School of Engineering

Engineering with Management MAI
Year 5
Handbook 2019-2020
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Note:
Alternative formats of the handbook can be made available on request. All students are encouraged to fully familiarise themselves with college rules and general regulations which can be found here:


In the event of any conflict or inconsistency between the General Regulations published in the University Calendar and information contained in programme or local handbooks, the provisions of the General Regulations in the Calendar will prevail.
1. Introduction

Welcome
Welcome back to the Department for your fifth year of study in College. This is an extremely important year for you all and it will be a busy one with opportunities to take advanced courses and the highlight being the research project.

With various mostly good and perhaps occasionally bad habits developed over the previous years, we can say now with certainty that it is extremely important that you organise and use your time responsibly and effectively in this MAI year in order to balance the subject and associated course work, with the demands from the project, and potential job applications etc. We encourage you to get started immediately on your project and spend at least 16-20 hours/week in the first semester ensuring that you can achieve a reasonable level of success. We have facilitated this will large deliberate gaps in the timetable to allow you to spend focussed time on the project in College. In general, you should aim to work for about 40 hours/week on your studies. With about 12 hours timetabled, this means a minimum of 28 hours of private study between project and subjects.

The opportunity to engage with staff now in the advanced courses is usually very rewarding and the formality of the relationship between the staff and the student lessens as the students get to know the staff’s research interests and often end up working closely in the research groups.

We wish you the best of luck in this academic year.

Professor Ciaran Simms
Head of Discipline
Mechanical & Manufacturing Engineering

Professor Garret O’Donnell
Academic Director
Engineering with Management
September 2019.
2. Contacts

2.1 Coordinator

Professor Garret O'Donnell – Engineering with Management Course Director
Garret.ODonnell@tcd.ie
Professor Rocco Lupoi/Professor Garret O'Donnell- MAI EwM Coordinator for
Engineering with Management
LupoiR@tcd.ie

2.2 Administrative contacts

Nicole Byrne – Executive Officer (Part-time) – Engineering with Management
nbyrne3@tcd.ie

Judith Lee – Senior Executive Officer – Mechanical & Manufacturing
Engineering
julee@tcd.ie
2.3 Discipline overview/structure
3. Key dates

3.1 Academic year calendar

<table>
<thead>
<tr>
<th>Academic Calendar Week</th>
<th>WkR beginning</th>
<th>2019/20 Academic Year Calendar</th>
<th>Term / Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26-Aug-19</td>
<td>Assessment* (Semesters 1 &amp; 2)</td>
<td>Winter Term begins/ Semester 1 begins</td>
</tr>
<tr>
<td>2</td>
<td>02-Sep-19</td>
<td>Orientation (undergraduate), Matric/Results</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>3</td>
<td>09-Sep-19</td>
<td>Teaching and Learning</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>4</td>
<td>16-Sep-19</td>
<td>Teaching and Learning</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>5</td>
<td>23-Sep-19</td>
<td>Teaching and Learning</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>6</td>
<td>30-Sep-19</td>
<td>Teaching and Learning</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>7</td>
<td>07-Oct-19</td>
<td>Teaching and Learning</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>8</td>
<td>14-Oct-19</td>
<td>Teaching and Learning</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>9</td>
<td>21-Oct-19</td>
<td>Study/Review</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>10</td>
<td>28-Oct-19</td>
<td>Teaching and Learning (Monday, Public Holiday)</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>11</td>
<td>04-Nov-19</td>
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<td>Winter Term begins</td>
</tr>
<tr>
<td>12</td>
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<td>Winter Term begins</td>
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<tr>
<td>13</td>
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<td>Teaching and Learning</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>15</td>
<td>02-Dec-19</td>
<td>Revision</td>
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</tr>
<tr>
<td>16</td>
<td>09-Dec-19</td>
<td>Assessment*</td>
<td>Winter Term ends</td>
</tr>
<tr>
<td>17</td>
<td>16-Dec-19</td>
<td>Christmas Period - College Closed</td>
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</tr>
<tr>
<td>18</td>
<td>23-Dec-19</td>
<td>31 December 2019 to 1 January 2020 inclusive</td>
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<tr>
<td>19</td>
<td>30-Dec-19</td>
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<td>Winter Term ends</td>
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<td>20</td>
<td>06-Jan-20</td>
<td>Foundation Scholarship Examinations*</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>21</td>
<td>13-Jan-20</td>
<td>Marking/Results</td>
<td>Winter Term begins</td>
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<tr>
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<tr>
<td>24</td>
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<td>Winter Term begins</td>
</tr>
<tr>
<td>28</td>
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<td>Study/Review</td>
<td>Winter Term begins</td>
</tr>
<tr>
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<td>09-Mar-20</td>
<td>Teaching and Learning</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>30</td>
<td>16-Mar-20</td>
<td>Teaching and Learning (Tuesday, Public Holiday)</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>31</td>
<td>23-Mar-20</td>
<td>Teaching and Learning</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>32</td>
<td>30-Mar-20</td>
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<td>Winter Term begins</td>
</tr>
<tr>
<td>33</td>
<td>06-Apr-20</td>
<td>Teaching and Learning</td>
<td>Winter Term begins</td>
</tr>
<tr>
<td>34</td>
<td>13-Apr-20</td>
<td>Revision (Monday, Easter Monday)</td>
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<td>35</td>
<td>20-Apr-20</td>
<td>Easter Week</td>
<td>Easter Term begins</td>
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<tr>
<td>36</td>
<td>27-Apr-20</td>
<td>Assessment*</td>
<td>Easter Term ends</td>
</tr>
<tr>
<td>37</td>
<td>04-May-20</td>
<td>Marking/Results (Monday, Public Holiday)</td>
<td>Easter Term ends</td>
</tr>
<tr>
<td>38</td>
<td>11-May-20</td>
<td>Marking/Results</td>
<td>Easter Term ends</td>
</tr>
<tr>
<td>39</td>
<td>18-May-20</td>
<td>Marking/Results</td>
<td>Easter Term ends</td>
</tr>
<tr>
<td>40</td>
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</tr>
<tr>
<td>41</td>
<td>03-Jun-20</td>
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<td>42</td>
<td>10-Jun-20</td>
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<td>Easter Term ends</td>
</tr>
<tr>
<td>43</td>
<td>17-Jun-20</td>
<td>Research</td>
<td>Easter Term ends</td>
</tr>
<tr>
<td>44</td>
<td>24-Jun-20</td>
<td>Research</td>
<td>Easter Term ends</td>
</tr>
<tr>
<td>45</td>
<td>01-Jul-20</td>
<td>Research</td>
<td>Easter Term ends</td>
</tr>
<tr>
<td>46</td>
<td>08-Jul-20</td>
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</tr>
<tr>
<td>47</td>
<td>15-Jul-20</td>
<td>Research</td>
<td>Easter Term ends</td>
</tr>
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<td>48</td>
<td>22-Jul-20</td>
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<td>Easter Term ends</td>
</tr>
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<td>49</td>
<td>29-Jul-20</td>
<td>Research</td>
<td>Easter Term ends</td>
</tr>
<tr>
<td>50</td>
<td>05-Aug-20</td>
<td>Research (Monday, Public Holiday)</td>
<td>Easter Term ends</td>
</tr>
<tr>
<td>51</td>
<td>12-Aug-20</td>
<td>Research</td>
<td>Easter Term ends</td>
</tr>
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<td>52</td>
<td>19-Aug-20</td>
<td>Research</td>
<td>Easter Term ends</td>
</tr>
<tr>
<td>53</td>
<td>26-Aug-20</td>
<td>Research</td>
<td>Easter Term ends</td>
</tr>
</tbody>
</table>

*Note: Some contingency days may be required outside of the formal assessment/assessament weeks.

Note: It may be necessary to hold some exams in the preceding weeks.
3.2 Teaching weeks
Semester 1: 9th September to 29th November 2019
Semester 2: 20th January to 10th April 2020

3.3 Exam dates
Semester 1 examinations: 9th to 13th December 2019*
Semester 2 examinations: 27th April to 1st May 2020*
Reassessment – Semesters 1 & 2: 24th to 28th August 2020*
*Note: extra contingency days may be required outside of the formal
assessment/reassessment weeks

3.4 Submission dates for projects and coursework

Individual staff will inform you of appropriate dates during their introductory
lectures and will keep you informed via Blackboard of changes.

<table>
<thead>
<tr>
<th>ME5E1 Assessment components and dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
</tr>
<tr>
<td>------</td>
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<tr>
<td>Project Plan</td>
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<tr>
<td>Interim Report</td>
</tr>
<tr>
<td>Thesis</td>
</tr>
<tr>
<td>Viva-Voce Presentation &amp; Examination</td>
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</tbody>
</table>
## 5E1 Thesis Marking Guidelines

<table>
<thead>
<tr>
<th>(%)</th>
<th>Descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100</td>
<td>Exceptional project report showing broad understanding of the project area and exceptional knowledge of the relevant literature. Exemplary presentation and analysis of results, logical organisation and ability to critically evaluate and discuss results coupled with insight and novelty/originality. Exemplary project report of publishable quality (e.g. peer reviewed scientific journal/patent application in-progress).</td>
</tr>
<tr>
<td>80-89</td>
<td>An excellent project report clearly showing evidence of wide reading far above that of an average student, with excellent presentation and in-depth analysis of results. Clearly demonstrates an ability to critically evaluate and discuss research findings in the context of relevant literature. Obvious demonstration of insight and novelty/originality. An excellently executed report overall of publishable quality (e.g. short peer reviewed conference paper such as IEEE in-progress) with very minor shortcomings in some aspects.</td>
</tr>
<tr>
<td>70-79</td>
<td>A very good project report showing evidence of wide reading, with clear presentation and thorough analysis of results and an ability to critically evaluate and discuss research findings in the context of relevant literature. Clear indication of some insight and novelty/originality. A very competent and well-presented report overall but falling short of excellence in some aspects. Sufficient quality/breadth of work similar to requirements for an abstract at a scientific conference.</td>
</tr>
<tr>
<td>60-69</td>
<td>A good project report which shows a reasonably good understanding of the problem and some knowledge of the relevant literature. Mostly sound presentation and analysis of results but with occasional lapses. Some relevant interpretation and critical evaluation of results, though somewhat limited in scope. General standard of presentation and organisation adequate to good.</td>
</tr>
<tr>
<td>50-59</td>
<td>A moderately good project report which shows some understanding of the problem but limited knowledge and appreciation of the relevant literature. Presentation, analysis and interpretation of the results at a basic level and showing little or no novelty/originality or critical evaluation. Insufficient attention to organisation/presentation of report.</td>
</tr>
<tr>
<td>40-49</td>
<td>A weak project report showing only limited understanding of the problem and superficial knowledge of the relevant literature. Results presented in a confused or inappropriate manner and incomplete or erroneous analysis. Discussion and interpretation of result severely limited, including some basic misapprehensions, and lacking any novelty/originality or critical evaluation. General standard of presentation poor.</td>
</tr>
<tr>
<td>20-39</td>
<td>An unsatisfactory project containing substantial errors and omissions. Very limited understanding, or in some cases misunderstanding of the problem and very restricted and superficial appreciation of the relevant literature. Very poor, confused and, in some cases, incomplete presentation of the results and limited analysis of the results including some serious errors. Severely limited discussion and interpretation of the results revealing little or no ability to relate experimental results to the existing literature. Very poor overall standard of presentation.</td>
</tr>
<tr>
<td>0-19</td>
<td>A very poor project report containing many errors, with almost no understanding of the problem and the literature pertaining to it. Chaotic presentation of results, and in some cases non-existent or inappropriate or plainly wrong analysis. Discussion and interpretation seriously confused or wholly erroneous revealing basic misapprehensions.</td>
</tr>
</tbody>
</table>
4. Key locations

5. Timetable

https://www.tcd.ie/mecheng/engman/assets/pdf/MAI(EwM)_timetable1920.pdf
6. Programme overview

6.1 Engineering course structure

* Students who take the internship and successfully complete the Senior Sophister year are eligible to exit with the BSc (Ing) degree.

The integrated BSc(Ing)/MAI degree programme is professionally accredited by Engineers Ireland and meets the educational requirements for corporate
membership of this professional institution and registration as a chartered engineer. Further information can be found at:

http://www.engineersireland.ie/Membership.aspx

6.2 Award routes
Engineering with Management students who exit the course having obtained credit for years one to four of the course are entitled to the award of the degree of B.Sc. (Ing.). The B.Sc. (Ing) degree award is based on an overall average mark calculated by combining the average mark achieved in the Junior Sophister examinations (20% towards overall average) and the Senior Sophister examinations (80% towards overall average).

Those Engineering with Management students who have obtained credit for the fifth year of the course are additionally entitled to the degree of M.A.I. (St.). All degrees referred to above must be conferred at the same Commencements. Students are not permitted by College regulations to have their B.A.I. or B.Sc. (Ing.) conferred and then to return to College at a later time to complete the fifth year of their course.

6.3 Eligibility for MAI
- Note: students must pay a tuition fee for the MAI year:
  https://www.tcd.ie/academicregistry/fees-and-payments/
- Students must achieve a minimum overall mark of 55% for the combined Junior Sophister and Senior Sophister years (on a 20:80* basis) at the annual session of the B.A.I. / B.Sc. degree year.

6.4 Eligibility for Internship and study abroad
In order to be eligible to apply for an international exchange in the Senior Sophister year or to apply for the 4E4 Industrial Partnership/Internship module in the second semester of the Senior Sophister year, students must have a minimum grade of II.1 (60 – 69%) at the first sitting of the Junior Sophister Engineering examinations. Those required to sit supplemental Junior Sophister Engineering examinations will be deemed ineligible to apply. No exceptions to this rule will be considered.
Study abroad opportunities can be viewed here:
https://www.tcd.ie/Engineering/international/outgoing/

Information on taking an internship can be viewed here:
https://www.tcd.ie/mecheng/engman/assets/pdf/4E4_B.pdf

6.5 School of Engineering Examination Regulations

6.6 External Examiner
Professor Joseph Butterfield, Queen's University Belfast
7. Programme learning outcomes

The Discipline’s main objective with regard to the engineering with management programme is the pursuit of excellence in teaching and research in engineering with management with the central aim of producing graduate engineers with a capacity for independent thought in problem solving and creative analysis & design together with strong business and management context.

To achieve this, we must:

- instill in students an enthusiasm for the art and practice of Engineering contextualized by business and management principles
- teach the engineering science and mathematics which underpin the subject areas of Mechanical & Manufacturing Engineering
- demonstrate the application of these principles to the analysis, synthesis and design of engineering components and systems;
- foster the development of team working skills;
- encourage students to exercise critical judgement and develop the communication skills necessary to make written and oral presentations of their work.

These objectives are underpinned by:

- undertaking both basic and applied research
- building strong industry links in collaborative projects at graduate and undergraduate levels
- provision of advanced facilities for students to undertake graduate research degrees
- the development of academic staff in teaching and research by ensuring that adequate resources are available to assist them
- ensuring that the research work is of the highest international standard by participation in international conferences and publication in learned journals

In addition, we must consider the requirements of the relevant professional institutions and the needs of Irish and European industry in the undergraduate curriculum.
8. Graduate Attributes
Throughout their time at Trinity, our students will be provided with opportunities to develop and evidence achievement of a range of graduate attributes that support their academic growth. Graduate attributes can be achieved in academic and co- and extra-curricular activities.

Trinity Graduate Attributes

To Act Responsibly
A Trinity Graduate
- Acts on the basis of knowledge and understanding
- Is self-motivated and able to take responsibility
- Knows how to deal with ambiguity
- Is an effective participant in teams
- Has a global perspective
- Is ethically aware

To Develop Continuously
A Trinity Graduate
- Has a passion to continue learning
- Builds and maintains career readiness
- Commits to personal development through reflection
- Has the confidence to take measured risks
- Is capable of adapting to change

To Think Independently
A Trinity Graduate
- Has a deep knowledge of an academic discipline
- Can do independent research
- Thinks creatively
- Thinks critically
- Appreciates knowledge beyond their chosen field
- Analyses and synthesises evidence

To Communicate Effectively
A Trinity Graduate
- Can present work through all media
- Is expert in the communication tools of a discipline
- Connects with people
- Listens, persuades and collaborates
- Has digital skills
- Has language skills
9. General programme information
9.1 Modules and module descriptors
Module choice forms with themes of Energy, Mechanical/Manufacturing and Bio/Manufacturing were used to build a subject area progression.

<table>
<thead>
<tr>
<th>Code</th>
<th>Module Title</th>
<th>ECTS</th>
<th>Semester</th>
<th>Coordinator</th>
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<tbody>
<tr>
<td>5E1</td>
<td>Mechanical Engineering Research Project</td>
<td>25</td>
<td>1 &amp; 2</td>
<td>Garret O'Donnell</td>
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<tr>
<td>ME5E2/MEU44E03</td>
<td>Research Methods</td>
<td>5</td>
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<td>Gareth Bennett</td>
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<td>ME5B09</td>
<td>Control Engineering</td>
<td>5</td>
<td>1</td>
<td>Dermot Geraghty</td>
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<td>ME5MM3</td>
<td>Supply Chain Management</td>
<td>5</td>
<td>1</td>
<td>Garret O'Donnell</td>
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<tr>
<td>ME5MM7</td>
<td>Risk Management &amp; Safety Assessment Systems</td>
<td>5</td>
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<td>Garret O'Donnell Chiara Leva</td>
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<tr>
<td>CE7J04</td>
<td>Energy Policy &amp; Demand</td>
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<td>1</td>
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<tr>
<td>CE&amp;T01</td>
<td>Transportation</td>
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<td>ME5E4</td>
<td>Introduction to Computational Fluid Mechanics</td>
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<td>Seamus O'Shaughnessy</td>
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<td>ME5BIO4</td>
<td>Finite Element Analysis</td>
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<td>ME5B03</td>
<td>Advanced Thermal Fluid Design</td>
<td>10</td>
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<td>ME5B10</td>
<td>Instrumentation &amp; Experimental Techniques</td>
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<td>2</td>
<td>Dermot Geraghty</td>
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<td>5MEMS1</td>
<td>Micro &amp; Precision Manufacturing</td>
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<td>2</td>
<td>Rocco Lupoi</td>
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<td>Breiffni Fitzgerald</td>
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<td>Wave &amp; Hydro Energy</td>
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<td>STU45006</td>
<td>Strategic Information Systems</td>
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Module descriptors are available at the following link:

https://www.tcd.ie/mecheng/engman/current/y5-MAI.php
9.2 Laboratories
Students are expected to keep a logbook recording the details of every experiment performed and to write a technical report about each experiment. Each student is required to submit her/his report neatly presented and by the date specified to avoid penalty. Guidelines as to the required length and format of each report will be specified by the lecturer concerned. Laboratory groups and timetable will be published at the beginning of the semester. Please note that you must attend the particular laboratory sessions to which you have been assigned. Students cannot swap sessions because of the complexity of the timetable, the large numbers in the year and the limited accommodation available.

A no show at a lab may result in a zero mark even if a report is submitted. No report submitted may mean a zero mark even if the lab was attended. Labs cannot be taken in the summer/autumn periods if missed during the year.

Laboratory Timetables: Laboratory timetables will be forwarded to students via email and posted on the noticeboards in Parsons Building.

9.3 Coursework requirements

9.3.2 Policy on late submission
Coursework and assessment is an essential part of a student’s learning to reinforce aspects of module content. For all years and ALL modules within the Discipline of Engineering with Management the following applies:

Individual Coursework
1. Coursework received within two weeks of the due date will be graded, but a penalty will be applied

   • Up to 1 week late = minus 15%
   • From 1 week to 2 weeks late = minus 25%

2. Any submissions received two weeks after the due date will not be accepted and will receive a zero grade.
3. Submission dates may be extended in exceptional and extenuating circumstances. Students must apply directly (via email) to the module
coordinator requesting an extension and provide an explanation and/or evidence for such (e.g. medical cert). Please note that the module coordinator reserves the right to refuse granting of an extension.

**Group Coursework**

1. The same penalties for late submissions will apply to group coursework as outlined for “Individual Coursework”.
2. In addition, certain modules may also adopt an additional grading scheme whereby group projects/assignments will be graded as a function of lecture attendance. Please consult module coordinator.

**9.3.3 Policy on participation in continuous assessment-based modules**

Students who are absent from a third of their lectures, tutorials or labs of a continuous assessment-based module or who fail to submit a third of the required coursework will be deemed non-satisfactory.

Students reported as non-satisfactory for both semesters of a given year may be refused permission to take their examinations and may be required by the Senior Lecturer to repeat the year.

Further details of the procedure for reporting a student as non-satisfactory can be viewed on the [College Undergraduate Studies](#) website.
10 Prizes and Scholarships

10.1 Foundation Scholarship
Foundation Scholarship is a College institution with a long history and high prestige. The objective of the Foundation Scholarship examination is to identify students who, at a level of evaluation appropriate to the Senior Freshman year, can consistently demonstrate exceptional knowledge and understanding of their subjects.

The questions that are asked in the engineering scholarship exams are very challenging. They test a student’s ability to think laterally, to solve unfamiliar problems and to tackle problems from first principles. Although the syllabi for the scholarship exams and the end of year exams are the same, the nature of the questions in the scholarship exams is more challenging. A good scholarship question will require a creative leap or a deep insight of the fundamental principles. The most important skill that is developed in an engineering education is problem solving. The most difficult problems to solve are those that are unfamiliar, that require a fundamental understanding of the basic principles and that require the student to make a creative or innovative leap.

Senior Freshman Engineering with Management students take the following three-hour exams:
- Engineering Science I: General mathematics, management and computer science
- Engineering Science II: General mechanics and materials
- Engineering Science III: General manufacturing and electricity

Further information is available at the following link:
https://www.tcd.ie/Engineering/undergraduate/foundation/.
10.2 Prizes

BOOK PRIZES
A prize of a book token to the value of €13 is awarded to candidates who obtain a standard equivalent to an overall first class honors grade (70% and above) at the first attempt of the semester 1 and semester 2 assessment. Book Prizes will be available for collection in November of the following academic year from the Academic Registry. These prizes are issued in the form of book tokens and can be redeemed at Hodges Figgis and Co. Ltd.

E.R. STUART PRIZE IN ENGINEERING
This prize, established in 1982 from funds subscribed by colleagues to mark Mr E. R. Stuart’s retirement, is awarded to the first year engineering student who is judged by the School of Chemistry to have given the best performance in the first year engineering chemistry module of that year. Value, €200.

VICTOR W. GRAHAM PRIZES
These prizes, founded in 1986 from funds subscribed by friends and pupils to mark Mr V.W. Graham’s retirement, are awarded to the first year engineering student who obtains the highest marks in engineering mathematics (modules 1E1 and 1E2) at the annual class examination and to the second year engineering student who obtains the highest mark in engineering mathematics (modules 2E1 and 2E2) at the regular annual class examination. Value, first year prize €750, second year prize €1,000.

10.3 Scholarships

KINSELLA SCHOLARSHIP
This scholarship was established in 2016 by Barbara and Eric Kinsella, Chairman of Jones Engineering Group. The scholarships are awarded to students in their Senior Freshman year. Valued at €5,000 per annum, each scholarship will be renewed annually for the duration of the student’s studies. The scholarships will be awarded on the basis of marks obtained in the Engineering Project Design modules with selected students being invited to go forward to an interview stage.
Preference will be given to candidates not already holding scholarship awards of significant value.

11. Health and Safety
We operate a ‘safe working environment’ policy and we take all practical precautions to ensure that hazards or accidents do not occur. We maintain safety whilst giving you the student very open access to facilities. Thus safety is also your personal responsibility and it is your duty to work in a safe manner. By adopting safe practices you ensure both your own safety and the safety of others.

Please read the following Safety Documents for working practices in the Disciplines of Mechanical and Manufacturing Engineering:
(https://www.tcd.ie/mecheng/assets/pdf/Safety_Statement.pdf)
and in the Department of Electronic and Electrical Engineering:
(http://www.mee.tcd.ie/safety/SS2012.pdf)

If you are working in Trinity Centre for Bioengineering Laboratories in Trinity Biomedical Sciences Institute, please contact Mr Simon Carroll, Senior Technical Officer at scarrol6@tcd.ie to complete necessary Health and Safety paperwork prior to completing any laboratory work. Please ensure you comply with the instructions given in these important documents. Failure to behave in a safe manner may result in you being refused the use of discipline facilities.
12. Student Supports
Trinity College provides a wide range of personal and academic supports for its students.

12.1 Tutors
A tutor is a member of the academic staff who is appointed to look after the general welfare and development of the students in his or her care. Whilst your tutor may be one of your lecturers, the role of tutor is quite separate from the teaching role. Tutors are a first point of contact and a source of support, both on arrival in college and at any time during your time in college. They provide confidential help and advice on personal as well as academic issues or on anything that has an impact on your life. They will also, if necessary, support and defend your point of view in your relations with the college. If you cannot find your own tutor, you can contact the Senior Tutor (tel: 01 896 2551). Senior Tutor's website: https://www.tcd.ie/seniortutor/

12.2 Student Counselling Service
The Student Counselling Service, 3rd Floor, 7-9 South Leinster Street, College.
Opening hours: 9:15 am to 5:10 pm Monday to Friday during lecture term.
Tel: 01 896 1407
Email: student-counselling@tcd.ie
Web: http://www.tcd.ie/Student_Counselling.

12.3 College Health Service
The Health Centre is situated on Trinity Campus in House 47, a residential block adjacent to the rugby pitch.
Opening hours: 09.00 - 16.40 with emergency clinics from 09.00 - 10.00.
Tel: 01 896 1591 or 01 896 1556
Web: https://www.tcd.ie/collegehealth/
12.4 Chaplaincy
The Chaplains are representatives of the main Christian Churches in Ireland who work together as a team, sharing both the college chapel and the chaplaincy in House 27 for their work and worship.

Steve Brunn (Anglican Chaplain): brunns@tcd.ie; tel: 01 896 1402
Julian Hamilton (Methodist Chaplain): julian.hamilton@tcd.ie; tel: 01 896 1901
Alan O'Sullivan (Catholic Chaplain): aeosulli@tcd.ie; tel: 01 896 1260
Peter Sexton (Catholic Chaplain): sextonpe@tcd.ie; tel: 01 896 1260
Web: https://www.tcd.ie/Chaplaincy/

12.5 Trinity Disability Service
Declan Treanor, Disability Services Coordinator
Room 3055, Arts Building
Email: mdtreanor@tcd.ie
Tel: 01 896 3475
Web: https://www.tcd.ie/disability/

12.6 Niteline
A confidential student support line run by students for students which is open every night of term from 9pm to 2.30am.
Tel: 1800 793 793
Web: https://niteline.ie/

12.7 Students’ Union Welfare Officer
House 6, College
Email: welfare@tcdsu.org
Web: https://www.tcdsu.org/welfare

12.8 Maths Help Room
The Maths Help Room offers free assistance to students who are having difficulty with Mathematics, Statistics or related courses. It runs every week of term and at certain times out of term. The Maths help-room is a drop in centre, where you can bring in a maths or stats question and get some help.
The Helproom is located in the New Seminar Room in House 20 in the School of Mathematics in the Hamilton Building.
Web: https://www.maths.tcd.ie/Info_for_Schools/Maths_Helproom.php

12.9 Undergraduate Programming Centre
The Programming Centre is available to all Computer Engineering students free of charge. The centre operates as a drop-in service where you can get help with any problems you might have with programming in your courses. For further information, please visit http://www.scss.tcd.ie/ugpc/.

12.10 Student Learning Development
Student Learning Development provides learning support to help students reach their academic potential. They run workshops, have extensive online resources and provide individual consultations. To find out more, visit their website at https://student-learning.tcd.ie/.

12.11 Student 2 Student (S2S)
S2S offers trained Peer Supporters for any student in the College who would like to talk confidentially with another student, or just to meet a friendly face for a chat. This service is free and available to everyone. To contact a Peer Supporter you can email student2student@tcd.ie. Web: https://student2student.tcd.ie/peer-support/.

12.13 Trinity Careers Service
As a Trinity College Dublin student you have access to information, support and guidance from the professional team of expert Careers Consultants throughout your time at Trinity. The support offered includes ‘next step’ career guidance appointments, CV and LinkedIn profile clinics and practice interviews. The Trinity Careers Service and the School of Engineering also hold an annual Careers Fair in October which gives students the opportunity to find out about career prospects in over fifty companies. Web: https://www.tcd.ie/Careers/

12.14 Co-curricular activities
Trinity College has a significant number of diverse student societies which are
governed by the Central Societies Committee. They provide information on the societies including how to get involved and even how to start your own society. See http://trinitysocieties.ie/ for more details. Students are encouraged to get involved.

Trinity College also has a huge range of sports clubs which are governed by the Dublin University Athletic Club (DUCAC). See http://www.tcd.ie/Sport/student-sport/ducac/?nodeId=94&title=Sports_Clubs for more details.

12.15 Trinity College Students’ Union
The Trinity College Students’ Union (TCDSU) is run for students by students. TCDSU represent students at college level, fight for students' rights, look after students' needs, and are here for students to have a shoulder to cry on or as a friend to chat with over a cup of tea. Students of Trinity College are automatically members of TCDSU. It has information on accommodation, jobs, campaigns, as well as information pertaining to education and welfare. For more information see https://www.tcdsu.org/.

13. General Regulations

13.1 Attendance requirements
Please note that attendance at lectures, tutorials and laboratory sessions is mandatory as is the submission of all work subject to continuous assessment. Students who prove lacking in any of these elements may be issued with a Non-Satisfactory form and asked for an explanation for their poor attendance or performance. Students who do not provide a satisfactory explanation can be prevented from sitting the annual examinations. The following is an extract from the College Calendar outlining the College policy on attendance and related issues:

18 Students must attend College during the teaching term. They must take part fully in the academic work of their class throughout the period of their
course. Lecture timetables are published through my.tcd.ie and on school or department notice-boards before the beginning of Michaelmas teaching term. The onus lies on students to inform themselves of the dates, times and venues of their lectures and other forms of teaching by consulting these timetables.

19 The requirements for attendance at lectures and tutorials vary between the different faculties, schools and departments. Attendance is compulsory for Junior Freshers in all subjects. The school, department or course office, whichever is relevant, publishes its requirements for attendance at lectures and tutorials on notice-boards, and/or in handbooks and elsewhere, as appropriate. For professional reasons lecture and tutorial attendance in all years is compulsory in the School of Engineering, the School of Dental Science, the School of Medicine, the School of Nursing and Midwifery, the School of Pharmacy and Pharmaceutical Sciences, for the B.S.S. in the School of Social Work and Social Policy, and for the B.Sc. in Clinical Speech and Language Studies. Attendance at practical classes is compulsory for students in all years of the moderatorship in drama and theatre studies and drama studies two-subject moderatorship.

20 In special circumstances exemption from attendance at lectures for one or more terms may be granted by the Senior Lecturer; application for such exemption must be made in advance through the tutor. Students granted exemption from attendance at lectures are liable for the same annual fee as they would pay if attending lectures. Students thus exempted must perform such exercises as the Senior Lecturer may require. If these exercises are specially provided, an additional fee is usually charged.

21 Students who in any term have been unable, through illness or other unavoidable cause, to attend the prescribed lectures satisfactorily, may be granted credit for the term by the Senior Lecturer and must perform such supplementary exercises as the Senior Lecturer may require. The onus for informing the Senior Lecturer of illness rests with individual students who should make themselves familiar with the general and more detailed school or course regulations regarding absence from lectures or examinations through illness. In addition, issues with students may arise from time to
time, which in the opinion of the Senior Lecturer affect a student’s ability or suitability to participate in his or her course. If required by the Senior Lecturer, students (other than those subject to §28 below) are obliged to undergo a medical examination or assessment by a doctor or specialist nominated by the Senior Lecturer at the expense of the College for the purpose of obtaining an opinion as to the student’s medical fitness to continue with his/her studies or as to his/her ability or suitability to participate in his/her course to the standards required by the College. Students found to be unfit following such a medical examination or assessment may be required to withdraw until such times as they are deemed fit to resume their studies. Students who fail to attend such a medical examination or assessment within a reasonable period may be required by the Senior Lecturer to withdraw until such time as they attend the aforementioned medical examination or assessment and are deemed fit to resume their studies.

22 Students who are unable to attend lectures (or other forms of teaching) due to their disability should immediately contact the Disability Service to discuss the matter of a reasonable accommodation. Exceptions to attendance requirements for a student, on disability grounds, may be granted by the Senior Lecturer following consultation with the student’s school, department or course office, and the Disability Service.

23 Students who find themselves incapacitated by illness from attending lectures (or other forms of teaching) should immediately see their medical advisor and request a medical certificate for an appropriate period. Such medical certificates should be copied to the school, department or course office, as appropriate, by the student’s tutor.

Course work

24 Students may be required to perform course work as part of the requirements of their course of study. The assessment of course work may be based on the writing of essays, the sitting of tests and assessments, attendance at practical classes and field trips, the keeping and handing in of practical books, the carrying out of laboratory or field projects, and the
satisfactory completion of professional placements. The school, department or course office, whichever is appropriate, publishes its requirements for satisfactory performance of course work on school notice-boards and/or in handbooks and elsewhere, as appropriate.

Non-satisfactory attendance and course work
25 All students must fulfil the course requirements of the school or department, as appropriate, with regard to attendance and course work. Where specific requirements are not stated, students may be deemed non-satisfactory if they miss more than a third of their course of study or fail to submit a third of the required course work in any term.

26 At the end of the teaching term, students who have not satisfied the school or department requirements, as set out in §§19, 24 and 25 above, may be reported as non-satisfactory for that term. Students reported as non-satisfactory for the Michaelmas and Hilary terms of a given year may be refused permission to take their annual examinations and may be required by the Senior Lecturer to repeat their year. Further details of procedures for reporting a student as non-satisfactory are given on the College website at:
https://www.tcd.ie/undergraduate-studies/academic-progress/attendance-course-work.php

13.2 Absence from examinations
The following is an extract from the College Calendar outlining the College policy on absence from Examinations:

35 Students who consider that illness may prevent them from attending an examination (or any part thereof) should consult their medical advisor and request a medical certificate for an appropriate period. If a certificate is granted, it must be presented to the student’s tutor within three days of the beginning of the period of absence from the examination. The tutor must immediately forward the certificate to the Senior Lecturer. Medical certificates must state that the student is unfit to sit examinations. Medical certificates will not be accepted in explanation for poor performance.
(a) Where a student becomes ill prior to the commencement of the annual examination, they may seek permission through their tutor from the Senior Lecturer to withdraw and take the supplemental examination in that year.

(b) Where illness prevents a student from completing any part of the annual examination and they withdraw from the examination, permission may be given for a supplemental examination to be taken in that year.

(c) Where illness occurs during the writing of an examination paper, it should be reported immediately to the chief invigilator. The student will then be escorted to the College Health Centre. Every effort will be made to assist the student to complete the writing of the examination paper.

Students who consider that other grave cause beyond their control may prevent them from attending an examination (or any part thereof) should consult their tutor who should make representations immediately to the Senior Lecturer that permission be granted for absence from the examination. Regulations (a) and (b) also apply in the case of absence from annual examinations due to other grave cause beyond a student’s control.

Regulations (a) and (b) apply only to examinations which are non-final non-degree examinations. However, regulations (a) and (b) apply in all years of those professional courses which permit supplemental examinations in final or degree years.

13.3 Plagiarism
In the academic world, the principal currency is ideas. As a consequence, you can see that plagiarism – i.e. passing off other people’s ideas as your own – is tantamount to theft. It is important to be aware the plagiarism can occur knowingly or unknowingly, and the offence is in the action not the intent.

Plagiarism is a serious offence within College and the College’s policy on plagiarism is set out in a central online repository hosted by the Library which is located at http://tcd.ie.libguides.com/plagiarism. This repository contains information on what plagiarism is and how to avoid it, the College Calendar entry on plagiarism and a matrix explaining the different levels of
plagiarism outlined in the Calendar entry and the sanctions applied.

Undergraduate and postgraduate new entrants and existing students, are required to complete the online tutorial ‘Ready, Steady, Write’. Linked to this requirement, all cover sheets which students must complete when submitting assessed work, must contain the following declaration:

I have read and I understand the plagiarism provisions in the General Regulations of the University Calendar for the current year, found at:
http://www.tcd.ie/calendar

I have also completed the Online Tutorial on avoiding plagiarism ‘Ready, Steady, Write’, located at http://tcd-ie.libguides.com/plagiarism/ready-steady-write

Plagiarism detection software such as “Turnitin” and Blackboard’s “SafeAssign” may be used to assist in automatic plagiarism detection. Students are encouraged to assess their own work for plagiarism prior to submission using this or other software.

13.4 University regulations, policies and procedures
Academic Policies - https://www.tcd.ie/teaching-learning/academic-policies/
Student Complaints Procedure - https://www.tcd.ie/about/policies/160722_Student%20Complaints%20Procedure_PUB.pdf

13.5 Data protection
A short guide on how College handles student data is available here: https://www.tcd.ie/info_compliance/data-protection/student-data/

14. General Information

14.1 Feedback and evaluation
The Staff/Student Liaison Committee meets once a semester to discuss matters of interest and concern to students and staff. It comprises class representatives from each year. A programme level survey is issued online to students towards the end of semester 2.
14.2 European Credit Transfer System (ECTS)
The European Credit Transfer and Accumulation System (ECTS) is an academic credit system based on the estimated student workload required to achieve the objectives of a module or programme of study. It is designed to enable academic recognition for periods of study, to facilitate student mobility and credit accumulation and transfer. The ECTS is the recommended credit system for higher education in Ireland and across the European Higher Education Area.

The ECTS weighting for a module is a measure of the student effort or workload required for that module, based on factors such as the number of contact hours, the number and length of written or verbally presented assessment exercises, class preparation and private study time, laboratory classes, examinations, clinical attendance, professional training placements, and so on as appropriate. There is no intrinsic relationship between the credit volume of a module and its level of difficulty.

The European norm for full-time study over one academic year is 60 credits. 1 credit represents 20-25 hours estimated student effort, so a 5-credit module will be designed to require 100-125 hours of student effort including class contact time, assessments and examinations.

ECTS credits are awarded to a student only upon successful completion of the programme year. Progression from one year to the next is determined by the programme regulations. Students who fail a year of their programme will not obtain credit for that year even if they have passed certain component. Exceptions to this rule are one-year and part-year visiting students, who are awarded credit for individual modules successfully completed.
14.3 Guidelines on Grades

The following Descriptors are given as a guide to the qualities that assessors are seeking in relation to the grades usually awarded. A grade is the anticipated degree class based on consistent performance at the level indicated by an individual answer. In addition to the criteria listed examiners will also give credit for evidence of critical discussion of facts or evidence.

Guidelines on Grades for Essays and Examination Answers

<table>
<thead>
<tr>
<th>Mark Rang</th>
<th>Criteria</th>
</tr>
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<tbody>
<tr>
<td>90-100</td>
<td>IDEAL ANSWER; showing insight and originality and wide knowledge. Logical, accurate and concise presentation. Evidence of reading and thought beyond course content. Contains particularly apt examples. Links materials from lectures, practicals and seminars where appropriate.</td>
</tr>
<tr>
<td>80-89</td>
<td>OUTSTANDING ANSWER; falls short of the 'ideal' answer either on aspects of presentation or on evidence of reading and thought beyond the course. Examples, layout and details are all</td>
</tr>
<tr>
<td>70-79</td>
<td>MAINLY OUTSTANDING ANSWER; falls short on presentation and reading or thought beyond the course but retains insight and originality typical of first class work.</td>
</tr>
<tr>
<td>65-69</td>
<td>VERY COMPREHENSIVE ANSWER; good understanding of concepts supported by broad knowledge of subject. Notable for synthesis of information rather than originality. Sometimes with evidence of outside reading. Mostly accurate and logical with appropriate examples. Occasionally a lapse in detail.</td>
</tr>
<tr>
<td>60-64</td>
<td>LESS COMPREHENSIVE ANSWER; mostly confined to good recall of coursework. Some synthesis of information or ideas. Accurate and logical within a limited scope. Some lapses in detail.</td>
</tr>
<tr>
<td>55-59</td>
<td>SOUND BUT INCOMPLETE ANSWER; based on coursework alone but suffers from a significant omission, error or misunderstanding. Usually lacks synthesis of information or ideas. Mainly logical and accurate within its limited scope and with lapses in detail.</td>
</tr>
<tr>
<td>Score Range</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>50-54</td>
<td>INCOMPLETE ANSWER; suffers from significant omissions, errors and misunderstandings, but still with understanding of main concepts and showing sound knowledge. Several lapses</td>
</tr>
<tr>
<td>45-49</td>
<td>WEAK ANSWER; limited understanding and knowledge of subject. Serious omissions, errors and misunderstandings, so that answer is no more than adequate.</td>
</tr>
<tr>
<td>40-44</td>
<td>VERY WEAK ANSWER; a poor answer, lacking substance but giving some relevant information. Information given may not be in context or well explained but will contain passages and words which indicate a marginally adequate understanding.</td>
</tr>
<tr>
<td>35-39</td>
<td>MARGINAL FAIL; inadequate answer, with no substance or understanding, but with a vague knowledge relevant to the</td>
</tr>
<tr>
<td>30-34</td>
<td>CLEAR FAILURE; some attempt made to write something relevant to the question. Errors serious but not absurd. Could also be a sound answer to the misinterpretation of a question.</td>
</tr>
<tr>
<td>0-29</td>
<td>UTTER FAILURE; with little hint of knowledge. Errors serious and absurd. Could also be a trivial response to the misinterpretation of a question.</td>
</tr>
</tbody>
</table>
## Guidelines on Marking Projects/Dissertation Assessment

<table>
<thead>
<tr>
<th>(%)</th>
<th>Descriptors</th>
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</thead>
<tbody>
<tr>
<td><strong>90-100</strong></td>
<td>Exceptional project report showing broad understanding of the project area and exceptional knowledge of the relevant literature. Exemplary presentation and analysis of results, logical organisation and ability to critically evaluate and discuss results coupled with insight and novelty/originality. Exemplary project report.</td>
</tr>
<tr>
<td><strong>80-89</strong></td>
<td>An excellent project report clearly showing evidence of wide reading far above that of an average student, with excellent presentation and in-depth analysis of results. Clearly demonstrates an ability to critically evaluate and discuss research findings in the context of relevant literature. Obvious demonstration of insight and novelty/originality. An excellently executed report with very minor shortcomings in some aspects.</td>
</tr>
<tr>
<td><strong>70-79</strong></td>
<td>A very good project report showing evidence of wide reading, with clear presentation and thorough analysis of results and an ability to critically evaluate and discuss research findings in the context of relevant literature. Clear indication of some insight and novelty/originality. A very competent and well-presented report overall but falling short of excellence in some aspects. Sufficient quality/breadth of work similar to requirements for an abstract at a scientific conference.</td>
</tr>
<tr>
<td><strong>60-69</strong></td>
<td>A good project report which shows a reasonably good understanding of the problem and some knowledge of the relevant literature. Mostly sound presentation and analysis of results but with occasional lapses. Some relevant interpretation and critical evaluation of results, though somewhat limited in scope. General standard of presentation and organisation adequate to good.</td>
</tr>
<tr>
<td><strong>50-59</strong></td>
<td>A moderately good project report which shows some understanding of the problem but limited knowledge and appreciation of the relevant literature. Presentation, analysis and interpretation of the results at a basic level and showing little or no novelty/originality or critical evaluation. Insufficient attention to organisation/presentation of report.</td>
</tr>
<tr>
<td><strong>40-49</strong></td>
<td>A weak project report showing only limited understanding of the problem and superficial knowledge of the relevant literature. Results presented in a confused or inappropriate manner and incomplete or erroneous analysis. Discussion and interpretation of result severely limited, including some basic misapprehensions, and lacking any novelty/originality or critical evaluation. General standard of presentation poor.</td>
</tr>
<tr>
<td><strong>20-39</strong></td>
<td>An unsatisfactory project containing substantial errors and omissions. Very limited understanding, or in some cases misunderstanding of the problem and very restricted and superficial appreciation of the relevant literature. Very poor, confused and, in some cases, incomplete presentation of the results and limited analysis of the results including some serious errors. Severely limited discussion and interpretation of the results revealing little or no ability to relate experimental results to the existing literature. Very poor overall standard of presentation.</td>
</tr>
<tr>
<td><strong>0-19</strong></td>
<td>A very poor project report containing many errors, with almost no understanding of the problem and the literature pertaining to it. Chaotic presentation of results, and in some cases non-existent or inappropriate or plainly wrong analysis. Discussion and interpretation seriously confused or wholly erroneous revealing basic misapprehensions.</td>
</tr>
</tbody>
</table>
14.4 Emergency procedure
In the event of an emergency, **dial Security Services on extension 1999.**
Security Services provide a 24-hour service to the college community, 365 days a year. They are the liaison to the Fire, Garda and Ambulance services and all staff and students are advised to always telephone extension 1999 (+353 1 896 1999) in case of an emergency.

Should you require any emergency or rescue services on campus, you must contact Security Services. This includes chemical spills, personal injury or first aid assistance.

It is recommended that all students save at least one emergency contact in their phone under ICE (in Case of Emergency).
Appendix 1. Project Risk Assessment Form

Department of Mechanical & Manufacturing Engineering
Trinity College Dublin
Project Risk Assessment Form

<table>
<thead>
<tr>
<th>Student Name</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Student Number</td>
<td></td>
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<tr>
<td>Student Category</td>
<td></td>
</tr>
<tr>
<td>(BAI, BSC, MAI, MSc, PhD or Visitor)</td>
<td></td>
</tr>
<tr>
<td>Year of Course</td>
<td></td>
</tr>
<tr>
<td>Project Title and Reference</td>
<td></td>
</tr>
<tr>
<td>Start Date of Project</td>
<td></td>
</tr>
<tr>
<td>Building Location of Project Work</td>
<td></td>
</tr>
<tr>
<td>Room number</td>
<td></td>
</tr>
<tr>
<td>Supervisors name</td>
<td></td>
</tr>
</tbody>
</table>

**Project Details**

Give a brief description of the work to be undertaken and the procedures used. Please include details of the equipment, machinery, chemicals and substances necessary for the project.
## Project Risk Assessment Form

### Project Risk Assessment

Identify the hazards which may be associated with the work and state what control measures are to be put in place to control the risk. Some examples of potential Hazards are included below. Please use this as a starting point and delete as necessary. If no hazards are anticipated write “none” in the boxes below.

<table>
<thead>
<tr>
<th>Potential Hazard</th>
<th>Control Measures Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure to Chemicals</td>
<td></td>
</tr>
<tr>
<td>Exposure to Hot liquids</td>
<td></td>
</tr>
<tr>
<td>Laboratory Gases</td>
<td></td>
</tr>
<tr>
<td>Noise</td>
<td></td>
</tr>
<tr>
<td>Lone working</td>
<td></td>
</tr>
<tr>
<td>Exposure to ultraviolet (UV) radiation</td>
<td></td>
</tr>
<tr>
<td>Equipment and tools</td>
<td></td>
</tr>
</tbody>
</table>

Students are permitted entry into the Department out of normal office hours, up to 10pm on weekdays, and between 10am and 4pm on weekends. As per the College laboratory health and safety policy, Lone working for non-hazardous operations may be permitted, once a risk assessment has been conducted and approved by the Principal Investigator, Local Safety Officer and Head of School. Lone working is not permitted for Undergraduate students.

Student Sign and Date

Supervisor Sign and Date

**THIS FORM SHOULD BE SUBMITTED TO THE DEPARTMENTAL SAFETY OFFICER, THE PROJECT SUPERVISOR AND THE STUDENT SHOULD KEEP A COPY**