

# **School of Engineering**



## **MSc Sustainable Energy Systems**

**2024/2025**

### **Programme Information**

**Dr. Brian Sellar  
Programme Director**

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# 1 Introduction

## 1.1 The Purpose of this Handbook

This handbook is a guide to the requirements and procedures relevant to your MSc programme, as well as to the support available to you. Much of the information provided here was already presented in the welcome talk at the start of the year and its associated slides, but additional information is given here on Semester 2 and how preparation for Dissertations fit within the program.

Please read this handbook carefully and pay particular attention to issues highlighted as important. In most instances, being aware of potential problems and acting quickly when they occur is sufficient to avoid unnecessary complication and trouble during your studies. Our primary aim is that you are successful in your studies and graduate from the programme; it is therefore essential that you stay in contact and communicate with your Personal Tutor immediately if any circumstances arise that may affect your performance.

Some important general aspects covered in this handbook are further amplified in the University's *Code of Practice for Taught Postgraduate Courses*, which are issued to you with your matriculation papers and which you are also expected to read. This handbook does not supersede the University [Regulations](#), or the [University's Respect and Dignity policy](#).

**Please note that every effort has been made to ensure that the information contained in this handbook was correct at the time of printing, but changes, of which you will be informed, may be required in some of the details. This handbook follows the university regulations and government regulations on Covid. Updates will be provided when information included in the handbook needs to change.**

## 1.2 MSc Staff Contacts

This MSc programme is mostly delivered by staff within the Institute for Energy Systems (IES) at the School of Engineering, though some staff from outside IES also contribute.

The main contacts for students on the MSc Sustainable Energy Systems are listed in Table 1 below. Unless otherwise stated, all rooms are in the Faraday building.

**Table 1: MSc Staff Contact**

CO =Course Organiser; AGB = Alexander Graham Bell building; FJ = Fleming-Jenkin building; Sand.= Sanderson building; \* = non-IES staff

Position	Name	Location	Telephone	Email
Programme Director	Dr Brian Sellar	1.058	0131 650 7304	<a href="mailto:Brian.Sellar@ed.ac.uk">Brian.Sellar@ed.ac.uk</a>
Deputy Programme Director	Dr Dimitri Mignard	3.089	0131 651 9024	<a href="mailto:D.Mignard@ed.ac.uk">D.Mignard@ed.ac.uk</a>
Convener of Board of Examiners	Prof Sasa Djokic	4.112	0131 650 5595	<a href="mailto:sasa.djokic@ed.ac.uk">sasa.djokic@ed.ac.uk</a>
Director of Teaching	*Prof Tim Stratford	FJ 1.193	0131 650 5722	<a href="mailto:Tim.Stratford@ed.ac.uk">Tim.Stratford@ed.ac.uk</a>
Head of Institute	Prof Alasdair McDonald	2.078	0131 650 5652	<a href="mailto:Alasdair.McDonald@ed.ac.uk">Alasdair.McDonald@ed.ac.uk</a>
Dissertation Coordinator	Dr Andrew Lyden	4.122	TBC	<a href="mailto:Andrew.Lyden@ed.ac.uk">Andrew.Lyden@ed.ac.uk</a>
CO (Mech. Eng. Fundamentals)	Dr John Chick	4.114	0131 650 5575	<a href="mailto:j.p.chick@ed.ac.uk">j.p.chick@ed.ac.uk</a>
CO (Electrical Eng. Fundamentals)	Dr Jonathan Shek	3.107	0131 650 7814	<a href="mailto:j.shek@ed.ac.uk">j.shek@ed.ac.uk</a>
CO (Technologies for Sustainable Energy)	Dr Camilla Thomson	1.188	0131 6513526	<a href="mailto:C.Thomson@ed.ac.uk">C.Thomson@ed.ac.uk</a>
CO (Energy and Env. Economics)	Dr Andrew Lyden	4.122	0131 650 7304	<a href="mailto:Andrew.Lyden@ed.ac.uk">Andrew.Lyden@ed.ac.uk</a>
CO (Eng. Res. Methods with Grand Challenge)	Dr David Garcia Cava	3.12 AGB	0131 6505588	<a href="mailto:david.garcia@ed.ac.uk">david.garcia@ed.ac.uk</a>
CO (Distr. Energy Res. and Smart Grids)	Dr Michael Merlin	FJ 1.189	0131 6505726	<a href="mailto:Michael.Merlin@ed.ac.uk">Michael.Merlin@ed.ac.uk</a>
CO (Principles of Wind Energy)	Prof Alasdair McDonald	2.078	0131 650 5652	<a href="mailto:Alasdair.McDonald@ed.ac.uk">Alasdair.McDonald@ed.ac.uk</a>

<b>CO</b> (Solar Energy and PV systems)	Dr Aristides Kiprakis	3.090	0131 650 5586	<a href="mailto:aristides.kiprakis@ed.ac.uk">aristides.kiprakis@ed.ac.uk</a>
<b>CO</b> (Marine Energy)	Prof Vengatesan Venugopal	3.091	0131 650 5652	<a href="mailto:V.Venugopal@ed.ac.uk">V.Venugopal@ed.ac.uk</a>
<b>Course Lecturer</b>	Dr Ignazio-Maria Viola	3.093	0131 650 5622	<a href="mailto:I.M.Viola@ed.ac.uk">I.M.Viola@ed.ac.uk</a>
<b>Course Lecturer</b>	Prof Markus Mueller	1.58	0131 650 5602	<a href="mailto:markus.mueller@ed.ac.uk">markus.mueller@ed.ac.uk</a>
<b>CO</b> (Energy Policy and Politics)	*Dr Ronan Bolton	School of Social and Political Sciences	0131 650 6394	<a href="mailto:Ronan.Bolton@ed.ac.uk">Ronan.Bolton@ed.ac.uk</a>
<b>CO</b> (Power Systems Eng. and Economics)	Dr Sasa Djokic	4.112	0131 650 5595	<a href="mailto:S.Djokic@ed.ac.uk">S.Djokic@ed.ac.uk</a>
<b>CO</b> (Technology and Innovation Management)	*Dr Matjaz Vidmar	Sand. 1.085	0131 668 8461	<a href="mailto:Matjaz.Vidmar@ed.ac.uk">Matjaz.Vidmar@ed.ac.uk</a>
<b>Other academic staff</b>	Dr Daniel Friedrich	4.123	0131 650 5662	<a href="mailto:d.friedrich@ed.ac.uk">d.friedrich@ed.ac.uk</a>
<b>Other academic staff</b>	Prof Gareth Harrison	4.124	0131 650 5583	<a href="mailto:gareth.harrison@ed.ac.uk">gareth.harrison@ed.ac.uk</a>
<b>Other academic staff</b>	Dr Colin Pritchard (Part Time)	Alrick 1.074	0131 650 4852	<a href="mailto:colin.pritchard@ed.ac.uk">colin.pritchard@ed.ac.uk</a>
<b>SES MSc Secretary</b>	Miss Mhairi Sime	ETO		<a href="mailto:msime2@ed.ac.uk">msime2@ed.ac.uk</a>

**Programme Director and Deputy:** responsible for the organisation of the MSc programme, admission, deadlines, general academic guidance and pastoral support.

**Personal Tutor:** responsible for academic guidance and pastoral support; special circumstances which may arise, e.g. from difficult personal situations.

**MSc Secretary:** responsible for all formal matters such as registration, the handing in of coursework, permission letters for use of dictionaries in examinations and the timetable.

**Course Organisers/Lecturers:** responsible for any issues that arise with the taught courses and with the dissertation: questions about lecture notes, tutorial problems, details of examinations, coursework, etc.

#### Regarding the MSc Dissertation:

- **Project Supervisors:** responsible for any academic issues concerning projects, mission statements and supervision.
- **Project examiners:** Second markers for MSc project thesis, who also conduct interviews of students as part of the MSc dissertation project process.

## 2 Overview of MSc Programme

### 2.1 Programme Objectives and Requirements for Award

The MSc in Sustainable Energy Systems is a programme of studies grounded in Engineering, which provides graduates and working professionals with a broad training in, and understanding of, energy systems in the context of the sustainability of energy supply. The program has a strong emphasis on energy systems where electricity is the final product, however energy is also considered in the wider context of consumption patterns, efficiency, economics, policy and regulation. While there is particular focus on the deployment of renewable energies in grid-connected systems, there are also opportunities to explore off-grid systems e.g. in dissertation projects. To give a practical edge to the gained theoretical knowledge, a number of field trips will be organised to local power stations, subject to approval of the management of power stations.

This programme of study is designed for those:

- from cognate engineering disciplines wishing to specialise in this field;
- working in industry who wish to update their knowledge and skills;

Non-engineers may also be admitted on the programme, who are seeking a good understanding of the engineering aspects of energy systems so that they can work within this sector, including in partnership with engineers where

required (typically, those students may include physicists, as well as chemists and mathematicians and economists, but exceptionally graduates from other disciplines outside science and engineering are accepted).

In order to be awarded the MSc in Sustainable Energy Systems, students must meet the following two criteria:

- For the taught part of the programme (i.e. excluding the Dissertation), they must pass at least 80 credit worth of courses (out of the 120 that are available) with a minimum mark of 50% on each course, while also obtaining an average of at least 50% over all the taught courses. (Regulation 56 in the [Taught Assessment Regulations for Academic Year 2021/22](#)).
- For the Dissertation, they must obtain a final mark of at least 50% (as per Regulation 57 in the same reference).

For more detail, please refer to the [Taught Assessment Regulations for Academic Year 2021/22](#), in particular regarding the conditions under which students can be awarded the Postgraduate Diploma or the Postgraduate Certificate when not managing to satisfy all criteria for the award of the MSc.

## **2.2 Programme Structure**

The MSc in Sustainable Energy Systems is provided as a full-time programme taught over one year, starting in September. The programme is taught in modules/courses, to provide essential background material, as well as advanced specialist topics in the field. The programme concludes with a research dissertation.

The programme has a modular structure, with the award of credits for successful completion of each course and dissertation. There is a total of 180 credits required (120 from taught courses, plus 60 from the dissertation), for which students' performance will be assessed for the award of the Master's Degree. Taught components are confined to the first two semesters of the academic year.

We reserve the right to withdraw options if there is insufficient demand to make them viable or unforeseen changes in the timetabling of these options outside of the School of Engineering control, and to restrict option choice according to qualifications and experience of individual students. Some optional courses are subject to a quota, when only a limited number of MSc students can be enrolled, and others require students to have studied specific topics prior to joining the programme. Because of timetabling constraints, it is not possible for us to offer unrestricted choice of options.

### **2.2.1 Overview of taught courses**

#### **SUMMARY:**

Students are expected to take core courses and optional courses in each semester. Most of the courses are at level 11 (equivalent to MSc or 5<sup>th</sup> year undergraduate MEng courses), but some of the courses may be at level 10 (equivalent to undergraduate 4<sup>th</sup> year courses), which, as experience has shown, does not necessarily mean that you will find them easy!

Students are expected to make themselves familiar with the offered courses and take the opportunities provided to talk to the staff involved in the courses in which they are interested. During the Introductory Week or as early as possible in Week 1, students should have a meeting with the Personal Tutor or Deputy Programme Director regarding choice of optional courses. Ideally, students will be expected to have made up their minds about their choice of courses, in consultation with the Personal Tutor or Deputy Programme Director, by the first day of each semester. Changes are possible during the first two weeks of the Semester, as long as approval of your Personal Tutor can be secured, places are still available on the courses that you wish to be transferred to, and group work is not disrupted in the old or new courses.

In Semester 1, the following three 10 credit core courses lay the foundations for a deeper understanding of Sustainable Energy Systems, and introduce the specialist courses of Semester 2:

- Technologies for Sustainable Energy Systems introduces the resource and engineering characteristics of major types of renewable energy, particularly wind, solar and marine (tidal and wave) energy, including basic quantitative techniques as well as constraints and fundamentals of economic analysis and grid integration.
- Sustainable Energy Contexts aims to establish a basic understanding of global patterns of energy use and systems of energy supply, in the context of their sustainability: social, environmental and economic. It is structured so as to familiarise students with the wide range of literature on sustainability, and will develop independent study and analysis skills.

- Engineering Research Methods with Grand Challenge aims to equip students with essential skills for engineering research, which have been proved to be of high demand and beneficial. On completion of this course, students will be able to gain technical understanding of research in their field of engineering through a study and solution design for a particular problem and have an understanding of research in a wider societal context and an ability to prepare reports with technical information for specialist audience.
- Energy and Environmental Economics examines the theoretical framework of conventional as well as ecological economics, with applications to understanding industry, company and consumer behaviour; resource extraction; pollution control; energy markets; taxation that affect energy production and use; and other aspects relevant to energy systems.

In Semester 1, students must also attend one of 2 elective core courses, either Mechanical Engineering Fundamentals for Renewable Energy, or Electrical Engineering Fundamentals for Renewable Energy. Students must register on one of these courses (whichever is the one that they will be least familiar with); each is worth 10 credit points. Both may be attended, and in fact it is essential that students lacking in both Electrical and Mechanical Engineering background do so to help them succeed in Semester 2; however students will only take the exam in the one that they are the **least** familiar with.

In addition to the above, students must take 20 credit worth of optional course in Semester 1. These options may be from non-engineering subjects, and availability of any one in a particular year is not guaranteed.

In Semester 2, all students take all four 10-credit courses: Principles of Wind Energy; Solar Energy and Photovoltaics; Energy and Environmental Economics; and Marine Energy (MSc), i.e. a total of 40 credits.

Students must also take 20 credit worth of optional course in Semester 2 which brings them to a total of exactly 60 credits in Semester 2.

Finally, during the summer months, students carry out a project (Sustainable Energy Systems Dissertation) worth 60 credit points.

The optional courses listed below will be offered subject to availability, course quota and possibility of including them in the MSc timetable. Apart from the options shown, students may select their own optional courses from within level 11 courses offered by the University of Edinburgh, subject to the approval by the Personal Tutor and appropriate School offering a course. Timetables for different degree programmes can be checked at <https://path.is.ed.ac.uk/>

## **SEMESTER 1:**

### **Core courses:**

- **Technologies for Sustainable Energy** (10 credits, level 10)
- **Sustainable Energy Contexts** (10 credits, level 10)
- **Engineering Research Methods with Grand Challenge** (10 credits, level 11)

One of either:

- **Electrical Engineering Fundamentals of Renewable Energy (EEFRE, 10 credits, level 11),**  
or
- **Mechanical Engineering Fundamentals of Renewable Energy (MEFRE, 10 credits, level 11)**

Students with a first degree in Electrical/Electronic Engineering should normally take MEFRE, while students with a first degree in Mechanical/Chemical/Civil Engineering (or similar) should normally take EEFRE. Students with a non-engineering background can register for either course, but are required to attend the lectures of the other course (without sitting the exam) so that they are adequately prepared for all core courses in Semester 2. Students with an Engineering background that had too little of both Mechanical and Electrical Engineering (for example, if they had not studied any electrical engineering nor fluid mechanics) would also be wise to attend both courses. Please note, however, that in any case it is **not** permitted to register for both MEFRE and EEFRE on EUCLID, but you can get registered for both on LEARN and access all materials this way.

### **Optional courses:**

You are required to choose 20 credits from the list that was circulated earlier. This year, these include

**Carbon Capture and Transport** (20 credits, level 11)  
**Distributed Energy Resources and Smart Grid** (20 credits, level 10)  
**Sustainable Theory and Contexts** (20 credits, level 11)  
**Fundamentals of Infrastructure Finance** (10 credits, level 10)  
**Applied Energy Finance** (10 credits, level 10)  
**Power Conversion** (10 credits, level 10)

**Power Systems** (20 credits, level 10)

***For Power / Electrical Engineers only***

## SEMESTER 2:

### Core courses

- **Marine Energy (ME)**, 10 credits, level 11)
- **Principles of Wind Energy (PofWE)**, 10 credits, level 11)
- **Solar Energy & Photovoltaic Systems (SE&PV)**, 10 credits, level 11)
- **Energy and Environmental Economics** (10 credits, level 11)

### Optional courses

You are required to choose 20 credits from the list that was circulated earlier. This year, these include

**Energy Policy and Politics** (20 credit variant, level 11)

**Energy Policy and Politics** (10 credit variant, level 11)

**Power Systems Engineering and Economics** (20 credits, level 11)

**Technology Entrepreneurship** (10 credits, level 11)

**Technology and Innovation Management** (10 credits, level 11)

**Nuclear Waste Management: Principles, Policies and Practice** (10 credits, level 10)

**Separation Processes For Carbon Capture** (10 credits, level 11)

**Environmental Impact Assessment** (20 credits, level 11)

**Advanced Power electronics and Machines** (20 credits, level 11)      *For Power / Electrical Engineers only*

### **2.2.2    Overview of MSc Dissertation**

#### 2.2.2.1 Progression to Dissertation

Students who achieve an appropriate overall mark in the taught component (i.e., **minimum total of 80 credits worth of courses each passed with a mark above 50%; and an overall average mark above 50% including all course components**) are permitted to progress to the Dissertation stage of the programme. They are required to conduct an independent research Dissertation Project, the topic of which will be decided before or at the beginning of Semester 2, when **part-time** work on the Dissertation should start.

#### 2.2.2.2. Health and Safety workshop; Ethics and Professional Conduct workshop

Formally part of the Dissertation course, in the first half of Semester 2 all students will attend the following workshops, which are requirements under the accreditation of this MSc programme by the Energy Institute:

- Health and Safety, covering UK legislation, hazard identification and risk assessments
- Ethics and Professional Conduct, including developing as an ethical professional and the Energy Institute's code of conduct.

Both workshops will run over half a day in total (split in two parts) and are assessed by exercises for which an overall pass or fail mark is awarded. Repeats are permitted to ensure that everyone gets the chance to pass. We aim at completing workshops and assessment within the first half of the Semester.

#### 2.2.2.3 Summer months

**Straight after the Semester 2 exams**, students must work **full time** on their Dissertation projects, until the final submission date. Not doing so can compromise their chances of success on the dissertation component of the MSc.

Following the submission, each student will be required to prepare a poster on the subject of their Dissertation. The poster will be assessed on the Poster Day, when all staff and students will be invited. The MSc students are required to present their posters **in person**, so that they can answer any question asked.

Individual students are normally assigned their Dissertation research topics in a way that takes into account their preferences. However, as an alternative, students are encouraged to initiate, define and refine their own projects in collaboration with potential supervisors. This process is explained in section 3.2.1.

A successfully completed Dissertation provides a clear evidence of the student's ability to conduct independent research in a particular field of study. It is, therefore, of great importance to the students, and may be of interest to their potential employers.

### **3    MSc Dissertation**

#### **3.1    Introduction**

MSc Dissertation projects are practical research or design exercises. They give the student experience in applying knowledge and understanding gained in earlier study, as well as increasing the student's competence in a particular area of study.

The objective output of a project is a design or supported conclusions or knowledge in answer to original research questions, the extent of attainment of which forms part of the overall assessment. However, skills and attitudes appropriate to the professional engineer, developed in pursuit of the objective output, are just as important and are given corresponding weight in the assessment.

The project work develops student skills through applied research of a topic.

#### **3.2    Project Organisation**

##### **3.2.1    Process**

- Project allocation to students is typically done in Semester 2. Detailed process of allocation as well as schedule will be instructed by the Dissertation Organiser in Semester 1.
- Some students prefer to come up with their own ideas for projects in Semester 1, rather than wait for the allocation process in Semester 2. Please note: this is the only authorised route for pre-allocated projects, and you are not allowed to jump the selection process by approaching a supervisor and asking them to give you a project. Instead, you must have some input in framing the questions and contents of the project, which must originate from your own initiative and the discussions that follow with the supervisor. Should anyone wish to do so, they must identify and approach an appropriate supervisor with the right expertise (and possibly external to the School or University), as well as a thesis examiner, one of which must be from within the School of Engineering. It is important to secure a project that meets with the full and documented endorsement of the supervisor and the examiner, with the right supervisory expertise as well as satisfies the criteria set out in the course descriptor for the Sustainable Energy Systems Dissertation course (PGEE11017), as checked by the Dissertation Organiser.
- A couple of seminars will be given to students in Semester 2 on the following topics: "Do's and don'ts of the MSc project" and "Health and Safety: why you should care about it whatever your project". Notes from these seminars will be posted on LEARN, as well as an exemplary thesis from a previous year.
- Dissertation work begins once the projects have been allocated. This will involve preparation work; literature review and preliminary study of the topic; ascertaining or developing an appropriate method for addressing the research questions; and ensuring that key components and equipment are ready for the main practical phase in the summer. As a guide, the student should spend about three hours per week on this preparatory phase of the dissertation.
- Student and supervisor should meet as soon as allocation is done, to discuss the dissertation topic, and begin the preparation of the Mission Statement which is to be submitted towards the end of Semester 2. The aim of the mission statement is for the students to clearly formulate research questions of genuine interest to energy engineering (including in some cases wider economical or sociological aspects of it) with a proper literature survey that justifies the current relevance of these questions; and to present a methodology for tackling these questions that is supported by informed by literature findings and critical thinking. (The mission statement is clearly not a regurgitation of the description given at the start of the project!) Further meetings or email exchanges should take place during the semester to monitor progress.
- The main phase of the dissertation work starts immediately after May examinations. **Students should work full time on the dissertation until the submission of the thesis in August, and are very strongly advised not to leave the University or take any significant time off during that period.**
- Following the May examinations, students should meet with their dissertation supervisors normally once per week. In the course of these formal meetings, the supervisor will inspect and sign the student's Day-Book, and it is the student's responsibility to bring this book and add notes to it during the meeting. Prior to supervisor's absence due



to holidays or business meetings, the student and supervisor may agree a detailed programme of work for that period, however by July a student who is on course for a successful completion of the project would be expected to demonstrate enough autonomy in the conduct of the research project that weekly meetings with the supervisor may not always be necessary.

- After May examinations, a Dissertation Seminar will take place, during which students present their plans for dissertation work and expected outcomes. Each student should give a short 10-20 min talk on their dissertation to a group consisting normally of 2-3 supervisors with their students. The students must give a clear presentation of the relevance, objectives and detailed methods and planning of the project, which they will have to think very hard about beforehand. The aim of the exercise is for them to get feedback from the audience (often in the form of constructive criticism and helpful advice, which they must implement if their supervisor agrees with it). Obviously, at this stage there is no expectation that students will show many results. However, a Gantt chart specifying project stages, milestones and deliverables should be presented. No mark will be awarded for the seminar. The dates for the seminars will be arranged by the supervisors and thesis examiners when prompted by the students. It is the student's responsibility to initiate this process in due time.
- In the middle of the dissertation work, each student will be interviewed individually by their dissertation thesis examiner. It is the students responsibility to initiate this process in due time. The thesis examiner will gauge the progress of the student and obtain familiarity with the practical work. This progress assessment interview lasts approximately twenty minutes and will normally be held in the thesis examiner's office. The supervisor will not be present. The student will present an oral synopsis of their progress to date, using reference to daybook to provide detail, where required. The thesis examiner will inspect and sign the daybook. Following the interview, which should be guided by the Practical Work section of the dissertation assessment scheme, the student will demonstrate the software, hardware, or simulations, produced to date. This demonstration should last approximately ten minutes. The thesis examiner will report the assessment of progress by a single email message (in plain text) addressed to the student, the supervisor and the Programme Director. In the case of a satisfactory assessment of all aspects of progress, no further detail is required. However, where there is any cause for concern, this must be clearly described, and a proposal for follow-up actions should be given.

**Note: It is important to maintain e-mail correspondence with your supervisor(s), in order to organise meetings and allow for discussing your work. You should use your University e-mail account for this purpose and check your e-mail-box at least once per day.**

- The final editing of the thesis and the preparation of obtained results (graphs, diagrams, tables, etc.) always takes longer than expected. It is a good idea to write up as you go along during the project, for example your literature survey while you are reading papers and your "materials and methods" while you are finding out how to address the research questions. Students are advised to agree with their supervisor the list of contents at least 3-4 weeks before the thesis submission date. Furthermore, a full initial draft of the thesis should be completed at least 2 weeks before the recommended time for submission. This will enable difficulties to be ironed out in good time and still allow for final results to be included in the final version.
- Students are advised to submit **one** chapter of MSc dissertation to their supervisor **at least** one week prior to the submission day. The supervisor will read it in order to comment on style, and other aspects as he or she deems fit to do so. The student should be able to extrapolate comments made on that chapter to the rest of the thesis when appropriate. IT IS NOT ALLOWED TO HAVE MORE THAN ONE CHAPTER REVIEWED BY SUPERVISOR OR EXAMINER (AND IF BOTH ARE HELPING IT MUST BE THE SAME CHAPTER THAT BOTH SEE). The simple reason for this is that it is your work that is going to be assessed, not theirs!
- Students will be also required to prepare a poster to be submitted by specified date. The poster will be displayed and assessed. Students' attendance at the Poster Day is required, in order to present the work and answer any questions.

### **Working with PhD Students**

Once a Dissertation topic has been chosen, it may occasionally overlap with an IES PhD student's project. In these cases, our PhD students may be willing to offer additional tutoring and support in exchange for an accredited collaboration of work in an area of their research. Please check with your dissertation supervisor if you would be interested in doing this once your dissertation title has been decided.

### **3.2.2 Practical Issues for MSc Dissertations**

#### **3.2.2.1 Health and Safety**

All students must study the University safety handbook and make themselves conversant with emergency

procedures and relevant regulations. Good housekeeping; wearing appropriate Personal Protective Equipment; and carrying out and following risk assessments are all key component of a safe environment, and will be considered as part of the practical work when marking the dissertation thesis.

#### AT YOUR DESK:

Many of the students on the course will be conducting desk-based studies, and as such the requirements for risk assessments may not seem to be so critical, and safe laboratory or workshop practice won't apply. Nevertheless, in industry Risk Assessments may be carried out even in offices, because occupational health issues can result in loss of performance from employees and possibly even prosecution and fines for the employers.

As an exercise for **every** student undertaking the Sustainable Energy Systems Dissertation, the following form must be completed:

<http://www.docs.csg.ed.ac.uk/Safety/ra/DSE.doc>

which will also be posted on LEARN. All students must include the completed form in their thesis as an Appendix.

It is not as trivial or unnecessary an exercise as you may think: in this School, we are aware of no less than three cases when the health of colleagues was affected by improper use or setting of equipment in an office, all diverse and very typical: one regarding eyesight damaged by exposure to heat from computer screens, with subsequent hospitalisation; another was a back injury due to a chair; and a third one an injured wrist due to repetitive keyboard strain from typing, which required surgery.

#### IN LABORATORIES (subject to Covid and university guidance)

With respect to access and safe working in laboratories, please note that the **NORMAL SCHOOL AND UNIVERSITY SAFETY PROCEDURES APPLY. In particular, please refer to the following, as well as 3.2.2.2 and 3.2.2.3**

For projects that require working in a laboratory or workshop or factory floor, or in any environment where significant hazards are involved: A Risk Assessment **must** be completed and followed (please get your supervisor to approve and sign it, and you must sign it too), and a Safe System of Work devised before starting, and all these included in the thesis when you write up. Evidence that this was carried out is taken into account in the marking scheme for your final report.

The forms and their respective guidance for filling them in can be found on the University's Health and Safety web page:

<https://www.ed.ac.uk/health-safety>

Most often, it is one or several of the following ones that are relevant, depending on the type of work:

- **General Risk Assessment: Form RA1** <https://www.docs.csg.ed.ac.uk/Safety/ra/RA1.docx>
- **COSHH: Hazardous Substances Form** (replaces the previous form if chemicals are involved) - [https://www.docs.csg.ed.ac.uk/Safety/ra/COSHH\\_form.docx](https://www.docs.csg.ed.ac.uk/Safety/ra/COSHH_form.docx)
- **Safe System of Work Form** (always required for practical work) [https://www.docs.csg.ed.ac.uk/Safety/ra/SSW\\_form.doc](https://www.docs.csg.ed.ac.uk/Safety/ra/SSW_form.doc)

In addition, and consistent with School Policy, students **must** follow standard safety practice, in particular:

- wearing appropriate Personal Protective Equipment (\*) where required;
- **not** bringing food and drinks into the lab, ever!
- keeping your bench tidy;
- labelling all containers with chemical contents, always – even if it's just water;
- reporting all incidents and accidents;
- never locking yourself in a lab or workshop;
- no working in the laboratory or workshop outside normal working hours (9-5pm);

(There are very good reasons for each of these – can you think what these may be?)

Failing to do so or not taking into account the risk assessment could result in you being prevented to continue the work. This is not just us being strict, it is the expected standard in industry, and so this process and culture are a good learning experience for you.

(\*) Personal Protective Equipment (PPE) refers to safety glasses, gloves, labcoats, shoes etc. that you would be required to wear if you were carrying out tasks or working within an environment where hazards were present (as identified in your risk assessment). The PPEs are your last line of defence against these hazards after engineering controls and safe practice are enforced to minimize the risk of harm. Note that there are different types of e.g. safety glasses and gloves, please make sure you pick the right ones for the hazards that you have identified!

## FIELD TRIPS

Likewise, with field trips or when working abroad, a Risk Assessment must also be completed before starting and included in the final thesis. The links are in the same page as previously given, for the relevant forms:

**Fieldwork Assessment: Form FA1** see the pages at <https://www.ed.ac.uk/staff/business-travel>

**Overseas Travel Risk Assessment** see the pages at <https://www.ed.ac.uk/staff/business-travel>

### 3.2.2.2 Key or Code Access

Special project laboratories may require a key or code for access. Provision of this to a student must be requested by the project supervisor, who will provide a signed memo addressed to the Director of Teaching, approving that a key or code should be issued for this purpose. The student will take this memo to the MSc Administrator, who will process the request and e-mail the student when the key or code is ready for collection.

### **POSSESSION OF A KEY OR ACCESS CODE DOES NOT CONVEY PERMISSION TO WORK IN A LABORATORY OUT OF NORMAL HOURS.**

It is specifically forbidden to work in a locked room.

### 3.2.2.3 Out of Hours Access

Out with normal working hours, but during hours for which servitor cover of the buildings is provided, i.e. **17.00 – 20.30, Monday – Thursday during Semester time**, students are permitted access to the areas only where a normal “office area risk assessment” applies, provided that: they sign the building’s late working book at 17.00, or on entry after 17.00, and sign out when they leave.

Note: Access rules may be different due to covid19 guidance.

### 3.2.2.4 Stores

If you are doing an MSc Dissertation which includes the construction of hardware, you will need to become familiar with the operation of the School Stores and the Equipment Store. The School Stores hold stocks of components and consumables, which may be drawn for use in project work after an approval by your supervisor, by filling out a standard chit. In addition to your name, the date, and details of the items drawn, you must write the following on the chit. Against “Dept”: write “Electronics”, against “Grant Ref”: write your supervisor’s initials, against “Reason For Use”: write “MSc Dissertation”.

Articles which are not stocked in the School Stores may be ordered direct from suppliers. Consult your supervisor if this is necessary. The Equipment Store holds a stock of test equipment (oscilloscopes etc.), safety equipment (goggles etc.), and construction equipment (soldering irons etc.) for hardware build and test. Any item drawn from the Equipment Store must be returned before the end of the year. Any equipment suspected of being faulty must be returned to the Equipment Store controller immediately, for repair. Your supervisor will provide more information and guidance on drawing equipment from this store.

## 3.3 MSc Dissertation Learning Outcomes, Deliverables and Submission

### 3.3.1 Learning Outcomes

These can be found on the drps pages of the University's website. We list them below for reference.

- 1) Applying knowledge and understanding from earlier studies, as well as increasing competence in particular areas of study or research related to sustainable energy systems.
- 2) Delivering added value through the answer to one or several associated original (novel) research or design questions that are explicitly related to sustainable energy systems engineering. The scope of these questions may be of scientific, design or operational nature, or it may cover an economic or social science aspect of energy engineering. An application of a well-established method to a particular system is not in itself an original research topic, but an appropriate design of the research program would generate appropriate datasets and interpretations of these that answer a wider question of genuine general interest on such systems.
- 3) Conducting systematic and targeted literature searches from relevant peer reviewed literature, technical reports, personal communications, patents, specification sheets, databases, company literature, etc., with the aims of: 1) checking the timeliness and relevance of a research or design question, and if appropriate modify that question or reformulate new questions accordingly; 2) establishing the prior history as well as the state-of-the-art in the field; 3) putting the question into its wider context outside engineering, e.g. current and prospective societal needs, public acceptance and policy, markets and economics, regulations etc.; 4) inform the methodology and metrics to be applied in the project; 5) establish benchmarks for comparing project results with prior ones.
- 4) Demonstrating an ability not just to gather data, but also to interpret it, as well as to critically appraise the sources and contents and to compare between sources, and if necessary proposing appropriate metrics for comparison and attempting the recasting data from disparate sources into a common format. Being critical of one's own result, clearly establishing their range of validity and the uncertainties.
- 5) Designing, planning and executing an original research programme appropriate to answering the research or design questions that the project is asking, being mindful and observant of health and safety issues and procedures. Planning also includes the writing up of the thesis, and adjusting this programme of work as the project progresses to suit e.g. changing circumstances, setbacks, or new insights that are brought about by results.

### 3.3.2 Deliverables

1. **DAYBOOK:** Every MSc student will set up and maintain a method - either paper-based or digital - of keeping chronological records of their progress, herein named a "Day-Book". Students will routinely report on their progress in the Day-Book as the project develops. For further guidance regarding this, please refer to section 3.5.6. The Day-Book will be inspected and commented on by the supervisor at each meeting between student and supervisor. The supervisor's review of the Day-Book must be trace-able, e.g., via a copy of comments made in e.g., MS Teams, Email, MS PowerPoint, other digital document etc. **MSc Dissertation submission is not complete without the Day-Book.**
2. **MISSION STATEMENT:** A Mission Statement will be produced jointly by student and supervisor, detailing the aims and scope of the MSc Dissertation. The student and supervisor are jointly responsible for ensuring that a signed copy of the Mission Statement is delivered to the MSc Administrator by the specified deadline (preliminary given in the Calendar of Events).
3. **MSC DISSERTATION SEMINAR:** After the May examinations, the student will deliver an MSc Dissertation Seminar. Seminars should be of approximately ten minutes duration, with an additional five to ten minutes for discussion. They must give some background to the subject area and clearly describe the intended programme of Dissertation work. Each seminar will be attended by: Dissertation Supervisor, Thesis Examiner, and a number of other students. No mark will be awarded for the seminar but this milestone provides a great opportunity for feedback.
4. **SUBMISSIONS:** Students are strongly advised to submit their MSc dissertation and Day-Book no later than the recommended time in the calendar of events. Note that a submission is not accepted until both the Day-Book and the Dissertation are presented. Submission later than the deadline will result in a reduced assessed value of the submitted work. **Please note: In fairness to all students, all deadlines are hard and will be strictly enforced.**

The Programme Director will set the submission date for the MSc Dissertation deliverables which consist of:

- A digital copy, to be submitted via LEARN, in PDF format of the Dissertation with the dissertation title, student name and matriculation number appearing on the title page of the MSc Dissertation thesis.
- The original Day-Book(s), or e-daybook.
- Electronic copy of the MSc Dissertation Poster (A4 format, as a .PDF or .PPT file), to be also submitted by LEARN. Arrangements for printing one hard copy of the poster (A1 format) will be set in due time.
- Any other deliverables that were specified in the Mission Statement, including models and datasets and original drawings, in electronic form e.g. on a data stick (please avoid CD-ROMs) or emailed to supervisor and examiner, or made available to them on a shared electronic dropbox.

### 3.3.3 Submission

- Your dissertation thesis, plus your original Day-Book(s), must be submitted to the Course/MSc Administrator no later than the specified deadline (preliminary dates are given in the Calendar of Events).
- Submissions which are not complete before the deadline are subject to the late submission penalty, as indicated below.
- You may apply to your supervisor for the return of your Day-Book(s) after the Board of Examiners meeting. You may also keep hard copy of your poster after presenting it on the Poster Day.

### 3.3.4 Penalties for Late Submission

The same late submission penalties and other regulations for coursework submission apply for MSc thesis submission. Deadlines will be strictly adhered to and the following penalty is imposed for late submission:

- Up to 1 day late = loss of 5% of **total** marks
- 2-5 days late = loss of 5% of total marks for each working day (or part of it) up to the end of the 5<sup>th</sup> day.
- Later than 5 working days = a mark of **zero** will be given.

Please note that these penalties will be applied even if student has informed Programme Director and Personal Tutors of difficulties, and if corresponding Special Circumstances are reported. **In genuine cases, and subject to approval by Special Circumstances Committee, late submission penalty may be removed.**

To ensure that you never incur penalties, you are strongly advised to submit work well before the deadline.

## 3.4 MSc Dissertation Mission Statements

### 3.4.1 Requirements

The first stage of an MSc dissertation is production of a Mission Statement. The purpose in each case is the same: to state at its outset briefly, but clearly, the intended scope and objectives of the work.

All mission statements will include the following declaration above the signatures:

***The supervisor and student are satisfied that this MSc Dissertation Project is suitable for performance and assessment in accordance with the guidelines of the course documentation.***

### 3.4.2 Production

The Mission Statement is produced by the student, in consultation with the supervisor. During preliminary meetings, the supervisor directs the student as to the expected nature and scope of the work, and may direct or assist in the specification of one or more objectives. When a draft of the Mission Statement (which is satisfactory to both the student and supervisor) has been produced, they will sign and date it before uploading to Learn via dropbox by the deadline specified by the Programme Director.

### **3.4.3      Variation**

It is in the nature of MSc Dissertation that, as a result of design or implementation work, literature search, or experimental results, the need for a change in direction or emphasis is identified in one or more elements described in the Mission Statement. Should you feel that it is necessary for your project work to deviate significantly from the Mission Statement, this should be discussed with your supervisor and a revised plan agreed. There is no need to submit a revised Mission Statement.

### **3.4.4      Inclusion in the Dissertation**

The original Mission Statement must be bound in as part of the MSc Dissertation. Where the original plan has been significantly revised, as discussed in Section 4.4.2.3, this should be appropriately addressed in the abstract, introduction, main discussion and conclusion sections. The dissertation should contain all the background and reasoning required to justify the revision. This material will assist the assessors in formulating a view on your abilities in organisation and planning, critical assessment, and initiative.

## **3.5      Assessment of MSc Dissertation**

### **3.5.1 Learning outcomes**

Students should make themselves familiar with the learning outcomes of the Sustainable Energy Systems Dissertation (PGEE11017) which are listed in section 3.3.1, and against which they are assessed for successful completion of the dissertation project component of the MSc.

### **3.5.2 Overall mark**

The overall Dissertation mark consists of 95% for the practical work and the thesis, and 5% for the poster presentation. The practical work and thesis are assessed independently by a supervisor and an examiner. A detailed marking scheme will be made available on LEARN.

### **3.5.3      MSc Poster Presentation: 5%**

Students will be given a course on how to prepare a poster and how it will be assessed. Both actual presentation of the poster (this is oral presentation **and** defending of your Dissertation work) and the poster itself are contributing to the allocated mark. Therefore, it is important that students attend the Poster Day – if student is not present, only the poster will be marked, which may be resulting in a lower mark.

### **3.5.4      Postgraduate Common Marking Scheme**

#### **Assessment of the MSc dissertation**

<b>Mark</b>	<b>Grade</b>	<b>Description</b>
80 - 89%	A2	An outstanding performance.
70% - 79%	A3	An excellent performance in all aspects, satisfactory for a distinction.
60% - 69%	B	A very good performance, satisfactory for a merit
50% - 59%	C	A good performance, satisfactory for a Masters degree.
40% - 49%*	D	A satisfactory performance for the diploma, but inadequate for a masters degree.
0% - 39%**	E	Fail for the diploma***

Please note that while the University requires individual Schools to consider borderline cases from 68% for distinction and 58% for merit, it is left to the Schools to decide how to address these cases. In the School of Engineering, the policy is to leave all classifications unaffected if they are below 69.50 and 59.50, for overall performances that are borderline for distinction or merit, respectively.

Candidates wishing to proceed to a Master degree must pass the assessment requirements of the initial (taught) stage at an appropriate level at the first attempt before progression to the MSc dissertation. Candidates with marginal failures in elements assessed early in their courses, and for whom such performances may be shown to be atypical in the light of later examination performance, may bring their case to the Examination Board by way of the Special Circumstances Committee. Major revisions of the MSc dissertation with re-submission are not allowable in the case of Masters programmes, unless a special case has been submitted to, and agreed by, the relevant College Postgraduate Studies Committee.

*IMPORTANT REMINDER: Please speak to your Personal Tutor if some Special Circumstances which were outside of your control had an impact on your performance during the studies. If not sure, do not keep quiet, but please check with your Programme Director and/or Personal Tutor.*

### **3.5.5 Requirements for MSc Dissertation Thesis**

#### **3.5.5.1 Length**

Quality takes precedence over quantity. Additionally, you should be able to present the results of your MSc Dissertation work in a clear and concise manner. Therefore, there is a page limit for MSc Dissertation thesis and the information given below should be taken as a reasonable guideline to the expected size of the submitted document.

The pages preceding the main text of a dissertation thesis (title page, declaration, abstract, contents, list of symbols, etc) and Appendices are **not** counted in the numbers given below.

- Main body of MSc dissertation thesis should have a maximum of 60 pages, including text, diagrams, graphs and tables.
- Appendices, which are not counted in the above 60-page limit, are available for presenting additional information relevant for the work described in thesis (e.g. code/programme listings, technical specifications, etc). Appendices will not be assessed by thesis examiners.
- Currently, there are no penalties for exceeding the page limit, but the examiners may read and mark the thesis only up to the above page limit, and simply disregard excess pages.

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#### **3.5.5.2 Style**

As mentioned, your writing should be clear and concise, grammatically composed in accordance to standard British usage. Consult IET publications for examples of acceptable style [www.theiet.org](http://www.theiet.org)

#### **3.5.5.3 Structure**

An MSc Dissertation thesis should be assembled in the following order and bound.

1. Front cover
2. Title page (see below).
3. Copy of the **original** Mission Statement.
4. Abstract (typically not more than 200 words).
5. Declaration of originality (see below).
6. Table of contents (listing chapters, sections, sub-sections, page numbers)
7. List of symbols.
8. Glossary.
9. Main text, addressing the subject of the title.
10. Acknowledgments.
11. References (see below).
12. Appendices

13. Back cover (supplied by the School). \*-this may not be required depending on covid19 guidance.

#### **3.5.5.4 Format**

Students are permitted to use School of Engineering computing facilities to produce MSc dissertation theses.

Theses should be typed or printed, to meet the following specification:

- A4 paper typed, single column, printed on both sides for the sake of resource conservation. Recommended font size: 11. Use standard font types (Times Roman, Courier, Calibri, Arial, etc.) and align the text on both sides ("justify"), or align left.
- At least a 1 inch left-hand margin, 1½ line spacing, with extra spacing to accommodate mathematical equations, etc.
- Chapters, sections, sub-sections of chapters to be numbered decimally.
- Page numbers located at the top right-hand corner of pages to run serially 1, 2,... from the beginning of the main text; earlier pages being numbered i, ii,...
- Diagrams and graphs (upright wherever possible) to be drawn to British Standard, inserted in the body of the text, if necessary on separate sheets, as close as possible to the paragraph/text where they are referred the first time and facing the same way as the rest of the text.
- Colour may be used for diagrams and graphs, where it substantially improves legibility, but monochrome line drawings (e.g. presenting different curves with the lines of different styles: solid, dashed, dotted, or combining lines with symbols, etc.) are normally expected and are preferred for reproducibility. Where colour or continuous shade images are used, all copies must be reproduced to the same standard. Please check that all colour drawings, lines and curves are recognisable on black & white printers.
- Tables, diagrams and graphs to have their number and a clear, explanatory caption or title (graphs should also have a legend), sufficient to make their purpose understandable without reference to the main text, placed directly below them.
- Where any figure (diagram, graph, table, etc.) is not wholly your original work, the caption/title must include a reference to the origin.
- Key equations, tables, diagrams and graphs to be numbered serially, chapter by chapter, (e.g. in chapter 3 the first equation is (3.1), the next (3.2) ; the first figure is Figure 3.1, etc.)
- Equation numbers to be placed on the right-hand side of the page (aligned right).
- SI units to be employed throughout.
- Standard symbols to be used wherever possible. The accepted standard for the setting of mathematical text is that it should be in Times Italic font with units in Times Roman.
- Mathematical symbols to be typed or (where necessary) inked in consistently and carefully in dense, black ink.
- Appendices to be numbered A.1, A.2, ...; equations in Appendix 1 to be numbered (A.1.1), (A.1.2), etc.
- References in the main body of the text to be indicated by numerals, placed either in square brackets (preferred), or superscripted, assigned serially, in order of first appearance. The citation of references is an important aspect of the presentation of any written technical work and is an essential part of any defence from an accusation of plagiarism.
- Listed references to be given in standard form (see below).

#### **3.5.5.5 Title Page**

Name, reference legend, approved title and date to appear in standard form (see below) on the front cover accurately positioned to appear in the window.

**MSc Dissertation Thesis**  
**MSc in Sustainable Energy Systems**  
[INSERT Thesis TITLE]  
[INSERT STUDENT NAME]  
[INSERT STUDENT MATRICULATION NUMBER]  
**August [INSERT YEAR]**



The approved title will normally be that given on the Mission Statement, subject to any approved variation agreed with the supervisor.

#### **3.5.5.6 Declaration of Originality**

As described in the MSc Dissertation assessment information, the assessment of written work, of which reference to work by other authors forms an integral part, requires the unambiguous identification of the true author of each argument, item of evidence, deduction and opinion. Therefore, the following declaration must be included and signed by the author:

**I declare that this thesis is my original work, except where stated otherwise. This thesis has never been submitted for any degree or examination to any other University.**

.....(Signature)

This declaration constitutes an assertion that full and accurate references and citations have been included for all material, directly included and indirectly contributing to the MSc Dissertation.

#### **3.5.5.7 Listed References**

References to be given in numerical order and in full, for example:

- [1] **BATES, D.R., *Atomic and molecular processes*, (Academic Press, 1968), p.79.**
- [2] **SNELSON, R.A. and LUCAS, J., *Longitudinal diffusion coefficient for electron swarms at low E/p*, IEE Conf. Publ., 90, 1972, p.23-30.**
- [3] **LOWKE, J.J., The drift velocity of electrons in hydrogen and nitrogen, *Aust. J. Phys.*, 1962, 316 pp. 15-35**

Scrutinise the referencing given in recent IIE publications and note in particular the type styles and punctuation. In thesis text, refer to specific reference(s) as: "...previous work in [1] demonstrated...", or "according to [3-5], it can be concluded..."

One function of a cited reference is to enable a reader to consult the original source, for confirmation of matters relating to your use of the reference and for additional details. Many web pages have an ephemeral existence, more so than equivalent printed sources. If the equivalent information is available from a printed source, cite that.

Another function of a citation is to invoke the authority of the cited source as support for your assertions and arguments. Bear in mind that sources of information are not all to be given the same credence. This applies equally to spoken, printed and electronically delivered information. Be critical of the quality and veracity of all information, however it is published. Web pages are produced for a wide variety of reasons, with advertising and other forms of commercial promotion being some of the most common. As a consequence, such information may be presented in a way which is accidentally or deliberately misleading. Many websites are not what they may appear to be; do not rely on an apparently obvious word or phrase in a URL to identify the source of the information. You should establish the real identity of the author of any information cited, and the owner of the site whence the webpage is made available. Try not to use various on-line "wiki" sources.

Similar comments apply to the different quality of information to be expected from refereed journals and the proceedings of highly regarded conferences, books, the proceedings of minor conferences and colloquia, and newspaper and magazine articles. Consult your supervisor for guidance regarding the credibility of your cited sources of information.

If you decide to use a webpage as a reference, you should include the following details:

- The complete URL for the original webpage being cited (Do not cite a URL which merely gives an indirect link to the original source).
- The verified author of the information.
- The author's affiliation(s) appropriate to the material cited.
- The verified owner of the website.
- The date of composition (or most recent update) of the webpage and the date the page is accessed.

#### **3.5.5.8 Copying and Binding**

Soft-back theses printing and binding services are available at the David Hume Tower and King's Buildings copy centres.

**David Hume Tower Copy Centre**  
Basement

**King's Buildings Copy Centre**  
Room 2300, James Clerk Maxwell Building (JCMB)

### **3.5.6 Day-Books**

#### **3.5.6.1 Nature and Extent of Records**

A Day-Book, written in English, should be kept for your MSc Dissertation, or any other block of practical work which you undertake.

The day-book is a diary, a journal, a day by day or even hour by hour record of the work which you do in the pursuit of the objectives of your Dissertation work. In it, you should make an accurate and comprehensive record of your activities, the resources used, what databases were consulted and how (what search terms in what fields, what settings etc.), what papers you read, how you developed your methods, the results obtained and such notes on interpretation, planning and other organisation of the work, that another person, conversant with the area of your work, could use to reconstruct your activities, in full. The day-book records success, as well as failure.

You may usually expect your day-book to be inspected and commented on at regular intervals, e.g. by a supervisor or laboratory demonstrator. When this happens, ensure that supervisor review can be readily traced, either via signature and date, or by other digital means e.g., timestamped screenshots of the review process.

#### **3.5.6.2 Functions of the Day-Book**

- It records good ideas and bad ideas.
- It records leads which produce breakthroughs, as well as those which go nowhere.
- It records decisions to do things and decisions to not do things.
- It records things which are undecided.
- It records how tests were set up.
- It records raw results, as tables, technical sketches, graphs, etc.
- It records references to sources of ideas and information.
- It is a chronological record; one made at the time and place of the activity. Thus, you cannot tell what the interpretation, good or bad, of a given record of action will be. The analysis and interpretation (and the records of such) usually come later.
- It is not a formal report, neatly written up after the event, edited to produce a consistent and logical flow of ideas and actions. It is life in the raw and the creation in the making. It contains working notes, made as thoughts and plans are conceived, modified in real time as the ideas develop. It is a book of rough working. However, all records should be legible and text should be written in English.
- The records in a day-book are dated.
- The pages are numbered.
- There are no gaps "to be filled in later". If a line of thought or investigation is suspended, to be resumed later, the date, time and page number information is used to cross-reference, and so link, the related records (it is acceptable to go back and add in a forward reference, as well as making a backward reference, when resuming something).
- By following your day-book, another person should be able to reconstruct (literally, if necessary) all the work which you have performed, in the order in which you performed it.

#### **3.5.6.3 Physical Characteristics**

- Your name and matriculation number should be clearly shown (physical Day-Book) or clearly findable (digital Day-Book) on the Day-Book.
- The day-book must also provide reasonable assurance of authenticity, in that it should not be possible to easily swap in, or swap out contents and content should be time-traceable, i.e., to show clearly and reliably when content was created in the process of your research.
- If you prefer to use a physical Day-Book some conditions apply:  
A physical Day-Book must be an A4 notebook with sewn and glued binding (not stapled, or loose, or removable leaf, or spiral bound). It has to stand up to prolonged continuous use without losing leaves or integrity.

A physical Day-Book must also provide reasonable assurance of authenticity, in that it should not be possible to easily remove a leaf from it and substitute it with another. If you need to attach inserts (e.g. printed graphs, diagrams, annotated sections of computer program, photocopied data, etc.) you are recommended to staple them in, or to ensure that the glue you use will remain secure for at least a year after the last record is made.

**IMPORTANT REMINDER: Please refer to the sections of the Handbook and University web pages where plagiarism is discussed, to be sure about the writing and citation styles.**