## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of Contents</td>
<td>1</td>
</tr>
<tr>
<td>Welcome from Program Director</td>
<td>2</td>
</tr>
<tr>
<td>Mission Statement</td>
<td>3</td>
</tr>
<tr>
<td>Course Structure, JS Modules and Timetables and Key Dates</td>
<td>4</td>
</tr>
<tr>
<td>Annual Schedule &amp; Dates of Examinations</td>
<td>9</td>
</tr>
<tr>
<td>Training and Career Development</td>
<td>10</td>
</tr>
<tr>
<td>College Regulations</td>
<td>15</td>
</tr>
<tr>
<td>College Information</td>
<td>18</td>
</tr>
</tbody>
</table>
Overview

Welcome to the Junior Sophister Year in Biomedical Engineering

As students of the Biomedical Engineering stream of School of Engineering, you are among the select few who have joined the biomedical engineering community at Trinity College Dublin for an education that will enable you to become the next leaders in the field of biomedical engineering.

Some of the most exciting work in engineering today takes place at the intersection of disciplines. Research in biomedical engineering is an example of where the biological, physical and digital worlds intersect and where you have the opportunity to have a profound impact on society.

Engineering is not just about crunching numbers or solving problems; it is seeing how problems affect society and how society actually changes because of the solutions you provide. You have an opportunity here as students in biomedical engineering to come involved in that community, so that, as you move into your professional life, you will become a leader who has an impact on the human condition. To see this impact, I recommend you watch the following video:

http://students.embs.org/

You are part of a discipline that offers great opportunities for learning and advancement within Ireland’s premier university. You are now part of the Trinity Centre for Bioengineering. The Centre brings together over 25 academics from the Schools of Engineering, Natural Sciences, Dental Sciences and Medicine in Trinity and colleagues from the Royal College of Surgeons in Ireland, Dublin City University and University College Dublin. There are also over 100 postdoctoral, PhD and MSc researchers working in the Centre. All of these researchers are involved in exciting new developments in biomedical engineering ranging from developing new materials for use in cardiac care, analysing minute electrical signal changes in the brain for neurological diagnosis to artificially growing new tissue for organ transplantation. The Trinity Centre for Bioengineering has extensive clinical research in all the five teaching hospitals in Dublin (St James’s Hospital, Tallaght Hospital, St Vincent’s University Hospital, The Mater Misericordiae Hospital and Beaumont Hospital). As a member of this biomedical community, use the opportunity to learn from activities in the Trinity Centre for Bioengineering, so that you can relate your course material to the real clinical challenges that are being researched and the solutions being generated.

The Trinity Centre for Bioengineering is based in the Trinity Biomedical Sciences Centre and many of its laboratories are located here. You will be sent emails of seminars, news and other developments. Keep up to date with these and your studies will become more fruitful and relevant.

This handbook contains information regarding the course including modules, assessment, course regulations, faculty members and important contact details.

On behalf of all the lecturers and staff, I would like to wish you every success. We look forward to you becoming part of the Trinity College Biomedical Engineering family as you embark on making your mark on society at large.

If you have any questions or comments, please do not hesitate to contact us.

Professor Daniel Kelly

Course Director MAI Program in Bioengineering
Biomedical Engineering – Mission Statement

The Trinity Centre for Bioengineering (TCBE) in the School of Engineering at Trinity College Dublin carries out world class research in four research themes: (1) Tissue Engineering & Regenerative Medicine, (2) Medical Devices & Advanced Drug Delivery, (3) Biomechanics & Mechanobiology and (4) Neural Engineering. These themes are based on the intersection of biomedical science and engineering and form the foundation for advances in external and implantable devices, surgical and medical device design, as well as informing clinical studies and interventions in ageing, neurodegeneration and rehabilitation. The Centre provides a structure to bring bioengineers, basic scientists and clinicians together to focus on important clinical needs.

The TCBE also has a long and distinguished tradition in postgraduate education, combining fundamental research with translation to clinical practice. The new Biomedical Engineering stream now extends this to the undergraduate BA/MAI programme within the School of Engineering. The main objective of this new stream is the pursuit of excellence in teaching and research in Biomedical Engineering with the central aim of producing graduate engineers with a capacity for independent thought in problem solving and creative analysis & design.

To achieve this, we must:

- instill in students an enthusiasm for the art and practice of Biomedical Engineering;
- teach engineering, medical sciences and mathematics which underpin the subject areas of Biomedical Engineering;
- demonstrate the application of these principles to the analysis, synthesis and design of biomedical engineering components and systems;
- foster the development of team working skills;
- encourage students to exercise critical judgment and develop communication skills necessary to make written and oral presentations of their work.

These objectives are underpinned by:

- undertaking both basic and applied research
- 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 peer-reviewed scientific journals.

In addition, we must consider:

- the requirements of the relevant professional institutions
- the needs of Irish and European industry in the curriculum.
JS Modules and Timetables

The Junior Sophister year is based on the general Freshman years and is the start of your specialization in Biomedical Engineering. In your studies you should aim to work a minimum of 50 hours per week. With a timetabled schedule of about 25 hours per week, this means you should be planning independent study of at least 25 hours per week. *This includes reading course material prior to lectures - you should not expect to be given all the module material in the lectures and tutorials.* The table below shows the JS modules, their credit value and the coordinator.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Code</th>
<th>Module Title</th>
<th>ECTS</th>
<th>Term</th>
<th>Module Coordinator</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA3E1</td>
<td>3E1</td>
<td>Engineering Mathematics V</td>
<td>5</td>
<td>S1</td>
<td>Prof. Brendan Browne (<a href="mailto:browne@maths.tcd.ie">browne@maths.tcd.ie</a>)</td>
</tr>
<tr>
<td>ME3B2</td>
<td>3B2</td>
<td>Fluid Mechanics</td>
<td>5</td>
<td>S1</td>
<td>Prof. Craig Meskell (<a href="mailto:cmeskell@tcd.ie">cmeskell@tcd.ie</a>)</td>
</tr>
<tr>
<td>ME3B4</td>
<td>3B4</td>
<td>Mechanical Engineering Materials</td>
<td>5</td>
<td>S1</td>
<td>Prof. Mark Ahearne (<a href="mailto:ahearnem@tcd.ie">ahearnem@tcd.ie</a>)</td>
</tr>
<tr>
<td>ME3B5</td>
<td>3B5</td>
<td>Mechanics of Machines</td>
<td>5</td>
<td>S1</td>
<td>Dr. Ciaran Simms (<a href="mailto:csimms@tcd.ie">csimms@tcd.ie</a>)</td>
</tr>
<tr>
<td>EE3C01</td>
<td>3C1</td>
<td>Signals &amp; Systems</td>
<td>5</td>
<td>S1</td>
<td>Dr. David Corrigan (<a href="mailto:dacorrig@tcd.ie">dacorrig@tcd.ie</a>)</td>
</tr>
<tr>
<td>EE3BIO1</td>
<td>3BIO1</td>
<td>Anatomy &amp; Physiology</td>
<td>5</td>
<td>S1</td>
<td>Dr. Deirdre Edge (<a href="mailto:edged@tcd.ie">edged@tcd.ie</a>)</td>
</tr>
<tr>
<td>ME3BIO3</td>
<td>3BIO3</td>
<td>Quantitative Physiology</td>
<td>5</td>
<td>S1</td>
<td>Prof. Richard Reilly (<a href="mailto:reillyri@tcd.ie">reillyri@tcd.ie</a>)</td>
</tr>
<tr>
<td>EE3E3</td>
<td>3E3</td>
<td>Probability &amp; Statistics</td>
<td>5</td>
<td>S1</td>
<td>Prof. Anthony Quinn (anthony.quinn.tcd.ie)</td>
</tr>
<tr>
<td>CE3E4</td>
<td>3E4</td>
<td>Innovation &amp; Entrepreneurship for Engineers</td>
<td>5</td>
<td>S2</td>
<td>Prof. Niamh Harty (<a href="mailto:niamh.harty@tcd.ie">niamh.harty@tcd.ie</a>)</td>
</tr>
<tr>
<td>ME3B3</td>
<td>3B3</td>
<td>Mechanics of Solids</td>
<td>5</td>
<td>S2</td>
<td>Prof. Tim Persoons (<a href="mailto:tim.persoons@tcd.ie">tim.persoons@tcd.ie</a>)</td>
</tr>
<tr>
<td>EE3C03</td>
<td>3C3</td>
<td>Analogue Circuits</td>
<td>5</td>
<td>S2</td>
<td>TBC</td>
</tr>
<tr>
<td>ME3BIO2</td>
<td>3BIO2</td>
<td>Biomedical Device Design Project</td>
<td>5</td>
<td>S2</td>
<td>Prof. Caitriona Lally (<a href="mailto:lallyca@tcd.ie">lallyca@tcd.ie</a>)</td>
</tr>
</tbody>
</table>
Junior Sophister Module Sheets

https://www.tcd.ie/Engineering/undergraduate/baiyear3/biomed/
Prerequisites

The MAI programme is structured to facilitate delivery of higher-level content through prerequisite modules. The term ‘prerequisite’ indicates a module that must be completed prior to engaging a new one. Only in exceptional circumstances will a student be permitted to progress without having completed a prerequisite module. Some of the fourth year modules are prerequisites for some of the fifth-year modules and some MAI projects in the different disciplines. In general, it will not be possible to take fifth-year modules or MAI projects without having completed the required prerequisites for these activities (see module descriptors for details). Accordingly, for students opting for a placement in their fourth year, or for those following Unitech/Erasmus or another period of study abroad, it will be necessary to ensure prerequisites are met for a suitable set of modules and the project work in the fifth-year.

Meeting the prerequisites in cases where a student opts for a placement in their fourth year or for those following Unitech/Erasmus or another period of study abroad might be achieved by:

1. in the case of a half-year placement, the student taking the prerequisite modules for their intended fifth-year modules/project work in the semester they spend at College (this will generally be the first semester). Prerequisite modules will, where possible, be timetabled for the first semester.

2. in the case of a period of study abroad, the student taking modules equivalent to the prerequisites for their intended fifth-year modules/project work during their period of study abroad in their fourth year

3. by the student taking only fifth-year modules/projects which do not have prerequisites

4. by student taking fourth year prerequisite modules in the first semester of their fifth-year. However, for the latter option, since this would be on a case-by-case basis, the timetable cannot be specifically arranged to facilitate this.

Thus, a student who opts for a placement or for a period of study abroad must understand that this will influence their options in the fifth-year. Accordingly, a student intending to pursue this option must do so in consultation with their Head of Department or his/her delegate. In special circumstances, where a student can demonstrate to the module coordinator that he/she has substantially met the learning outcomes of a prerequisite module through other means, students may be allowed to take the fifth-year module without having completed the designated fourth year prerequisite(s).
Lecture and Tutorial Timetable

Attendance at lectures is compulsory. Attendance at laboratories and tutorials is compulsory.

The timetable for lectures is provided below. The tutorial Schedules will be announced at the start of each semester. Please note that you must attend the particular tutorial 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.

The most up to date timetable is always online at:

https://www.tcd.ie/Engineering/undergraduate/pdf/JSTimetable_BIO.PDF

You are advised to check the online timetable regularly.
Laboratories

Each module in JS has one or two laboratory experiments attached to it. Students are expected to keep a log book 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 results in a zero mark even if a report is submitted.

No report submitted means a zero mark even if the lab was attended.

Labs cannot be taken summer/autumn if missed during the year and marks for the annual examinations will be carried forward to any supplementals.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Module</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Pelton Wheel</td>
<td>3B2</td>
<td>Prof. Meskell</td>
</tr>
<tr>
<td>5</td>
<td>Vibration Test</td>
<td>3B5</td>
<td>Dr. Simms</td>
</tr>
<tr>
<td>7</td>
<td>Lead Creep</td>
<td>3B4</td>
<td>Prof. Ahearne</td>
</tr>
<tr>
<td>8</td>
<td>Strain Gauges</td>
<td>3B3</td>
<td>Dr. Murphy</td>
</tr>
<tr>
<td>A1</td>
<td>Active Filters</td>
<td>3C3</td>
<td>TBC</td>
</tr>
<tr>
<td>A2</td>
<td>Electronic Oscillators</td>
<td>3C3</td>
<td>TBC</td>
</tr>
<tr>
<td>Cal. Wk</td>
<td>Dates 2016/17 (week beginning)</td>
<td>Outline Structure of Academic Year 2016/17</td>
<td>Notes</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------</td>
<td>------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>1</td>
<td>29-Aug-16</td>
<td>Supplemental Examinations</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>05-Sep-16</td>
<td>Freshers’ Week / Undergraduate Orientation Week</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>12-Sep-16</td>
<td>Teaching Week 1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>19-Sep-16</td>
<td>Teaching Week 2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>26-Sep-16</td>
<td>Teaching Week 3</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>03-Oct-16</td>
<td>Teaching Week 4</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>10-Oct-16</td>
<td>Teaching Week 5</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>17-Oct-16</td>
<td>Teaching Week 6 (Monday, Public Holiday)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>24-Oct-16</td>
<td>Teaching Week 7 - Study Week</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>07-Nov-16</td>
<td>Teaching Week 8</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>14-Nov-16</td>
<td>Teaching Week 9</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>21-Nov-16</td>
<td>Teaching Week 10</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>28-Nov-16</td>
<td>Teaching Week 11</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>05-Dec-16</td>
<td>Teaching Week 12</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>12-Dec-16</td>
<td>Christmas Period (College closed)</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>19-Dec-16</td>
<td>23 December 2016 to 2 January 2017, inclusive</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>09-Jan-17</td>
<td>Foundation Scholarship Examinations</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>16-Jan-17</td>
<td>Teaching Week 1</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>23-Jan-17</td>
<td>Teaching Week 2</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>30-Jan-17</td>
<td>Teaching Week 3</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>06-Feb-17</td>
<td>Teaching Week 4</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>13-Feb-17</td>
<td>Teaching Week 5</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>20-Feb-17</td>
<td>Teaching Week 6</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>27-Feb-17</td>
<td>Teaching Week 7 - Study Week</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>06-Mar-17</td>
<td>Teaching Week 8</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>13-Mar-17</td>
<td>Teaching Week 9 (Friday, Public Holiday)</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>20-Mar-17</td>
<td>Teaching Week 10</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>27-Mar-17</td>
<td>Teaching Week 11</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>03-Apr-17</td>
<td>Teaching Week 12</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>10-Apr-17</td>
<td>Revision Trinity Week (Monday, Trinity Monday; Friday, Good Friday)</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>17-Apr-17</td>
<td>Revision (Monday, Easter Monday)</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>24-Apr-17</td>
<td>Revision</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>01-May-17</td>
<td>Annual Examinations 1 (Monday, Public Holiday)</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>08-May-17</td>
<td>Annual Examinations 2</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>15-May-17</td>
<td>Annual Examinations 3</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>22-May-17</td>
<td>Annual Examinations 4</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>29-May-17</td>
<td>Marking/Courts of Examiners/Results</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>05-Jun-17</td>
<td>Marking/Courts of Examiners/Results (Monday, Public Holiday)</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>12-Jun-17</td>
<td>Marking/Courts of Examiners/Results</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>19-Jun-17</td>
<td>Courts of First Appeal/Academic Appeals</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>26-Jun-17</td>
<td>Postgraduate dissertations/theses/Research 1-8</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Statutory Term (Michaelmas) begins on 29-Aug-16.
- Michaelmas Lecture term begins on 05-Sep-16.
- Hilary Term begins on 16-Jan-17.
- Trinity Term begins on 10-Apr-17.
- Annual Examination period: Four weeks followed by five weeks for marking, examiners’ meetings, publication of results, Courts of First Appeal and Academic Appeals.
- Statutory (Trinity) Term ends Sunday 02 July 2017.
Training and Career Development

(Details for 2017 to be confirmed)

Health Research Board Summer Scholarships 2016

The Health Research Board will invite applications for the purpose of the student scholarships is to encourage an interest in research and to give the student an opportunity to become familiar with research techniques.

Who can apply?

Undergraduate students who are studying in a relevant discipline at a university/third level institute in Ireland but not in the final year of their degree course and who have not previously received a Summer Student Scholarship from the HRB.

In line with the HRB strategy the project must fall within one of the following research areas: patient oriented research, health services research, or population health research.

Applications that focus solely or predominantly on basic biomedical research are not eligible.

What is the value of the award?

The amount typically paid is €250 per week for a maximum of eight weeks.

What is the application process?

All applications for the HRB Summer Scholarship Scheme 2016 will be via the HRB’s online Grants E-Management System (GEMS). The College Research Office endorses all applications on behalf of the Dean of Research and then makes the submissions (via GEMS) to the HRB on the applicant’s behalf. Prior to submission to the College Research Office, the Heads of School of Engineering and Medicine must endorse your application. The College Research Office has requested advance notice of your interest in applying for this scheme, please e-mail research.office@tcd.ie. The call is not expected to open until December 2015.

For more information:


Summer Internships

Internships in research labs in the Trinity Centre of Bioengineering are available at the end of the SS year. Ms Melissa Caffrey coordinates information on the availability of vacation internships. She can be contacted for further information by email at bioeng@tcd.ie.

Vacation Work

Vacation work in a number of biomedical companies is available at the end of the SS year. Dr. Bruce Murphy is the industry liaison and Ms Melissa Caffrey coordinates information on the availability of vacation employment.
International and National Biomedical Engineering Societies

IEEE Engineering in Medicine & Biology Society (IEEE EMBS: www.embs.org)

The IEEE Engineering in Medicine and Biology Society (EMBS) is the world's largest international society of biomedical engineers. The organization's 9,100 members reside in some 97 countries around the world. EMBS provides its members with access to the people, practices, information, ideas and opinions that are shaping one of the fastest growing fields in science. The IEEE EMBS has six publications which are available online through the Library to Trinity College students:

- Transactions on Biomedical Engineering
- IEEE PULSE
- Transactions on Neural Systems and Rehabilitation Engineering
- Transactions on Information Technology in Biomedicine
- Reviews in Biomedical Engineering
- IEEE Journal of Translational Engineering in Health and Medicine (J-TEHM)

The student subscription to the IEEE EMBS is $27 per year.

The IEEE has developed the Life Sciences Portal (http://lifesciences.ieee.org/), which has become one of the premiere global resources and online communities for knowledge, opportunity, and collaboration, enabling cross-disciplinary solutions in life sciences. Sign up to this site to keep up to date with new developments and career opportunities.

Biomedical Engineering Society (BMES: bmes.org)

The Biomedical Engineering Society (BMES) aims to serve as the world's leading society of professionals devoted to developing and using engineering and technology to advance human health and well-being. The Mission of the BMES is to build and support the biomedical engineering community, locally, nationally and internationally, with activities designed to communicate recent advances, discoveries, and inventions; promote education and professional development; and integrate the perspectives of the academic, medical, governmental, and business sectors.
The Biomedical Engineering Society produces several publications to keep its members informed of activities in the Society and developments in the biomedical engineering profession. These journals are available to Trinity College students through online access via the Library.

- Annals of Biomedical Engineering,
- Cellular and Molecular Bioengineering
- Cardiovascular Engineering and Technology

The student subscription to the BMES is $30 per year.

**European Society for Engineering and Medicine (ESEM: www.esem.org)**

The mission of ESEM is to establish a platform of cooperation between medicine and engineering on a European basis. Such a bridge between medicine and engineering is vital in today's highly technological multi-disciplinary health care. Without this, medical doctors cannot keep up with rapidly developing health care technology and cannot provide their patients with state-of-the-art medical diagnosis and treatment. Equally, without close contact with medical doctors, engineers cannot focus their efforts upon the most pressing medical problems.

ESEM's mission brings benefits to medicine, to engineering and hence to the community, by supporting and identifying to medical doctors current and developing engineering contributions and technical developments in medicine; and by identifying for engineers specific medical problems which need to be solved by appropriate technological means.

The basic objectives of ESEM are the following:

- To promote cultural and scientific exchanges at a European level between engineers (of all disciplines), related industries, and the medical profession.
- To encourage the creation of European research and clinical networks.
- To reinforce (by wider dissemination of information) European potentialities in engineering and medicine.
- To contribute to the promotion of European Union programmes in the fields of Engineering and Medicine.
- To participate in specific education and training courses for European engineers and European medical and health care workers.
- To cooperate closely with other relevant international and national organisations concerned with engineering and/or medicine

The student subscription to ESEM is €20 per year.

**Engineers Ireland**

([www.engineersireland.ie/Groups/Dviisions/Biomedical.aspx](http://www.engineersireland.ie/Groups/Dviisions/Biomedical.aspx))

With almost 24,000 members from every discipline of engineering, Engineers Ireland is the voice of the engineering profession in Ireland. 1600 engineers are estimated to be working in the biomedical industry in Ireland. This industry accounts for approximately 8% of Ireland’s GNP.

12
The mission of Engineers Ireland is to provide a professional and social network for learning and developing potential businesses in the thriving field.

The student membership to Engineers Ireland is free.

**Information on Electronic Engineering Labs**

**Introduction:**

The programme of Electronic Engineering Laboratories is intended to complement and enhance the material covered in lectures for the wide range of subjects in the Junior Sophister year. Marks awarded for these laboratories will contribute to the overall mark for the particular subject at Annual and Supplemental Examinations. Each laboratory will require a properly structured report to be written up and submitted by each individual student, which will then be marked by the laboratory demonstrator and returned to the student.

**Attendance:**

Attendance at the laboratories is compulsory and will be monitored throughout the year. Any report submitted by a student who has not attended the corresponding laboratory will not be marked. If a laboratory is missed due to illness or participation in an official College activity this should be certified and arrangements will be made where possible for the laboratory to be undertaken at a later stage. Casual or unexplained absences will not be facilitated. Please also note that laboratories not completed during the teaching semesters cannot be repeated during the summer vacation for supplemental examinations and existing marks will be carried forward to the supplemental results.

**Reports:**

You are required to write up a properly structured report on each laboratory undertaken. You may also be requested by the demonstrator to save or print out some electronic files from computer simulations as part of the submission. The report may be typed or handwritten. If it is handwritten it must be clearly legible to the demonstrator. The structure of the report should include:

- **Name:** The student’s name and ID number.
- **Title:** The code and name of the laboratory.
- **Date:** Date on which laboratory was undertaken.
- **Aims:** The specific intentions and objectives of the laboratory
- **Experimental Set-up:** Details of the equipment used and the experimental set-up. If the laboratory is a simulation type the name and function of the software packages used should be given.
- **Procedure:** An account of the steps involved in carrying out the experiment. A summarised version of the more detailed instructions given in the laboratory handout will suffice.
- **Results:** A clear and accurate record of the results obtained. This should include tables of experimental data, numerical parameters, printouts of simulation waveforms or other appropriate forms of results. It should be possible from the results for a reader to get a complete understanding of the outcome of the laboratory.
**Discussion:** A detailed analysis and criticism of the results obtained. You should discuss the accuracy of the results, any limitations and their significance. You should relate them to the material covered in the lectures where possible. You should indicate what you have learned from the laboratory that is important in your discipline.

**Conclusion:** You should consider the importance and implications of the experiment you have carried out in the wider context of Electronic Engineering. You should give your opinions on what is good or bad practice concerning the topic covered by the laboratory and any professional ethical issues you feel are important.

**Submission:** The deadline for handing up your report is 1 week after completion of the lab unless otherwise stated by the relevant lecturer. Reports are submitted by placing them in the marked box in the PC Lab on the first floor of the printing house. The box will be emptied once a week and you will receive an email acknowledgement of your submission.

**Note:** Please keep a copy of your report for your records
COLLEGE RULES AND REGULATIONS

Description of the European Credit Transfer and Accumulation System (ECTS)

The 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 input 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 assigned to a module and its level of difficulty. The European norm for full-time study over one academic year is 60 credits.

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

Examinations and Assessment

Individual module results are based on a combination of written examination and/or continuous assessment as described in the individual module descriptors included in this handbook. Note that some modules do not have a written examination and are therefore not available for assessment during the Supplemental Exam period.

The overall result for the year is the weighted average of the individual module results. The weighting is based on the ECTS credits associated with each module.

Students are obliged to be present and make a serious attempt at all their examinations. Examination timetables are published on College and School websites some weeks before the examinations take place. It is your responsibility to note these carefully – you will be informed that timetables have been published but you must check them continuously, as examination details may change. All marks for labs/assignments are provisional until after the court of examiners meet.

The rules for progressing from the JS year are laid out in the Calendar (Section M).

For those leaving College after the Senior Sophister year, 20% of the total mark achieved at the first sitting of examinations in Junior Sophister year will count towards the final degree classification.

Progression to MAI

The accrediting body for engineering, Engineers Ireland, has stipulated that the educational requirement for Chartered Engineering is a master’s degree. In Trinity this is the MAI which is
awarded after 5 years. Progression requirements to the 5th year are described in the Calendar (Section M). In summary it is limited to those students who have been awarded either:

1. a second class (first division) grade or better in their 4th year

or

2. a second class (second division) grade or better in both their 3rd and 4th years.

In both cases, the grade is determined at the first sitting of examinations. NOTE: Students who elect to pursue the MAI degree will not do 4E2 (Project) in 4th year. Should a student not satisfy either of the criteria for progression to the 5th year, he/she may be awarded a BAI. In these the cases the student will graduate without completing 4E2.

**Attendance, Non-Satisfactory Attendance, Module Work**

Please note the following extract from the University Calendar: “For professional reasons, lecture and tutorial attendance in all years is compulsory in the School of Engineering.” Attendance at practical classes is also compulsory.

All students must fulfil the requirements of the School with regard to attendance and module work. Students whose attendance or work is unsatisfactory in any year may be refused permission to take all or part of the annual examinations for that year. Where specific attendance requirements are not stated, students are non-satisfactory if they miss more than a third of a required module in any term.

At the end of the teaching term, students who have not satisfied the department or school requirements may be returned to the Senior Lecturer’s Office as non-satisfactory for that term. In accordance with the regulations laid down by the University Council, non-satisfactory students may be refused permission to take their annual examinations and may be required by the Senior Lecturer to repeat their year. See also the sections dealing with College and engineering examination regulations.

College regulations are set out in the University Calendar, which may be consulted in any College Library, the Enquiries Office, any academic or administrative office or online – www.tcd.ie/calendar/. You are expected to be aware of the various regulations - ignorance of the regulations is not a valid reason for failure to comply.

**Collaboration and Individual Work**

Engineering is about co-operation, but also individual effort. The everyday fruits of engineering, such as jet aircraft, suspension bridges, microprocessors or software systems, have been designed and built by teams of hundreds, even thousands, of engineers working together. These engineers exchange ideas and ultimately co-ordinate their efforts to achieve the overall project goal. However, each component of even the largest project is the result of one individual’s engineering skill and imagination. If you want to become a successful engineer, you must develop your own ability to analyse problems. This means that, while it is useful to work as a team initially, you must ultimately produce your own work. For example, for a computing exercise, discuss the task with your classmates, swap ideas on how to solve the problem, but at the end of the day, implement your own solution. The examinations will test your ability rather than just your knowledge and the only way to develop your ability for engineering analysis is to complete the laboratory and tutorial exercises yourself.
**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](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](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](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.
**COLLEGE INFORMATION**

**Student Disability Services**

Do you know what supports are available to you in College if you have a disability or a specific learning disability? If you have a disability or a specific learning disability (such as dyslexia) you may want to register with Student Disability Services. Further information on our services can be found at [www.tcd.ie/disability](http://www.tcd.ie/disability).

**Declan Reilly and Alison Doyle** are the Disability Officers in College. You can make an appointment to see them by phoning 6083111, or emailing them at: [disab@tcd.ie](mailto:disab@tcd.ie).

**Skills4Study Campus (S4SC)**

Skills4studycampus (S4SC) is a fully interactive e-learning resource, which helps students to develop study skills and is suitable for students on all modules and in any year of study.

Published by Palgrave Macmillan, core skills are developed through personalized interactive activities, tests and assessments. Utilised by HEIs in UK and in ROI includes UCC and UCD.

In 2011 – 2012 piloted to all JF students in School of Nursing and Midwifery, Social Work and Social Policy, Drama and Theatre Studies, TAP, Mature and disability students.

Feedback from staff has been very encouraging. Fully embedded by School of Nursing (module handbook, skills module) and end of year analysis of academic performance indicates positive correlation with S4SC usage / module completion.

Study skills can be provided ‘anytime, anywhere’, fully accessible to students living outside of Dublin, or who commute long distances, have family or work commitments, extensive off campus placements, or heavy timetables.

Due to the large number of students it is not possible to provide this via the Blackboard Learn, the College Disability Service will fund access to S4SC for all TCD undergraduate students and academic staff for AY 2012 – 2013. Login will continue to be provided via the link on [www.tcd.ie/local](http://www.tcd.ie/local), additional links should be added on Student Homepage, Orientation website and the new student portal my.tcd.ie.

A key factor is engagement and support from academic staff and embedding of resource within module materials. The College Disability Service proposes to present S4SC to all Directors of Undergraduate Teaching and Learning at the beginning of the next academic year.

The first module ‘Getting ready for academic study’ is a free open resource. It is suggested that a link is added to the registration email issued to all prospective students via GeneSIS. This will identify this resource at the point of pre-entry so that students have already been familiarised with its structure and content.

**Student 2 Student**

S2S offers trained Peer Supporters if you want to talk confidentially to another student or just to meet a friendly face for a coffee and a chat. Peer Supporters are there to assist with everything from giving you the space to talk about things to helping you access resources and services in the College. You can email us directly to request a meet-up with a Peer Supporter or can pop in to the Parlour to talk directly to one of our volunteers and arrange a meeting.

S2S is supported by the Senior Tutor’s Office and the Student Counselling Service.
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 Departments of Mechanical and Manufacturing Engineering and in the Department of Electronic and Electrical Engineering:

http://www.mme.tcd.ie/ (bottom left tab)

Please ensure you comply with the instructions given in these important documents. Failure to behave in a safe manner may result in your being refused the use of departmental facilities.

Staff/Student Committee

The Staff/Student Committee meets once a semester to discuss matters of interest and concern to students and staff. It comprises class representatives from each year.

Facilities

All modules in the Sophister years are supplemented by a full programme of laboratory work. The Junior Sophister laboratory timetable is co-ordinated by Dr. Gareth Bennett in the Department of Mechanical and Manufacturing Engineering and Dr. David Corrigan in the Department of Electronic and Electrical Engineering. The laboratories are well equipped for undergraduate work and, in addition, we have extensive research facilities, which are available for projects. The Department of Mechanical and Manufacturing Engineering has its own well-equipped workshops which are managed by Mr. Mick Reilly. The Computer Applications Laboratories are administered by Mr. John Gaynor and we have state of the art work stations which are used extensively in both the Design Module in third year and for the Project work in fourth and fifth years as appropriate. Students are encouraged to make use of these facilities.

The department of electronic and electrical engineering has an undergraduate experimental laboratory on the ground floor of the printing house with bench facilities and equipment for approximately 50 students. It also houses a computer laboratory with provision of state of the art PC’s for 30 students. There is also a project laboratory shared by Senior Sophister students. Teaching facilities in Áras an Phiarais include a 20 seat laboratory containing music technology application hardware and software, a smaller teaching laboratory as well as a small recording studio and an audio/video editing facility. The Microelectronics Technology Laboratory located in the Sami Nasr building has a class 1,000 area which contains a wet bench and two furnaces where undergraduate students can carry out experiments in the integrated circuit fabrication process under close supervision. A mask aligner, Micromanipulator test probe set-up and various microscopes are also available.
Contacts:

Course administration: Melissa Caffrey
Trinity Centre for Bioengineering
Trinity Biomedical Sciences Institute,
Trinity College Dublin,
152-160 Pearse Street,
Dublin 2
Tel: +353-1-8964378
Email: bioeng@tcd.ie
Web: http://www.tcd.ie/engineering/

Course coordinator: Prof Daniel Kelly

Academic contact: Prof Triona Lally

Global Officer: Deirbhle O’Reilly
Email: InternationalEng@tcd.ie