon as possible. With your agreement information will be passed on to the Disability Advisory Service. The University will make reasonable adjustments to accommodate your needs and to provide appropriate support for you to complete your study successfully. Where necessary, you will be asked for evidence to help identify appropriate adjustments.

Assessment arrangements for students with a disability

Arrangements are made for students who have a disability/learning difficulty for which valid supporting evidence can be made available. Contact the Disability Adviser for advice and information, disability@uclan.ac.uk.

Dr. Javad Yazdani is the lead for students with disabilities within the school.

Room: C&T Building CM138
Telephone: 01772-892685
E-Mail: JYazdani@uclan.ac.uk

4.3 Students’ Union

The Students’ Union offers thousands of volunteering opportunities ranging from representative to other leadership roles. We also advertise paid work and employ student staff on a variety of roles. You can find out more information on our website: http://www.uclansu.co.uk/

4.4 Health and Safety

As a student of the University you are responsible for the safety of yourself and for that of others around you. You must understand and follow all the regulations and safety codes necessary for a safe campus environment. Please help to keep it safe by reporting any incidents, accidents or potentially unsafe situations to a member of staff as soon as possible.

Safety assessments have been undertaken for each module of your course and you will be advised of all applicable safety codes and any specific safety issues during the induction to
your course and modules. You must ensure that you understand and apply all necessary safety codes. These form an essential element of your personal development and contribute to the safety of others.

When using equipment from the Jost Institute for tribotechnology Labs located in CM038, CM039 (C&T building) or WB (Warf building), students will be trained to use and apply safety codes while working in engineering environment.

4.5 Conduct

You will be expected to abide by the Regulations for the Conduct of Students in the University. UCLan expects you to behave in a respectful manner demonstrated by using appropriate language in class, and switching mobile phones / other devices off prior to attending classes.

If your behaviour is considered to be unacceptable, any course team member is able to issue an informal oral warning and the University will support staff by invoking formal procedures where necessary. You can read more about UCLan expectations in the regulations for the Conduct of Students.

Students in the course are expected to arrive on time to attend classes. You may be prevented to enter a classroom or laboratory if you arrive late without authorisation.
5. Assessment

5.1 Assessment Strategy

Please note that all modules will be assessed. You are expected to attempt all required assessments for each module for which you are registered, and to do so at the times scheduled unless authorised extensions, special arrangements for disability, or extenuating circumstances allow you to defer your assessment. Assessment is typically done through both coursework/assignments and exams with the weightings reflecting the course content.

Each assessment is designed to help you address one or more of the 'Learning Outcomes' (LOs) of the module that you are studying. The brief will tell you which LOs you are to address. These LOs combine to form the LOs of the course that you are on; the details of this can be found in your course’s Programme Specification (Appendix 8.1). You need to use the feedback that you get on assessments to help you improve your grades.

Grading of modules:

As a general rule, at level 7 (PGDip and MSc level), there is an assessment threshold requirement of 40% for each assessed coursework, with a module pass mark of 50%. Apart from the formative assessment, assessment of some coursework may be summative.

Moderation and assessment boards:

All work that you submit for assessment is marked and then a suitable sample is double marked or moderated by a second person, either before the work is returned to you or the work will be taken back off you again for moderation after you have seen the feedback. Copies of the feedback we give are kept on file for external examiners and assessors to look at. When the module is over the marks are compiled into a final mark and these go to a formal ‘module board’ for consideration and approval. Your overall marks (‘profile’) are then considered by a course / subject board and decisions reached about degree results, reassessments and so on. All marks you may have been given should to be treated as provisional until confirmed by the assessment boards at the end of the academic year as they may be changed. For more details about rules, regulations and assessment boards, please see the Academic Regulations, Assessment Handbook or consult your course leader.

External Examiner:

An important element of the quality assurance procedure is the External Examiner. This is a person appointed by the University to oversee the courses. Typically they look at exam papers when they are set and comment on them, look at student work at the end of the year and sit in on exam boards, particularly when final results are being decided upon. They may also visit mid-year. They send a report to the University on what they think of our courses; these reports are scrutinised at several levels in the University and any necessary actions are taken.

5.2 Notification of assignments and examination arrangements

Students will be provided with an assessment timetable at the beginning of the course to allow student to manage their time. The calendar is made available through Blackboard and on the board located on the first floor adjacent to course leader office.

Assessment of modules typically involves the submission of coursework during the year, and an end examination. For each assignment, the Assignment Specification informs you how and when the work is to be submitted. Do not regard the hand-in date as the target date for completing the work. Instead, complete the coursework before the hand-in date to allow a ‘margin of safety’ in case of technical problems.

Coursework are mainly submitted through blackboard but occasionally you may have some assignment with paper submission (Project report or course work). When there is a paper submission, coursework is usually collected in ‘assignment boxes’ located on the first floor of
CM Building. Be sure to sign and attach an 'Assignment Submission Form'. Ensure you keep a copy of your work.

Students usually submit their coursework through Blackboard as directed by the module tutor. Your Module Leader / Tutor will supply clear guidelines on the submission method (paper or Blackboard), examination arrangement. Some module tutor choose to have deadline at 16:00, some would prefer at 12:00, students must be aware that this is very much up to the Module Leader / Tutor.

Unless the coursework explicitly states that you may work in groups, you must assume that anything you may submit for assessment to be entirely your own work, with material you have consulted properly referenced. This is not meant to stop you discussing in general terms how to tackle problems, but you must demonstrate individually that you understand the work and can solve the details of the problem yourself.

Students will be made aware of the marking criteria prior the assessment within the assignment brief.

BY SUBMITTING THIS WORK STUDENTS CONFIRM THAT THIS IS THEIR OWN WORK

Results
Results will be posted to your Permanent Address; they are also available on 'myUCLan': https://my.uclan.ac.uk. It is your responsibility to check results and results cannot be given out by phone. Resit examinations (where permitted) will be held in a week around the end of August. Coursework re-assessments will be posted to your Permanent Address and will normally be due around that period also. Make sure that your Permanent Address is correct on https://my.uclan.ac.uk or you may not receive them,

Failures and Reassessment
If a piece of work is awarded a fail grade, normally nothing is done until after the appropriate exam board, since this does not always mean that the module has been failed. If a module has been failed then your overall performance on the year is considered before a decision is reached on whether you can be reassessed in that module. The decision to offer reassessment to you is at the discretion of the assessment board. If you are offered reassessment it is important that you seek counselling from the Course Team as soon as the results are published. You will then be able to discuss the requirements with the appropriate academic member of staff.

5.3 Referencing
Students are expected to be aware of the need for appropriate referencing and familiar with the system used in their own field. Every reference in the list should enable the reader to identify the work cited and to locate the specific passage referenced. There are different ways of listing references in a bibliography but you should be consistent once you have decided on your method. WISER supply a number of helpful guides and resources online: www.uclan.ac.uk/wiser

5.4 Confidential material
In the cases where Engineering students might use confidential information they should take guidance from their module tutor on the ethical and legal responsibilities to respect confidentiality and maintain anonymity of individuals within their assignments. In the case where a student completes a dissertation or project that contains sensitive information it is important to complete the assignment within the deadlines. The assessment (such as,
presentation and report) should deal with the confidential information in a manner that allows the student to complete the assessment within the specified deadlines.

5.5 Cheating, plagiarism, collusion or re-presentation

Please refer to the information included in section 6.6 of the University Student Handbook for full definitions. The University uses an online Assessment Tool called Turnitin. A pseudo-Turnitin assignment will be set up using the School space on Blackboard to allow students to check as many drafts as the system allows before their final submission to the ‘official’ Turnitin assignment. Students are required to self-submit their own assignment on Turnitin and will be given access to the Originality Reports arising from each submission. In operating Turnitin, Schools must take steps to ensure that the University’s requirement for all summative assessment to be marked anonymously is not undermined and therefore Turnitin reports should either be anonymised or considered separately from marking. Turnitin may also be used to assist with plagiarism detection and collusion, where there is suspicion about individual piece(s) of work.

You are required to sign a declaration indicating that individual work submitted for an assessment is your own.

If you attempt to influence the standard of the award you obtain through cheating, plagiarism or collusion, it will be considered as a serious academic and disciplinary offence as described within the Academic Regulations: G7 and the Assessment Handbook.

• Cheating is any deliberate attempt to deceive and covers a range of offences described in the Assessment Handbook.

• Plagiarism describes copying from the works of another person without suitably attributing the published or unpublished works of others. This means that all quotes, ideas, opinions, music and images should be acknowledged and referenced within your assignments.

• Collusion is an attempt to deceive the examiners by disguising the true authorship of an assignment by copying, or imitating in close detail another student’s work - this includes with the other student’s consent and also when 2 or more students divide the elements of an assignment amongst themselves and copy one another’s answers. It does not include the normal situation in which you learn from your peers and share ideas, as this generates the knowledge and understanding necessary for each individual to independently undertake an assignment; nor should it be confused with group work on an assignment which is specifically authorised in the assignment brief.

• Re-presentation is an attempt to gain credit twice for the same piece of work.

UCLAN TAKES SERIOUSLY CHEATING, PLAGIARISM AND COLLUSION

BE AWARE

You may find also information

- Blackboard PGCert/PGDip/MSc Maintenance Engineering (Induction Week material)

All students need to know about plagiarism can be found at http://learning.londonmet.ac.uk/TLTC/learnhigher/Plagiarism/index.html

Additional material could be found in Wiser www.uclan.ac.uk/wiser. Students should enrol to Blackboard Wiser - WISER Study Skills Workshops were they could find a wide range of information about Unfair Means to Enhance Performance:

The ‘i’ website is also signposting a podcast in English and Chinese (http://www.uclan.ac.uk/students/study/library/the_i.php).

The animation available on the The Alternative Guide to UCLan (TAG) website provide complementary information.
Furthermore, UCLan Unit has made available TurnitinUK, a web service that enables staff to carry out electronic comparison of students’ work against electronic sources including other students’ work (collusion). It can help detect plagiarism by comparing submitted papers to billions of pages of content located on the internet and their own proprietary databases. The results of the comparisons are displayed in custom “Originality Reports” which are easily accessed by lecturers logging into their Turnitin account. Turnitin (or any other such software) can only detect non-originality in the submitted work. That detection is followed up by an investigation to determine whether plagiarism and academic misconduct has actually occurred. Turnitin is used as part of an integrated plagiarism deterrence approach that includes student education about the nature and consequences of plagiarism, and careful thought about the design of assessments that don’t encourage plagiarism.

TURNITIN CAN DETECT 100% COLLUSION AND 40-60% PLAGIARISM

The software has been available to student through Blackboard, students should refer to the induction booklet and case studies for further information.

**Turnitin Test**

Typical Turnitin Report

Blue = 0% detected, Green = detection between 1% and 24%, Yellow = detection between 25% and 49%, Orange = detection between 50% and 74%, Red = detection between 75% and 100%.

Students with an orange or red detection in the originality report are likely to be referred for an Unfair Means to Enhance Performance hearing.

Students with a yellow detection in the originality report may also be referred for an Unfair Means to Enhance Performance hearing, but report with yellow detection cold contain as part of the assignment a large number of references and citations. In Engineering, it is likely to be considered as Unfair Means to Enhance Performance.

Students with a green detection in the originality report signifies that the software has detected a relatively low level of information from sources. This could come from properly referenced information, unreferenced information, and coincidental information. The academics may investigate further and use other means of detection.
Students with a blue detection in the originality report signifies that the software has not detected information in relation to Unfair Means to Enhance Performance. The academics may use other means of detection.

The process of investigation and penalties which will be applied can be reviewed in the Assessment Handbook, section 5. If an allegation is found to be proven then the appropriate penalty will be implemented:

In the case of a single offence of cheating, plagiarism or collusion:
• The penalty will be 0% for the element of assessment, and an overall fail for the module.
• The plagiarised element of assessment must be resubmitted to the required standard and the mark for the module following resubmission will be restricted to the minimum pass mark (ie 40% for levels 4, 5 and 6 work, 50% for level 7 work).
• When it is detected for the first time on a resubmission for an already failed module, no further resubmission for the module will be permitted, and the appropriate fail grade will be awarded.

In the event of a repeat offence of cheating, plagiarism or collusion (irrespective of whether the repeat offence involves the same form of unfair means) on the same or any other module within the course:
• The appropriate penalty will be 0% for the module with no opportunity for re-assessment. This penalty does not preclude you being able to retake the module in a subsequent year.
• The penalties will apply if you transfer from one UCLan course to another during your period of study and module credits gained on the former course are transferred to the current course.

Contact the Students’ Union Advice and Representation Centre by emailing: suadvice@uclan.ac.uk for support and guidance.

5.6 How do I know that my assessed work had been marked fairly?

Assessment is an integral part of the course. Module staff work closely together to design assessments, agree the marking criteria and approve final versions of assessments to ensure that these are appropriate. The criteria for assessment will be communicated to you clearly during the module teaching.

All module staff engage in development and training in assessment, marking and feedback. Once the assessments have been completed the module team will discuss the assessment methods and marking criteria, prior to starting to mark, so that there is a common understanding of what is expected of students. All assessed modules have moderation built into the marking process. Moderation involves sampling students’ assessed work to make sure that the learning outcomes and agreed marking criteria have been interpreted and applied in the same way. This ensures that you and your fellow students are treated equitably and that the academic standards are applied consistently. During the marking process the module leader will co-ordinate moderation to ensure that at least 10% of assessed work (or a minimum of three pieces) has been reviewed by other markers and any concerns about consistency or accuracy addressed with the whole module team. Your work may or may not be part of this sample, but the processes for developing assessments and marking criteria as well as moderation mean that you can be confident that teaching staff are marking assessments to the same criteria. Module teams may then use feedback from moderation to improve clarity about the nature and purpose of future assessment, or to make changes if required.

Modules are also moderated externally. The module leader will arrange for the external examiner to receive a sample of work for review and comment. External examiners cannot
change individual grades but can act as ‘critical friends’ and confirm that marking standards are in line with other, similar courses in the sector. If, on reviewing the sample, external examiners feel that the marking criteria have not been applied consistently the work of the whole cohort will be reviewed.

6. Classification of Awards
The University publishes the principles underpinning the way in which awards and results are decided in Academic Regulations. Decisions about the overall classification of awards are made by Assessment Boards through the application of the academic and relevant course regulations.

7. Student Feedback
You can play an important part in the process of improving the quality of this course through the feedback you give.

We encourage students to provide constructive feedback throughout their time at university, through course reps, surveys and any other appropriate means. In addition to the ongoing discussion with the course team throughout the year, there are a range of mechanisms for you to feedback about your experience of teaching and learning. We aim to respond to your feedback and let you know of our plans for improvement.

The Students’ Union and University work closely together to ensure that the student voice is heard in all matters of student-life. The Students’ Union can support you in voicing your opinion, provide on-going advice and support, and encourage your involvement in all feedback opportunities.

7.1 Student Staff Liaison Committee meetings (SSLCs)
Details of the Protocol for the operation of SSLCs is included in section 8.2 of the University Student Handbook.

Course Representatives
A course representative is a student who represents their fellow students’ views and opinions to the course team, school, university and students’ union. Course representatives work proactively and diplomatically to improve the academic and non-academic experiences of students.

The role of a course representative is extremely beneficial to both students on your course and the university. It enables students to have ownership of their student experience and voice their opinions and share positive practice with the course team, primarily the Student Staff Liaison Committee Meetings.

Course representatives will be elected every year either in September. Alongside receiving recognition, support and respect being a course representative is a great opportunity to enhance your employability skills. If you are interested in becoming a course representative and wish to find out more about the role simply contact the Students’ Union Advice and Representation Centre by emailing: coursereps@uclan.ac.uk.

SSLC meeting
The purpose of a SSLC meeting is to provide the opportunity for course representatives to feedback to staff about the course, the overall student experience and to inform developments which will improve future courses. These meetings are normally scheduled once per semester.

Meetings will be facilitated using guidelines and a record of the meeting will be provided with any decisions and / or responses made and / or actions taken as a result of the discussions held. The meetings include discussion of items forwarded by course representatives, normally...
related to the following agenda items (dependent on time of year).

The course team encourage student feedback in all areas and recognise that additional items for discussion may also be raised at the meeting
• Update on actions completed since the last meeting
• Feedback about the previous year – discussion of external examiner’s report; outcomes of National/UCLan student surveys.
• Review of enrolment / induction experience;
• Course organisation and management (from each individual year group, and the course overall);
• Experience of modules - teaching, assessment, feedback;
• Experience of academic support which may include e.g. Personal Development Planning, academic advisor arrangements;
• Other aspects of University life relevant to student experience e.g. learning resources, IT, library;
• Any other issues raised by students or staff.
Refer to Student Handbook attached for further information.
8. Appendices

8.1 Programme Specification(s)

---

**Programme Specification**

This Programme Specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided.

<table>
<thead>
<tr>
<th>1. Awarding Institution / Body</th>
<th>University of Central Lancashire</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Teaching Institution and Location of Delivery</td>
<td>University of Central Lancashire (Preston Campus)</td>
</tr>
<tr>
<td>3. University School/Centre</td>
<td>School of Engineering</td>
</tr>
</tbody>
</table>
| 5. Title of Final Award | MSc Maintenance Engineering
MSc Maintenance Engineering with professional placement
MSc Maintenance Engineering with work placement
PGDip Maintenance Engineering
PGCert Maintenance Engineering |
| 6. Modes of Attendance offered | Full time / Part time |
| 7. UCAS Code | |
| 8. Relevant Subject Benchmarking Group(s) | Mechanical Engineering, Material Science |
| 9. Other external influences | QAA IET, Engineering Chartered Institute, SOE |
| 10. Date of production/revision of this form | February 2013
Last updated July 2017 |
| 11. Aims of the Programme | |

11.1 Aims of the MSc Programme

In additional to aims of the PGDip (in §11.2) programme the MSc component will aim:

- To equip students with research skills to successfully undertake an independent academic and/or applied technological research at postgraduate level.
- To enable students to become effective reflective practitioners.
- To further enhance students’ career potential and overall employability.
11.2 Aims of the PGDip Programme
In addition to aims of the PGCert (in §11.3) programme the PgDip component will aim:

- To further develop students' knowledge in mechanical maintenance engineering, tribology and systems integration
- To refine students' ability to communicate in written and verbal English and to relate their communication skills to the needs of maintenance engineering and tribology sector.
- To encourage students to become reflective practitioners.
- To enhance students' career potential, personal and professional effectiveness and employability, and assist them in making a positive and sustained contribution to their wider community.

11.3 Aims of the PGCert Programme

- To develop students' knowledge in maintenance engineering and tribology
- To provide students with a learning environment in which they will demonstrate their capacity for independent study and their capacity for critical thought and reflection.
- To refine students’ ability to communicate in written English and to relate their communication skills to the needs of maintenance engineering and tribology sector.
- To raise awareness of reflective practice.
- To enhance students' career potential, personal and professional effectiveness and performance in wider community.

12. Learning Outcomes, Teaching, Learning and Assessment Methods

A. Knowledge and Understanding

A1. Apply and critically evaluate principles, practices and tools for the design, analysis and evaluation of sustainable and tribological engineering systems
A2. Apply and critically evaluate principles, practices and tools for the selection, analysis and evaluation of materials and surface engineering in mechanical and tribological applications
A3. Assess and critically evaluate tools for maintenance management and control/monitoring of sustainable mechanical engineering systems.
A4. Critical understanding of wider issues relating to sustainable engineering, tribology and maintenance Management

Teaching and Learning Methods

Lectures/classes: offer information, literature review and illustrative application and present and explore core ideas in the subject. A student prepares solutions to questions on an examples sheet, which will be discussed in a class. This provides a student with the opportunity to follow-up the lectures with first self-study and then group discussion to deepen their individual knowledge of the topic.

Research skills classes: research skills are taught in classes, principally involving group activities, with some preparation and post class assignments. These are in support of general skill development and to support the group and research projects in particular.

Practical sessions: computational methods are taught as a series of computer-based practicals with short introductory lectures on theory. This enables a student to understand issues in application of computational methods to simulated and real problems and also develop computing skills relevant to the rest of the course including the research project. Practicals, computer-based and experimental lab based, provide an opportunity for a student to consolidate the theory they have learned in lectures with practical experience.

Group project: provides an opportunity to study a real mechanical and tribological engineering problem in depth, practice analytic and problem-solving skills, and work in a team.

Individual project: involves a literature review, problem specification and experiments/analysis written up in a report. This enables a student to demonstrate that they can apply the knowledge they have acquired on different aspects of the course to a mechanical and tribological engineering problem in some depth as well as put into practice general research skills.

In addition:

Expert (guest) lectures or seminars: provide a student with the opportunity to hear internal speakers and external speakers from industry. This enables a student to gain appreciation of some applications, needs and roles of maintenance engineers as well as career opportunities.

Assessment methods

A variety of assessments including assignment and project reports, presentations and examinations thoroughly test the students’ knowledge and understanding of the subjects and their ability to apply that knowledge.

B. Subject-specific skills
| B1. | Select and use specialised software for the selection/development and analysis/evaluation of sustainable and tribological engineering system. |
| B2. | Specify, Plan, Manage an engineering project or solution to a problem within guidelines and documents. (Specific for MSc Award) |
| B3. | Demonstrate a professional approach to wider engineering issues relevant to a sustainable and tribological engineering related project. |
| B4. | Demonstrate Extensive knowledge and understanding of management and business practices tools used in the maintenance field, their limitations, and how these tools may be applied appropriately |

**Teaching and Learning Methods**

*Lectures/classes:* offer information, literature review and illustrative application and present and explore core ideas in the subject. A student will apply intellectual skills to prepare solutions to examples sheet questions which will be discussed in class.

*Practical sessions:* computational methods are taught as a series of computer-based practicals with short introductory lectures on theory. This enables a student to understand issues in application of computational methods to simulated and real problems and also develop computing skills relevant to the rest of the course including the research project. Practicals, computer-based and experimental lab based, provide an opportunity for a student to consolidate the theory they have learned about in lectures and apply it to problems.

*Group project:* provides an opportunity to study a real sustainable mechanical and tribology engineering problem in depth, practice analytic and problem-solving skills, and work in a team.

*Individual project:* involves a literature review, problem specification and experiments/analysis written up in a report. This enables a student to practice the application of techniques they have learned about to an engineering problem in some depth as well as put into practice general research skills.

**Assessment methods**

A variety of assessments including assignment and project reports, presentations and examinations thoroughly test the students’ knowledge and understanding of the subjects and their ability to apply that knowledge.

**C. Thinking Skills**

e.g.

*C1.* Select and apply appropriate techniques to solve a given problem. read, critique and discuss scientific article. Present a written argument based on reading from a variety of sources

*C2.* Critically assess new products and materials used in the maintenance field.

*C3.* Recognise the broader aspects of engineering and place solutions to problems in a business, environmental and industrial context

**Teaching and Learning Methods**

*Lectures/classes:* offer information, literature review and illustrative application and present and explore core ideas in the subject. A student will apply intellectual skills to prepare solutions to examples sheet questions which will be discussed in class.

*Practical sessions:* computational methods are taught as a series of computer-based practicals with short introductory lectures on theory. This enables a student to understand issues in application of computational methods to simulated and real problems and also develop computing skills relevant to the rest of the course including the research project. Practicals, computer-based and experimental lab based, provide an opportunity for a student to consolidate the theory they have learned about in lectures and apply it to problems.

*Group project:* provides an opportunity to study a real sustainable mechanical and tribology engineering problem in depth, practice analytic and problem-solving skills, and work in a team.

*Individual project:* involves a literature review, problem specification and experiments/analysis written up in a report. This enables a student to practice the application of techniques they have learned about to an engineering problem in some depth as well as put into practice general research skills.

**Assessment methods**

A variety of assessments including, written examinations, written essay assignments, Group project report and team presentation, Individual project report and short presentation/viva.

**D. Other skills relevant to employability and personal development**

*D1.* Communicate effectively through writing and oral presentation to a diverse audience.

*D2.* Locate, use, and critically evaluate information from a number of sources (including IT based sources)

*D3.* Learn and work independently and become reflective practitioners. (Specific for PGDip and MSc Award)

*D4.* Demonstrate teamwork and interpersonal skills
Teaching and Learning Methods

**Lectures/classes:** offer information, literature review and illustrative application and present and explore core ideas in the subject. A student will prepare solutions to problems set in an examples sheet, which will be discussed in a class. This provides a student with the opportunity to follow-up the lectures with first self-study and then group discussion to deepen their individual knowledge of the topic.

**Practical sessions:** Computational methods will be taught as a series of computer-based practicals with short introductory lectures on theory. This enables a student to understand issues in application of computational methods to simulated and real problems and also develop computing skills relevant to the rest of the course including the research project. Practicals, computer-based and experimental lab based, will provide an opportunity for a student to consolidate the theory they have learned about in lectures with practical experience.

**Group project:** provides an opportunity to study a real sustainable mechanical and tribological engineering problem in depth, practice analytic and problem-solving skills, and work in a team.

**Individual project:** involves a literature review, problem specification and experiments/analysis written up in a report. This enables a student to apply knowledge developed on the course practice to a engineering problem in some depth as well as put into practice general research skills.

**Student led presentation:** involves a self directed study and preparation of and participation in student-led project presentations.

Assessment methods

A variety of assessments including, group project presentations, Masters Project report and presentation thoroughly test the students' ability to apply these other skills.

### 13. Programme Structures*

<table>
<thead>
<tr>
<th>Level</th>
<th>Module Code</th>
<th>Module Title</th>
<th>Credit rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 7</td>
<td>EL4895 (Core)</td>
<td>Project (Engineering)</td>
<td>60</td>
</tr>
</tbody>
</table>

| Level 7 | MP4701 (COMP) | Design & operation of sustainable systems | 20 |
| Level 7 | MP4702 (COMP) | Advanced materials & materials selection | 20 |
| Level 7 | EL4166 (COMP) | Research methods | 20 |
| Level 7 | OR SC4107 (COMP) | Research methodology and project management | 20 |
| Level 7 | Option modules (Choose three of the following modules) | | |
| Level 7 | MP4705 (Option) | Engineering management systems | 20 |
| Level 7 | MP4706 (Option) | Sensors, instrumentation & control | 20 |
| Level 7 | EL4817 (Option) | Student initiated module full module) | 20 |

### 14. Awards and Credits*

**Master of Science with professional placement in Maintenance Engineering**
Requires 9 module passes (180 credits) at level 7 plus successful completion of EL4101

**Master of Science with work placement in Maintenance Engineering**
Requires 9 module passes (180 credits) at level 7 plus successful completion of EL4102

**Masters Degree Maintenance Engineering**
Requires 180 credits at level 6 or above with a minimum of 160 credits at level 7.
For the award of Distinction overall APM of 70% or above must be achieved including 70% or above in Master Project.
For the award of Merit overall APM of 60% or above must be achieved including 60% or above in Master Project.

**Postgraduate Diploma Maintenance Engineering**
Requires 120 credits at level 6 or above with a minimum of 100 credits at level 7.
Postgraduate Diploma is normally a target award for students who do not wish to carry out a project.

Postgraduate Certificate Maintenance Engineering
Requires 60 credits at level 6 or above with a minimum of 40 credits at level 7. MP4701, MP4702, and any optional module.

Students pursuing Chartered Engineering status would need 60 credits at level 7 (ie MP4701, MP4702 and MP4705)

Students are directed toward MP4704.

15. Personal Development Planning

Personal Development Planning (PDP) is:
- Reflection on learning, performance, and achievement
- Planning for personal, educational, and career development.

PDP can improve student capacity to understand what and how they are learning; and to review, plan, and take responsibility for their own learning. It will help students to gain a holistic overview of their studies, by reflection and a pro-active approach. It applies to student academic study, extra-curricular pursuits, and career planning. Student Personal Tutor will be able to give more focused attention to personal particular needs.

Student will be introduced to PDP during induction week activities, and will have completed some work in preparation for the first meeting with Personal Tutor. A wide range of material that will constitute the PDP portfolio is available through Blackboard (E-Learn). PDP will form the focus of student regular (once per month) meeting, but can be raised at any other occasion.

Student portfolio work in PDP is assessed but not graded and feedback is provided to students. Students are encouraged to recognise that learning is a lifelong process, and that the time at University will be enhanced by planning and recording. There are many similarities to work-based learning, and Continued Professional Development (CPD) - which is required for membership of professional societies. The skills in PDP are key components of employability – self-reflection, recording, target setting, action planning and monitoring.

Web based materials relevant to PDP are found at:
- Personal Development Planning http://www.uclan.ac.uk/information/services/ldu/pdp/index.php
- Skills Learning Resources http://www.uclan.ac.uk/information/services/ldu/pdp/skills_learning_resources.php

There is much information available from other sources, which student can locate using a web search engine.

16. Admissions criteria

Programme Specifications include minimum entry requirements, including academic qualifications, together with appropriate experience and skills required for entry to study. These criteria may be expressed as a range rather than a specific grade. Amendments to entry requirements may have been made after these documents were published and you should consult the University’s website for the most up to date information.

Students will be informed of their personal minimum entry criteria in their offer letter.

Specific entry requirements for a MSc in Maintenance Engineering degree are:
Entry can be made to the course through holding at least a lower second class award of BEng (Hons) or BSc (Hons) in Mechanical Engineering, Material Sciences or other related subject.
Applications from individuals with non-standard qualifications or relevant work / life experience who can demonstrate the ability to cope with and benefit from Master-level studies are welcome. If you have not studied recently you may need to undertake a Top-Up degree Entry programme first.
Access qualifications should normally be in a Mechanical Engineering subject or a related area.

Students whose first language is not English will be required to demonstrate competence in the language. The normal minimum standard required is IELTS 6.5 or equivalent.

17. Key sources of information about the programme

University web site (www.uclan.ac.uk), Factsheet
School website www.uclan.ac.uk/scitech/computing_engineering_physical/index.php
• Course Leader Maintenance Engineering, [www.uclan.ac.uk/scitech/jost/msc.php](http://www.uclan.ac.uk/scitech/jost/msc.php)
• Admissions tutor
### 18. Curriculum Skills Map

Please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

<table>
<thead>
<tr>
<th>Level</th>
<th>Module Code</th>
<th>Module Title</th>
<th>Core (C), Compulsory (COMP) or Option (O)</th>
<th>Programme Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Knowledge and understanding</td>
</tr>
<tr>
<td>Masters Degree Maintenance Engineering</td>
<td></td>
<td></td>
<td></td>
<td>A1</td>
</tr>
<tr>
<td>LEVEL 7</td>
<td>EL4895</td>
<td>Project (Engineering)</td>
<td>Core</td>
<td>(X)</td>
</tr>
<tr>
<td></td>
<td>EL4166</td>
<td>Research Methods</td>
<td>COMPulsory</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>SC4107</td>
<td>Research Methodology and Project management</td>
<td>COMPulsory</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>MP4701</td>
<td>Design &amp; operation of sustainable systems</td>
<td>COMPulsory</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>MP4702</td>
<td>Advanced materials &amp; materials selection</td>
<td>COMPulsory</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>EL4817</td>
<td>Student initiated module (full module)</td>
<td>Option</td>
<td>(X)</td>
</tr>
<tr>
<td></td>
<td>MP4704</td>
<td>Maintenance management strategy</td>
<td>Option</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>MP4705</td>
<td>Engineering management systems</td>
<td>Option</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>MP4706</td>
<td>Sensors, instrumentation &amp; Control</td>
<td>Option</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>MP4708</td>
<td>Renewable energy technology</td>
<td>Option</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>EL4101</td>
<td>Professional Placement (Engineering)</td>
<td>Option</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>EL4102</td>
<td>Work Placement (Engineering)</td>
<td>O</td>
<td>X</td>
</tr>
</tbody>
</table>

**Note 1:** (X) Relevant depending on project title

**Note 2:** Learning outcome B2 for MSc only
<table>
<thead>
<tr>
<th>Level</th>
<th>Module Code</th>
<th>Module Title</th>
<th>Core (C), Compulsory (COMP) or Option (O)</th>
<th>Programme Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A1  A2  A3  A4  B1  B2  B3  B4  C1  C2  C3  D1  D2  D3  D4</td>
</tr>
<tr>
<td>LEVEL 7</td>
<td>EL4166</td>
<td>Research Methods</td>
<td>COMPulsory</td>
<td>X X X X X X X X</td>
</tr>
<tr>
<td></td>
<td>SC4107</td>
<td>Research Methodology and Project management</td>
<td>COMPulsory</td>
<td>X X X X X X</td>
</tr>
<tr>
<td></td>
<td>MP4701</td>
<td>Design &amp; operation of sustainable systems</td>
<td>COMPulsory</td>
<td>X X X X X X</td>
</tr>
<tr>
<td></td>
<td>MP4702</td>
<td>Advanced materials &amp; materials selection</td>
<td>COMPulsory</td>
<td>X X X X X X</td>
</tr>
<tr>
<td></td>
<td>EL4817</td>
<td>Student initiated module (full module)</td>
<td>Option</td>
<td>(X) (X) (X) (X) (X) (X) (X) (X) (X)</td>
</tr>
<tr>
<td></td>
<td>MP4704</td>
<td>Maintenance management strategy</td>
<td>Option</td>
<td>X X X X X X X X</td>
</tr>
<tr>
<td></td>
<td>MP4705</td>
<td>Sustainable systems development</td>
<td>Option</td>
<td>X X X X X X X X</td>
</tr>
<tr>
<td></td>
<td>MP4706</td>
<td>Sensors, instrumentation &amp; Control</td>
<td>Option</td>
<td>X X X X X X X X</td>
</tr>
<tr>
<td></td>
<td>MP4708</td>
<td>Renewable energy technology</td>
<td>Option</td>
<td>X X X X</td>
</tr>
</tbody>
</table>

**Note 3:** Learning outcome D3 for MSc and PGDip only.
<table>
<thead>
<tr>
<th>Level</th>
<th>Module Code</th>
<th>Module Title</th>
<th>Core (C), Compulsory (COMP) or Option (O)</th>
<th>Programme Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEVEL 7</td>
<td>MP4701</td>
<td>Design &amp; operation of sustainable systems</td>
<td>COMPulsory</td>
<td>A1 A2 A3 A4 B1 B2 B3 B4 C1 C2 C3 D1 D2 D3 D4</td>
</tr>
<tr>
<td></td>
<td>MP4702</td>
<td>Advanced materials &amp; materials selection</td>
<td>COMPulsory</td>
<td>X X X</td>
</tr>
<tr>
<td></td>
<td>MP4704</td>
<td>Maintenance management strategy</td>
<td>Option</td>
<td>X X</td>
</tr>
<tr>
<td></td>
<td>MP4705</td>
<td>Sustainable systems development</td>
<td>Option</td>
<td>X X X</td>
</tr>
<tr>
<td></td>
<td>MP4708</td>
<td>Renewable energy technology</td>
<td>Option</td>
<td>X</td>
</tr>
</tbody>
</table>

**Note 4:** MP4706 and EL4817 options are not offered for PGCert.

**Note 5:** Mapping to other external frameworks, e.g. professional/statutory bodies, will be included within Student Course Handbooks

A1. Apply and evaluate principles, practices and tools for the design, analysis and evaluation of sustainable and tribological engineering systems in the context of maintenance
A2. Apply and evaluate principles, practices and tools for the selection, analysis and evaluation of materials and surface engineering in mechanical applications in the context of maintenance
A3. Assess and evaluate tools for maintenance management and control/monitoring of sustainable mechanical engineering systems.
A4. Critical understanding of wider issues relating to sustainable engineering, tribology and maintenance Management
B1. Select and use specialised software for the selection/development and analysis/evaluation of sustainable and tribological engineering system.
B2. Specify, Plan, Manage an engineering project or solution to a problem within guidelines and documentations.
B3. Demonstrate a professional approach to wider engineering issues relevant to maintenance related project.
B4. Demonstrate Extensive knowledge and understanding of management and business practices tools used in the maintenance field, their limitations, and how these tools may be applied appropriately
C1. Critical analysis: Select and apply appropriate techniques to solve a given problem. read, critique and discuss scientific article. Present a written argument based on reading from a variety of sources.
C2. Critically assess new products and materials used in the maintenance field.
C3. Context: Recognise the broader aspects of engineering and place solutions to problems in a business, environmental and industrial context
D1. Communicate effectively through writing and oral presentation to a diverse audience.
D2. Locate, use, and critically evaluate information from a number of sources (including IT based sources)
D3. Learn and work independently and become reflective practitioners.
D4. Demonstrate teamwork and interpersonal skills
### 8.2 Guide for Year long timetable

**MSc Full Time (12-16 months)**

<table>
<thead>
<tr>
<th>September Entry point</th>
<th>January Entry point</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sep 2017-Jan 2018</strong></td>
<td><strong>Jan 2018-May 2018</strong></td>
</tr>
<tr>
<td>Compulsory modules</td>
<td>Compulsory module</td>
</tr>
<tr>
<td>MP4702: Advanced</td>
<td>MP4701 - Design</td>
</tr>
<tr>
<td>materials and</td>
<td>and operation of</td>
</tr>
<tr>
<td>Materials selection</td>
<td>sustainable systems</td>
</tr>
<tr>
<td>EL4166 - Research</td>
<td></td>
</tr>
<tr>
<td>Methods</td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td></td>
</tr>
<tr>
<td>EL4817 – Student Lead Module</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td></td>
</tr>
<tr>
<td>MP4708 - Renewable</td>
<td></td>
</tr>
<tr>
<td>Energy Technology</td>
<td></td>
</tr>
<tr>
<td>MP4705 - Engineering</td>
<td></td>
</tr>
<tr>
<td>Management Systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Jan 2018 -May 2018</strong></td>
<td><strong>Sep 2018-Jan 2019</strong></td>
</tr>
<tr>
<td>Compulsory module</td>
<td>Compulsory modules</td>
</tr>
<tr>
<td>MP4701: Design</td>
<td>MP4702 - Advanced</td>
</tr>
<tr>
<td>and operation of</td>
<td>materials and</td>
</tr>
<tr>
<td>sustainable systems</td>
<td>Materials selection</td>
</tr>
<tr>
<td>Option</td>
<td>EL4166 - Research</td>
</tr>
<tr>
<td>MP4706 - Sensors,</td>
<td>Methods</td>
</tr>
<tr>
<td>Instrumentation and</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td></td>
</tr>
<tr>
<td>EL4817 – Student Lead Module</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td></td>
</tr>
<tr>
<td>Directed Module</td>
<td></td>
</tr>
<tr>
<td>MP4704 - Maintenance</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>May 2018-Aug 2018</strong></td>
<td><strong>Jan 2019-May 2019</strong></td>
</tr>
<tr>
<td>Core</td>
<td>Core</td>
</tr>
<tr>
<td>EL4895 – ProjectModule</td>
<td>EL4895 – ProjectModule</td>
</tr>
</tbody>
</table>
## MSc Part Time (24-30 months)

<table>
<thead>
<tr>
<th>September Entry point</th>
<th>January Entry point</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sep 2017-Jan 2018</strong></td>
<td><strong>Compulsory modules</strong></td>
</tr>
<tr>
<td></td>
<td>MP4702: Advanced materials and Materials selection</td>
</tr>
<tr>
<td></td>
<td>EL4166 - Research Methods</td>
</tr>
<tr>
<td><strong>Jan 2018-May 2018</strong></td>
<td><strong>Directed Module</strong></td>
</tr>
<tr>
<td></td>
<td>Maintenance Management Strategy</td>
</tr>
<tr>
<td><strong>Sep 2018-Jan 2019</strong></td>
<td><strong>Option</strong></td>
</tr>
<tr>
<td></td>
<td>MP4708 - Renewable Energy Technology</td>
</tr>
<tr>
<td></td>
<td>MP4705 - Engineering Management Systems</td>
</tr>
<tr>
<td><strong>Jan 2019-May 2019</strong></td>
<td><strong>Compulsory module</strong></td>
</tr>
<tr>
<td></td>
<td>MP4701: Design and operation of sustainable systems</td>
</tr>
<tr>
<td></td>
<td><strong>Options</strong></td>
</tr>
<tr>
<td></td>
<td>MP4706 - Sensors, Instrumentation and Control</td>
</tr>
<tr>
<td><strong>May 2019-Aug 2019</strong></td>
<td><strong>Core</strong></td>
</tr>
<tr>
<td></td>
<td>EL4895 – Project Module</td>
</tr>
</tbody>
</table>
# MSc Full Time with Professional placement (24-30 months)

<table>
<thead>
<tr>
<th>September Entry point</th>
<th>January Entry point</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sep 2017 - Jan 2018</strong></td>
<td><strong>Jan 2018 - May 2018</strong></td>
</tr>
<tr>
<td><strong>Compulsory modules</strong></td>
<td><strong>Compulsory module</strong></td>
</tr>
<tr>
<td>MP4702 - Advanced materials and Materials selection</td>
<td>MP4701 - Design and operation of sustainable systems</td>
</tr>
<tr>
<td>EL4166 - Research Methods or SC4107 - Research Methods and Project Management</td>
<td>Options</td>
</tr>
<tr>
<td>MP4706 - Sensors, Instrumentation and Control</td>
<td><strong>Options</strong></td>
</tr>
<tr>
<td><strong>Sep 2018 - Jan 2019</strong></td>
<td><strong>Sep 2018 - Jan 2019</strong></td>
</tr>
<tr>
<td><strong>Compulsory module</strong></td>
<td><strong>Compulsory modules</strong></td>
</tr>
<tr>
<td>MP4701 - Design and operation of sustainable systems</td>
<td>MP4702 - Advanced materials and Materials selection</td>
</tr>
<tr>
<td>Options</td>
<td>EL4166 - Research Methods or SC4107 - Research Methods and Project Management</td>
</tr>
<tr>
<td>MP4706 - Sensors, Instrumentation and Control</td>
<td><strong>Options</strong></td>
</tr>
<tr>
<td><strong>Sep 2018 - May 2019</strong></td>
<td><strong>May 2019 - Aug 2019</strong></td>
</tr>
<tr>
<td><strong>Directed Module</strong></td>
<td><strong>Option</strong></td>
</tr>
<tr>
<td>MP4704 - Maintenance Management</td>
<td>EL4101: Profession Placement (Engineering)</td>
</tr>
<tr>
<td><strong>May 2019 - Aug 2019</strong></td>
<td><strong>Jan 2020 - May 2020</strong></td>
</tr>
<tr>
<td><strong>Core</strong></td>
<td><strong>Core</strong></td>
</tr>
<tr>
<td>EL4895 - ProjectModule</td>
<td>EL4895 – ProjectModule</td>
</tr>
</tbody>
</table>
### MSc Full Time with Work Placement (3-months)

<table>
<thead>
<tr>
<th>September Entry point</th>
<th>January Entry point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 2017 - Jan 2018</td>
<td>Jan 2018 - May 2018</td>
</tr>
<tr>
<td>Compulsory modules</td>
<td>Thursday</td>
</tr>
<tr>
<td>MP4702: Advanced</td>
<td></td>
</tr>
<tr>
<td>materials and</td>
<td></td>
</tr>
<tr>
<td>Materials selection</td>
<td></td>
</tr>
<tr>
<td>EL4166 - Research</td>
<td></td>
</tr>
<tr>
<td>Methods or SC4107 -</td>
<td></td>
</tr>
<tr>
<td>Research Methods and</td>
<td></td>
</tr>
<tr>
<td>Project Management</td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td></td>
</tr>
<tr>
<td>EL4817 – Student Lead Module</td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td></td>
</tr>
<tr>
<td>MP4708 - Renewable</td>
<td></td>
</tr>
<tr>
<td>Energy Technology</td>
<td></td>
</tr>
<tr>
<td>MP4705 - Engineering</td>
<td></td>
</tr>
<tr>
<td>Management Systems</td>
<td></td>
</tr>
<tr>
<td>Direct Module</td>
<td></td>
</tr>
<tr>
<td>MP4704 - Maintenance</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td></td>
</tr>
<tr>
<td>Compulsory module</td>
<td></td>
</tr>
<tr>
<td>MP4701 - Design and</td>
<td></td>
</tr>
<tr>
<td>operation of</td>
<td></td>
</tr>
<tr>
<td>sustainable systems</td>
<td></td>
</tr>
<tr>
<td>Options</td>
<td></td>
</tr>
<tr>
<td>MP4706 - Sensors,</td>
<td></td>
</tr>
<tr>
<td>Instrumentation and</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td></td>
</tr>
<tr>
<td>EL4817 – Student Lead Module</td>
<td></td>
</tr>
<tr>
<td>Direct Module</td>
<td></td>
</tr>
<tr>
<td>MP4704 - Maintenance</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td></td>
</tr>
<tr>
<td>MP4708 - Renewable</td>
<td></td>
</tr>
<tr>
<td>Energy Technology</td>
<td></td>
</tr>
<tr>
<td>MP4705 - Engineering</td>
<td></td>
</tr>
<tr>
<td>Management Systems</td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td></td>
</tr>
<tr>
<td>EL4102: Work Placement (Engineering)</td>
<td></td>
</tr>
</tbody>
</table>

| May 2018 - Sep 2018   | Jan 2019 - May 2019 |
| Core                  |                     |
| EL4895 – ProjectModule|                     |

| Sep 2018 - Jan 2019   | May 2019 - Sep 2019 |
| Core                  |                     |
| EL4895 – ProjectModule|                     |
8.3 Students Activities, Industrial Visits and International Travel

2015-2016 Engineering Summer CPD Activities and MSc Maintenance Engineering Students

2016-2017 MSc Maintenance Engineering Students visit to Cyprus and UCLan campus in Cyprus

8.4 Examples for Labs and Resource