DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING
Faculty of Engineering
Fluid Mechanics MSc Cluster

STUDENT HANDBOOK
2017-18
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Welcome to the College

Congratulations on joining Imperial College London, the only university in the UK to focus exclusively on science, medicine, engineering and business.

From Fleming’s discovery of Penicillin to Gabor’s invention of holography, Imperial has been changing the world for well over 100 years. You’re now part of this prestigious community of discovery and we hope you will take this opportunity to make your own unique contribution.

We’re committed to providing you with the very best academic resources to enrich your experience. We also provide a dedicated support network and a range of specialist support services to make sure you have access to the appropriate help, whether that’s further training in an academic skill like note taking or simply having someone to talk to.

You’ll have access to an innovative range of professional development courses within our Graduate School throughout your time here, as well as opportunities to meet students from across the College at academic and social events – see page 6 for more information.

We actively encourage you to seek out help when you need it and try to maintain a healthy work-life balance. Our choice of over 375 clubs, societies and projects is one of the largest of any UK university, making it easy to do something different with your downtime. You also have free access to gym (following a one-off orientation fee of £40 in 2017-18) and swimming facilities across our campuses.

As one of the best universities in the world, we are committed to inspiring the next generation of scientists, engineers, clinicians and business leaders by continuing to share the wonder of what we do through public engagement events. Postgraduate students, alongside our academics and undergraduate students, make a significant contribution to events such as our annual Imperial Festival and our term-time Imperial Fringe events – if you’re interested in getting involved then there will be opportunities for you to do so.
Our Principles

In 2012 the College and Imperial College Union agreed ‘Our Principles’ a series of commitments made between students and the College. The Principles are reviewed annually by the Quality Assurance and Enhancement Committee and changes recommended for Senate approval.

Imperial will provide through its staff:

• A world class education embedded in a research environment
• Advice, guidance and support
• The opportunity for students to contribute to the evaluation and development of programmes and services

Imperial will provide students with:

• Clear programme information and assessment criteria
• Clear and fair academic regulations, policies and procedures
• Details of full programme costs and financial support
• An appropriate and inclusive framework for study, learning and research

Imperial students should:

• Take responsibility for managing their own learning
• Engage with the College to review and enhance provision
• Respect, and contribute to, the Imperial community

The Imperial College Students’ Union will:

• Support all students through the provision of independent academic and welfare assistance
• Encourage student participation in all aspects of the College
• Provide a range of clubs, societies, student-led projects and social activities throughout the year
• Represent the interests of students at local, national and international level
Welcome from the Graduate School

Professor Sue Gibson, 
Director of the 
Graduate School

The Graduate School has several roles but our main functions are to provide a broad, effective and innovative range of professional skills development courses and to facilitate interdisciplinary interactions by providing opportunity for students to meet at academic and social events. Whether you wish to pursue a career in academia, industry or something else, professional skills development training will improve your personal impact and will help you to become a productive and successful researcher. Professional skills courses for Master’s students are called “Masterclasses” and they cover a range of themes, for example, presentation skills, academic writing and leadership skills (http://www.imperial.ac.uk/study/pg/graduate-school/professional-skills/masters/). All Masterclasses are free of charge to Imperial Master’s students and I would encourage you to take as many as you can to supplement your academic training. The Graduate School works closely with the Graduate Students’ Union (GSU) and is keen to respond to student needs so if there is an area of skills training, or an activity that you would like us to offer, but which is not currently provided, please do get in touch (graduate.school@imperial.ac.uk).

The Graduate School also runs a number of exciting social events throughout the year which are an opportunity to broaden your knowledge as well as to meet other students and have fun. Particular highlights include the Ig Nobel Awards Tour Show, the Chemistry Show and the Master’s 360 competition. You should regularly check the Graduate School’s website and e-Newsletters to keep up to date with all the events and training courses available to you.

Finally, I hope that you enjoy your studies here at Imperial, and I wish you well.

Dr Janet De Wilde, 
Head of Postgraduate Professional Development

I would like to welcome you to the Graduate School programme for postgraduate professional development.

Our team of tutors come from a wide variety of experiences and we understand just how important it is to develop professional skills whilst undertaking postgraduate studies and research. Not only will this development improve success during your time at Imperial College, but it will also prepare you for your future careers. We are continually working to develop the courses we offer and over this year you will see a range of new courses including face-to-face workshops, interactive webinars and online self-paced courses.

I encourage you to explore and engage with the diverse range of opportunities on offer from graduate school and I wish you well in your studies.
The Graduate School

You automatically become a member of the Graduate School when you register as a postgraduate student at Imperial.

The Graduate School has been set up to support all postgraduate students at the College through:

- Training and development courses
- Networking activities, social and academic events to encourage cross-disciplinary interactions
- Forums to represent the views of postgraduate students throughout the College

‘Masterclass’ professional skills courses

You can see the full range of free professional skills courses for postgraduate students on the Graduate School website:

[www.imperial.ac.uk/study/pg/graduate-school/professional-skills/masters](http://www.imperial.ac.uk/study/pg/graduate-school/professional-skills/masters)

All courses can be booked online.

Contact us

Level 3, Sherfield Building, South Kensington Campus
020 7594 1383
graduate.school@imperial.ac.uk
[www.imperial.ac.uk/graduate-school](http://www.imperial.ac.uk/graduate-school)

Imperial Success Guide

The Imperial Success Guide is an online resource with advice and tips on the transition to Master’s level study. More than just a study guide, it is packed with advice created especially for Imperial Master’s students, including information on support, health and well-being and ideas to help you make the most of London.

[www.imperial.ac.uk/success-guide](http://www.imperial.ac.uk/success-guide)
Welcome from the Graduate Students’ Union (GSU)

I am delighted to be able to welcome you to Imperial College and to introduce you to the Graduate Students’ Union (GSU). The GSU ultimately serves to represent you as a postgraduate student and to ensure you have the most fulfilling and enjoyable time possible at Imperial.

The GSU is a university-wide representative body for postgraduate students with a committee comprised of democratically elected postgraduate students. The GSU works to support students on welfare fronts, represent students on educational matters by working with you to voice your concerns to College/departments, whilst also hosting recreational events throughout the year.

Imperial College London is undoubtedly a world-class institution with unique strengths in both teaching and research. Having been an Imperial student for 5 years myself I can fully appreciate that the university is nothing more than the people that comprise it – you’re among some of the brightest minds in the world and Imperial welcomes your contributions and enthusiasm in every sense! I encourage you to make the most of being a valued member of the Imperial community.

I hope you have a fantastic time here at Imperial and manage to take advantage of the richness of opportunity that awaits you. If you have any questions at this stage, then please do get in touch.

Luke McCrone, GSU President 2017/18

gsu.president@imperial.ac.uk

www.imperialgsu.com
1. Introduction to the Department

Welcome from the Head of Department

I trust you have had a great summer, whether you were gaining work experience or taking a well-earned rest, and I hope that you are now ready to study again with renewed vigour!

You will be working alongside some of the brightest and most motivated students from around the world, taught by an exceptional group of internationally-leading experts. A strength of our Department, and the College as a whole, is its national and cultural diversity (well over 50 nationalities are represented in our Department alone) and we don’t intend to allow Brexit, or any other outside influence, to change that.

London is a wonderful place to be a student. Please take full advantage of your once-in-a-lifetime opportunity and find a good balance between studying hard to fulfil your potential, and enjoying the company of your fellow students and life in London.

Good luck for the coming year!

Professor Nick Buenfeld

Welcome from the Fluid Mechanics Course Director

It is with great pleasure that I welcome you to the first cohort of MSc in Engineering Fluid Mechanics for the Offshore, Coastal and Built Environments on behalf of all the staff involved in the course. We are very proud to have designed a modern MSc course with the aim of creating a new generation of versatile and multi-disciplinary engineers, who are capable of tackling current and future challenges associated with the offshore, coastal and built environment.

We are inspired by practical applications that require a deep understanding of underlying flow phenomena. Supported by industrial partners, a significant component of the course therefore focuses on engineering design and on turning theory into practice. This MSc will challenge you, but you will look back with pride at your achievements and the course will be a stepping stone to fulfilling your future career aspirations.

I would thoroughly encourage you to make the most of what Imperial has to offer in addition to the course, such as the multitude of clubs and societies. London is also one of the greatest cities on Earth and I advise you to fully capitalise on the opportunity you have to study here.

I look forward to interacting with all of you throughout your time at Imperial and helping you realise your full potential.

Dr Marios Christou
## Academic and administrative staff

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<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Room</th>
<th>Phone</th>
<th>Email</th>
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<tbody>
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New Staff

This section will be updated during the year to reflect any staff changed and posted online.

English language requirement

See the Admissions website for details: www.imperial.ac.uk/study/pg/apply/requirements/english

Information on English language support available while you’re here can be found under section 11 Wellbeing and Advice.

Attendance and absence

You must inform your Cluster Administrator if you are absent from the College for more than three days during term. If the absence is due to illness you must produce a medical certificate after seven days. If you miss an examination through illness you must produce a medical certificate immediately.

Summer Term: Formal teaching may have finished for the year, but while you are working on your project and writing your dissertation, you are still subject to the attendance conditions of your degree, up to the expiry of your student registration at the end of September 2018. The exceptions to this are:

- Short breaks (approved by your supervisor and notified to your Cluster Administrator by email).
- Completion of all the academic requirements of your degree.
- Approved Study leave (e.g. Fieldwork) [specific form to be completed].

Recording of External Study Leave

For those of you spending periods of time abroad which form part of your research project (e.g. Fieldwork), such absences must be covered by the Postgraduate Taught (MSc): Recording of External Study Leave Form (see Appendix A). This form must be completed and submitted, via your Cluster Administrator, in advance of the requested absence. A record will be held in Starfish and you must register your return from Study Leave in person to your Cluster Administrator in order that your record may be updated for audit purposes.

The Registry will be informed of all student non-attendances, as the College is obliged to report the non-attendance of students on Tier 4 visas to the Home Office.

Read through Appendix A – Monitoring Attendance of Students, for information on the procedures in the Department of Civil and Environmental Engineering.
**Key dates 2017-18**

**Term dates**
- Autumn term: 30 September 2017 – 15 December 2017
- Spring term: 06 January 2018 – 23 March 2018
- Summer term: 28 April 2018 – end of course

**Closure dates**
- Christmas/New year: 23 December 2017 – 01 January 2018
- Easter holiday: 29 March – 03 April 2018
- Early May bank holiday: 07 May 2018
- Spring bank holiday: 28 May 2018
- Summer bank holiday: 27 August 2018

**Programme dates**
- Written examinations: January 2018 and April /May 2018
- Project hand-in: 31 August 2018
- Board of Examiners meeting: September 2018 (TBC)
- End of course: 30 September 2018

**Key events**
- Postgraduate Awards Ceremonies: 01 May 2019 (TBC)
- Imperial Festival and Alumni Festival: 28-29 April 2018
2. Programme information

Imperial Mobile app

Don’t forget to download the free Imperial Mobile app for access to College information and services, including your course timetable, College emails and a library catalogue search tool.

www.imperial.ac.uk/imperialmobile

Programme overview

This is a modern MSc programme that will educate future Engineers such as yourselves who would like to specialise in civil engineering fluid mechanics. The offshore, coastal and built environments represent a unique combination of areas, providing students with a well-rounded and broad knowledge of civil engineering fluid mechanics. You will have access to the world-class Hydrodynamics Laboratory at Imperial College London to perform and observe experimental investigations. This will allow you to cement principles taught during lectures, as well as inspiring the future crop of Engineers in Fluid Mechanics. In addition, there is a strong design component to the programme in the shape of four projects to emphasise application and industry relevance. Furthermore, students will also have the opportunity to undertake research with academics within the top-rated Civil and Environmental Engineering Department from recent research assessment exercises.

The aims of our extensive suite of MSc courses are to:

- Attract very able engineers, scientists and related professionals from around the world by offering in-depth courses that focus on particular specialist areas and develop and extend students’ knowledge, professional skills and research experience.
- Meet the expectations of industry and academia, preparing graduates for professional or research careers in the UK and overseas, developing curricula that evolve to match the subjects’ changing requirements.
- Advance understanding of the underlying engineering science and practical techniques that underpin civil and environmental engineering.
- Provide teaching and learning that is informed by research and practice at the forefront of academic or professional disciplines.
- Provide an opportunity for students to show originality in the application of knowledge, and an understanding of how the boundaries of that knowledge are advanced through research.
- Develop students’ ability to deal with complex issues both systematically and creatively, demonstrating originality in tackling and solving problems.
- Engender the qualities needed for employment in circumstances requiring sound judgement, personal responsibility and initiative, in complex and unpredictable professional environments.
- Meet the careers needs of students seeking specialist employment in civil and environmental engineering, addressing the skills needs of their potential employers.
- Provide students with a solid technical basis in the key areas of the engineering profession through delivery of a coherent, coordinated and balanced degree programme, integrating core engineering science with practical application.
- Enable students to acquire a mature appreciation of the context in which engineering projects are developed within the industry.
• Develop our students’ excellence in oral and written communication, and poster presentations.
• Provide students with sufficient material to explore the subject, to carry out self-organised study, and to think about the issues and challenges of the material, in preparation for professional practice.

Programme structure
The full time programme is taken over 12 months, with a single entry point per year at the beginning of October.

Part time option is via term release (taken part time on a term-by-term basis, over two years): http://www.imperial.ac.uk/civil-engineering/prospective-students/postgraduate-taught-admissions/fluid-mechanics-cluster/term-release/

Competency statements
http://www.imperial.ac.uk/media/imperial-college/faculty-of-engineering/civil/public/msc/Competency-Standards.pdf

Accreditation and professional membership
We would like to encourage you to become a Student or Graduate Member of the Professional Institutions in the field that you are studying in. The following professional bodies are relevant for the Master’s programmes that we are running at the Department of Civil and Environmental Engineering. For each of them, we define the most appropriate route for you to become a member:

Institute of Civil Engineers https://www.ice.org.uk/membership/grades-of-ice-membership/student-membership-of-ice

Programme delivery
Modules will be delivered through a series of lectures, although teaching methods will vary between individual modules. Other teaching methods employed may include tutorials, group discussions, group work, progress tests, computer laboratory sessions, practical work, and others depending on the member of academic staff responsible. Some lectures will be delivered by visiting academics or industry professionals, where appropriate.

Submission of Coursework
Coursework submissions may be online or in paper copy, depending on the preference of the setter.

Coursework Cover Sheets
Coursework coversheets for group and individual work can be found in the General Office. Each one contains a plagiarism declaration on the front which must be signed. An example
of the coursework cover sheets used for individual and group work can be found in Appendix E.

Submitting Coursework

MSc coursework will be set with a due date and time, and specific submission information will be made available to students.

Receiving Marked Coursework

Lecturers should return coursework within three weeks of it being handed in (four, if this period includes a College vacation). If there is a delay you should consult your MSc Cluster Administrator.

Returned Marked Coursework

You are required to submit all your marked coursework to your MSc Cluster Administrator, unless instructed otherwise, by the end of the academic session for inspection by the External Examiners.

Penalties for late submission

Submissions made within 24 hours after the deadline has passed will have the mark capped at 50%. Submissions made more than 24 hours after the deadline has passed will receive a mark of zero.

Development of professional skills

Professional skills development will be delivered throughout the curriculum in various forms, including teamwork, problem-solving, applying concepts to real-world situations, and formal presentations.

Module descriptors

A full list of all MSc Fluid Mechanics Cluster module descriptors can be found on the following link:

http://www.imperial.ac.uk/civil-engineering/prospective-students/postgraduate-taught-admissions/fluid-mechanics-cluster/syllabus/

Employability statement

Planning for your future is an important aspect of postgraduate study. At Imperial you’ll be well-supported by our Careers Service, who are on hand to help in a variety of ways.

http://www.imperial.ac.uk/careers

Imperial is one of the UK universities most targeted by graduate recruiters who also play an active role in our career development programme.
This provides access to hundreds of potential employers in a range of settings including industry sector forums, employer presentations, careers fairs, mock interviews and our one to one ‘recruiter-in-residence’ sessions.

A large number of employers also advertise their opportunities each year through JobsLive – our online careers platform, which Imperial students can access from the first day of term.

**Work opportunities**

The Department encourages you to take early advantage of the careers education, information and guidance available from the following sources:

- College Careers Advisory Service (Level 5, Sherfield Building), with which you can book careers appointments, quick interview sessions, skills workshops, mock interviews, and much more.

  [http://www.imperial.ac.uk/careers/](http://www.imperial.ac.uk/careers/)

- The transferable skills training programme run by the Graduate School.

  [http://www3.imperial.ac.uk/graduateschools/](http://www3.imperial.ac.uk/graduateschools/)

- Careers presentations and careers fairs, which occur throughout the autumn and spring terms. Details are circulated to all students closer to the dates.

- Details of jobs will be posted on the careers sections of the website. New posts are notified to us throughout the year, so check online regularly:

  [http://www.imperial.ac.uk/careers](http://www.imperial.ac.uk/careers)

- Additionally you can contact the Departmental Careers Advisor for further guidance and information:

  - Dr Peter Stafford
  - Room 321
  - 020 7594 7916
  - p.stafford@imperial.ac.uk

**Timetable**

Your timetable will be delivered direct to your Imperial College Outlook calendar.

**Research Project**

The Research Project is the main element of coursework submitted for the MSc. A list of research project titles will be circulated by academics and students are are asked to agree a topic in conjunction with their supervisors. It is important that students make clear what part of the Research Project is their own original work.
Research Project work may consist, for example, of an experimental investigation, a numerical project, a literature review, a case history or a parametric study. The work normally continues through from May until the deadline at the end of August, although a report could be handed in earlier if it was complete. All students should make sure that they leave sufficient time to write up their work and prepare their reports to a high standard. **ACADEMIC SUPERVISION CANNOT BE RELIED UPON FROM MID-JULY ONWARDS. STUDENTS SHOULD AVOID TAKING VACATIONS BETWEEN THE END OF SUMMER EXAMS AND THIS PERIOD TO ENSURE THAT THEY ARE SELF-SUFFICIENT WHEN STAFF ARE AWAY.**

The Research Project should demonstrate the student’s mastery of the specialist topic and their ability to both review existing information critically, and add to knowledge through their own research of reinterpretation of data. A literature review that is a straightforward summary of published material would not be passable and so they should contain critical analyses and discussion of the existing literature, as well as recommendations for future research needs.

**Supervision arrangements**

Research projects will differ in their area of focus, but their role is to challenge the student to complete an independent piece of research under the direct supervision of a member of academic staff and may involve supervision from external parties where fieldwork is involved. Staff will provide one-on-one support and students are encouraged to maintain good contact with their supervisor throughout the period of research. The extent and nature of supervision will vary from one member of staff to another, so should a student have any difficulty, during the course of research, interfacing with his/her supervisor s/he should advise the Course Administrator as soon as possible.

**Reading Lists**

The College has introduced a new interactive system, Reading Lists, for students to view their reading lists, and create their own virtual library collections. Each of your modules on Blackboard Learn will include a direct link to the core and supplementary recommended texts on Reading Lists. You can also view where in the Central Library your recommended texts are available, and how many copies are available, as well as commenting and collaborating with other students.


**Programme specification**

Programme specifications will be located here:

Transferring between courses

Students wishing to transfer between courses should first contact the member of staff below, who will advise you as to whether or not this may be possible. Please note that for MSc students, transfers must be requested by the end of the first cycle of lectures, and may be restricted for those students under Tier 4 Visa restrictions.

👤 Dr Marios Christou
✉️ marios.christou@imperial.ac.uk
3. Assessment

The Board of Examiners for the Fluid Mechanics MSc cluster abide by the relevant Imperial College Policy for award of Postgraduate Taught Course Degrees.

For the MSc in Engineering Fluid Mechanics for the Offshore, Coastal and Built Environments the assessments are grouped into three equally weighted elements consisting of:

1. The Autumn Term modules, and
2. The Spring Term modules, and
3. The Research Project.

Master’s students are required to pass every element of their course with an aggregate mark of at least 50%.

The Autumn and Spring Term elements are further broken down into individual components, based on individual modules. Modules are assessed by written examination, group/individual coursework, or a combination of these. One single mark is returned for each component (module) assessment, the pass mark for individual components is also 50%.

Where a candidate has achieved an average of at least 50% in each of the elements, and as long as no mark is below 40% for an individual component, the Board of Examiners may condone marks between 40 and 50%, but the degree award will be capped at Pass Level.

In order to be awarded a result of Merit, a candidate must achieve at least 60% in each element. In order to be awarded a result of distinction, a candidate must achieve at least 70% in each element.

Absent Mitigating Circumstances, candidates required to re-sit examinations or re-submit assessments will have the component marks capped at 50% and their degree awards capped at Pass Level.

Progression

Where a student is not attending or progressing to the satisfaction of the Course Director during the session, a note of warning may be sent to him/her, indicating that a failure to improve will result in a “six-week warning” being sent to them by the College Registry. This is the equivalent to notice of withdrawal and may result in:

- (For Visa-dependent students) a report being sent to the UK-VI, and curtailment of the student Visa, and with this revoking the right to remain in the UK.
- (For sponsored students) a report being made to your sponsors.

Part-time students are permitted to progress to a subsequent year at the discretion of the Board of Examiners, subject to satisfactory performance.

Criteria for the award of the degree

A Pass would normally be awarded when all the following criteria are met:

- The Autumn Term Modules mark is 50% or higher
• The Spring Term Modules mark is 50% or higher
• The Research Project mark is 50% or higher

A Merit would normally be awarded when all the following criteria are met:

• The Autumn Term Modules mark is 60% or higher
• The Spring Term Modules mark is 60% or higher
• The Research Project mark is 60% or higher

A Distinction would normally be awarded when all the following criteria are met:

• The Autumn Term Modules mark is 70% or higher
• The Spring Term Modules mark is 70% or higher
• The Research Project mark is 70% or higher

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<td>A*</td>
<td>Outstanding - distinction standard</td>
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<td>70-84</td>
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The following are subject to discussion by the Board of Examiners

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<td>40-49</td>
<td>D</td>
<td>Unsatisfactory/borderline</td>
</tr>
<tr>
<td>30-39</td>
<td>E</td>
<td>Not satisfactory – may need to be retaken</td>
</tr>
<tr>
<td>0-29</td>
<td>F</td>
<td>Not satisfactory – may need to be retaken</td>
</tr>
</tbody>
</table>

Past examination papers

We are unable to offer past examination papers as this is the first time this course has run. We will however offer revision sessions.

Instruction to Candidates for Examinations:

Students who are candidates for examinations are asked to note that all examinations are conducted in accordance with the College’s Academic Regulations, the Regulations for Programmes of Study and the Examination Regulations.

Instructions for exam candidates can be found here:


The College’s Academic and Examination Regulations:

http://www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/
Mitigating Circumstances Policy and Procedures:

College Policy on Exams and Religious Obligations:
4. Examinations

Examination guidance and regulations

Materials Permitted in Examinations

- Pencil cases which must be clear plastic.
- College identity cards (i.e. swipe card) which must be displayed on your desk.
- Pens, erasers and other drawing instruments as required.

Unless specified or designated “Open Book”, no additional materials may be introduced into examinations by candidates. If, in the opinion of the Board of Examiners, such materials are required, they will be provided or notified to all candidates and the standard examination rubric amended to state that they will be provided or allowed. Calculators will be provided by the Department. We are currently using Casio **FX85GTplus**. Dictionaries are not permitted.

No food is permitted in an examination room unless prior permission has been given due to medical need. No drinks are permitted except for water in clear plastic bottles.

Conduct of Examinations

- Be prepared.
- Take with you only the items listed above.
- Arrive 15 minutes before the exam is scheduled to begin.
- When you enter the examination room, do so in **SILENCE**.
- Switch off your phones (and other electronic devices) and place them in your bag.
- Leave your bags in the area indicated by the Invigilator or Supervising Academic.
- Find the desk with the examination card which has your candidate number (or name) on it, then sit down at this desk.
- **DO NOT turn over or open your examination paper until you are instructed to do so by the Invigilator.** However you may start to fill in the front of your answer book giving:
  1. Candidate number (CID).
  2. Degree (Subject).
  3. Title of Paper.
  4. Date.

- You **MAY NOT SPEAK** to anyone other than the Invigilator. If you do need to speak to the Invigilator, raise your hand. Speak in a quiet voice so as not to disturb the other candidates.
- Write in **black or blue** ink. Candidates **are not permitted to use red** or **green** ink, or to use any writing implement that is capable of producing red or green marks on the script. You should **not** write in **pencil**.
- If unsure of the meaning of a word or question in the examination, write down your interpretation of that word or question, and continue.
- The use of correction fluids (e.g. Snopake® and Tippex®) is explicitly not permitted.
- Candidates should indicate incorrect work by drawing a single diagonal line through the work concerned.
At the end of the examination, stop writing when instructed to do so by the Invigilator or Supervising Academic.

Ensure that your answer book and all supplementary papers carry your College Identifier Number (which is also your candidate number), and that all graph paper and supplementary answer books are securely tied together inside the back cover of the main answer book.

Remain seated and silent. There may be candidates with additional time.

When all examination materials have been collected by the examination team and you have been told you may leave, please do so in silence, collecting your belongings on the way out. You may not remove any examination material from the room.

Exam Technique

Read the rubric carefully BEFORE answering any questions.

Take some time to read through the questions and make a sensible decision as to which questions to tackle.

Ask yourself:
  o Which questions can I answer fully?
  o Out of the questions I cannot answer fully, which ones can I answer the majority of?
  o Am I fulfilling the exam rubric?
  o Example: How much time should you spend answering each question? If there are five questions to complete in three hours, that is approximately 35 minutes per question.

If you make a mistake just put a line through your work.
5. Plagiarism

1. Introduction to Plagiarism

You are reminded that all work submitted as part of the requirements for any examination (including coursework) of Imperial College must be expressed in your own words and incorporate your own ideas and judgements.

Plagiarism, that is the presentation of another person’s work, thoughts or words as though they were your own, must be avoided, with particular care in coursework, essays and reports written in your own time. Note that you are encouraged to read and criticise the work of others as much as possible. You are expected to incorporate this in your thinking and in your coursework and assessments, but you must acknowledge and label your sources.

Direct quotations from the published or unpublished work of others, from the internet, or from any other source must always be clearly identified as such. A full reference to their source must be provided in the proper form and quotation marks used. Remember that a series of short quotations from several different sources, if not clearly identified as such, constitutes plagiarism just as much as a single unacknowledged long quotation from a single source. Equally, if you summarise another person’s ideas or judgements, figures, diagrams or software, you must refer to that person in your text, and include the work referred to in your reference list or bibliography. Staff are able to give advice about the appropriate use and correct acknowledgement of other sources in your own work.

The direct and unacknowledged repetition of your own work which has already been submitted for assessment can constitute self-plagiarism. Where group work is submitted, this should be presented in a way approved by your Department. You should therefore consult your tutor or course director if you are in any doubt about what is permissible. You should be aware that you have a collective responsibility for the integrity of group work submitted for assessment.

The use of the work of another student, past or present, constitutes plagiarism. Where work is used without the consent of that student, this will normally be regarded as a major offence of plagiarism.

Failure to observe these rules may result in an allegation of cheating. Cases of suspected plagiarism will be dealt with under the College’s Exams, Assessments and Regulations, & Plagiarism, Academic Integrity & Exam Offences, a full copy of which can be found at the following: http://www.imperial.ac.uk/student-records-and-data/for-current-students/undergraduate-and-taught-postgraduate/exams-assessments-and-regulations/ and is likely to result in a penalty being taken against any student found guilty of plagiarism.

There have been in the past a few cases of plagiarism in this Department, where we operate a zero-tolerance policy, leading to penalties that range from voiding a coursework mark to expulsion from the course. In the majority of these cases, plagiarism was the result of poor practice and lack of awareness, so you are strongly advised to familiarise yourself with what constitutes plagiarism and to seek clarification if and when in doubt.
2. Ethics and Academic Integrity

There are at least two very good reasons why plagiarism should be allowed no place in the academic business of Imperial College, and why it must therefore be met by severe punishment whenever it is encountered.

At its most fundamental, plagiarism is seeking to deceive somebody – one’s teachers or examiners, for example – by presenting the ideas of another person as though the ideas were one’s own – whether with that person’s assistance, or by theft. Deception and intellectual theft are morally unacceptable in any well-ordered society. In a society of professionally licensed engineers, such conduct is even more reprehensible in that it undermines the ethical foundation on which professional practice is based.

There is also a question of academic integrity. Students who knowingly use plagiarism as a painless way of compiling the work needed for assessments, and teachers who knowingly allow students to do it, are both contributing to a blight that undermines the quality and integrity of the degree qualification.

Students under intense pressure to produce a design, a technical report, or a dissertation may feel tempted to resort to plagiarism. They must resist. The Imperial College degree is highly prized because it is respected far and wide as a true mark of achievement. To safeguard the integrity of its degrees, Imperial College staff must take action whenever plagiarism is suspected. As for students, they must expect that the penalty for a student who is guilty of this offence will normally be severe.

3. Definition of Plagiarism

Plagiarism is the presentation of another person’s thoughts, words, images or diagrams as though they were your own – for example when you copy someone else’s work or use their ideas in your coursework, thesis, report etc, and then do not acknowledge that you have done this.

Definition:

‘The wrongful appropriation or purloining, and publication as one’s own, of the ideas, or the expression of the idea (literary, artistic, musical, mechanical, etc.) of another.’


Other forms of plagiarism include self-plagiarism, which involves using your own prior work without acknowledging its reuse; and collusion, which involves sharing or copying (individual) coursework.

Plagiarism, whether intentional or unintentional, is considered a cheating offence and must be avoided, with particular care on coursework, essays, reports and projects written in your own time, and also in open and closed book written examinations.
Plagiarism is classified as either Minor or Major in nature, this is normally determined by the weight, or marks value, attached to the work submitted. However, the following would also be classified as major:

- Two cases of Minor plagiarism by the same individual
- Copying the work of another student without their knowledge
- Dissertation/Major Project
- Where the student does not admit that plagiarism has occurred, and that the plagiarism offence is upheld on appeal.

You are not permitted to act in collusion with another student or person, nor are you permitted to request or arrange for another individual to submit your coursework for you.

**You must NEVER:**

- Share your coursework, either electronically or in paper copy. If copying of material occurs as a result of such sharing, both parties are considered to have actively taken part in plagiarism.
- Give your coursework, whether electronically or in paper copy, to someone else to submit. If copying of material occurs as a result of such activity, both parties are considered to have actively taken part in plagiarism.

### 4. Collaboration (joint & group work) and Collusion

Students can struggle to understand the difference between collaboration and collusion.

**Collaboration:** Unlike collusion (where the work of another student is intentionally used with that student’s consent) which equates to deception, collaboration is encouraged as a professional skill much needed in engineering work. Collaboration involves mutual effort and joint work, to the benefit of all the parties involved, and where appropriate it should always be acknowledged, via footnotes for example. Students required to submit individual pieces must be clear on the distinction between the two.

Discussing coursework exercise submission with colleagues is fine: – *what does the teacher expect from the work, what different approaches might there be, how much detail would be needed, how structured should the report be?* In exploring with a colleague a range of approaches, or how to obtain specific solutions, one finds a positive help in learning something new. However, if the work is required to be an individual submission, then a line must be drawn where joint work is left behind and the individual work which is submitted for assessment should take over.

The results or calculations that form the basis of the report should be obtained by the individual student who is submitting the report as his/her own work, unless there is a clear expectation that others would be involved – as in the results of a survey – but then the contribution of the others should be made clear (for example, as footnotes in the report). The student is expected to write the report in his/her own words, to think of his/her own interpretations of the results and to make his/her own conclusions and recommendations.
Group work, for example group design projects, is work which is set by the teacher for joint working between two or more students and in which it is clearly understood that the teacher will give the assessment for the joint work undertaken. This provides valuable working experiences and learning opportunities, but these high-minded intentions can be severely undermined if any member of the group should not contribute in equal measure with his/her colleagues.

A student should always assume that coursework is individual work, unless it is clear that group assessment is planned by the teacher. If in doubt, seek the teacher's advice about what working practices are acceptable. Do not hand over your work, under any circumstances, to another student.

Collusion: Where the work of another student is used with that student’s consent.

5. Referencing
The recommended method of referencing is the Harvard style (author-date). All students have free access to RefWorks, an online reference management software package. More information is at the library website:

http://www.imperial.ac.uk/admin-services/library/learning-support/reference-management/

and library staff will provide training (contact details in section 6).

6. Advisory Services

Academic Staff
Your main source of information, and the College’s main source for the recognition of plagiarism, is the academic staff. Please be aware that you can approach them for advice and information if you are unsure or require clarification.

The Library
You can contact your librarian for advice, either in person or by emailing:

Liaison Librarian: Nicole Urquhart, n.urquhart@imperial.ac.uk

Department Librarian: Callum Munro c.munro@imperial.ac.uk

If you do have a query about a reference layout, include as much information as you have about the item you need help with.

The Central Library provides several sources of further information relating to referencing and plagiarism awareness:

- A guide to referencing and citing correctly, including how to use the Harvard style is available at http://www.imperial.ac.uk/admin-services/library/learning-support/reference-management/
• Further information about plagiarism awareness within College, please see the library website at http://www.imperial.ac.uk/admin-services/library/learning-support/plagiarism-awareness/

• In addition you can access the Library’s online Blackboard course, “Ensuring Integrity 1: Plagiarism Awareness” for Master’s students, using your College username and password. The course is available at http://bb.imperial.ac.uk and contains a section on plagiarism and how to avoid it.

Turnitin-UK
TurnitinUK is an online service hosted at www.submit.ac.uk that enables institutions and staff to carry out electronic comparison of students’ work against electronic sources including other students' work. Once papers have been submitted to the system they become part of the database, and will be used for future checking.

IP / Data Protection
Some people have asked whether departments need to seek permission from students before submitting their work to a plagiarism detection system. The answer is no as the registration form, which is signed by students, states the following:

The College may submit your coursework to an external plagiarism detection service. By registering with the College, you are giving your consent for any of your work to be submitted to such a service'.

JISC Plagiarism Advice.org
www.plagiarismadvice.org/

Emphasis is on academic good practice from the lecturer's perspective, but the service can also provide help to students.

7. Submission of Individual Items of Coursework

Copying the work of others without acknowledgement of the source of the information is academic fraud, known as plagiarism. Wilfully copying is outright cheating, forgetting to list references and reference material is ineptitude. Neither form of plagiarism is acceptable and may well result in one or more parties, deemed to be involved, being awarded a mark of zero.

All coursework, project work and research submissions, including dissertation must contain the following statement, signed by the student.
Declaration: I confirm that this submission is my own work. In it, I give references and citations whenever I refer to, describe or quote from the published, or unpublished, work of others.

Signature: ____________________

Failure to submit the signed declaration with all written works will result in their being unmarked, or returned with a mark of zero.

More information on the actions taken by the Department following cases of suspected plagiarism will be provided to you at the time that you are given your first coursework assignments.
6. Board of examiners

**Board of Examiners**

**CHAIR**

- Professor Chris Swan

**EXAMINATIONS OFFICER**

- Dr John Craske

**SECRETARY**

- Miss Rebecca Naessens

MEMBERS: All staff involved in the delivery, setting, and marking of assessment for the programmes.

**For external examiners**

- Professor Thomas O'Donoghue, University of Aberdeen

Master's level students will have the opportunity to meet the external examiner during the assessment process.

It is inappropriate for you to submit complaints or representations direct to external examiners or to seek to influence your external examiners. Inappropriate communication towards an examiner would make you liable for disciplinary action.

External examiner’s reports can be found here:

7. Location and facilities

Imperial has a number of campuses in London and the South East. All have excellent travel links and are easily accessible via public transport.

**Your main location of study will be:**

📍 Department of Civil and Environmental Engineering  
Skempton Building  
South Kensington Campus  
Imperial College London  
London SW7 2AZ

The Skempton building can be accessed from 07.00-00.00 daily. The main entrance requires the use of your college ID card between the hours of 07.00-08.00 and 18.00-00.00. During weekends and vacation periods you will be required to use your college ID card each time you enter and exit the building.

**Smoke-Free Policy**

All Imperial campuses and properties are smoke-free. This means that smoking by staff and students is not permitted on or within 20 metres of College land. The policy covers all College properties, including student accommodation and sports grounds.

🖥️ [www.imperial.ac.uk/smoke-free](http://www.imperial.ac.uk/smoke-free)

**Facilities**

**PC laboratories**

The Skempton Building houses three PC laboratories located in rooms 208, 314, and 317. These facilities are shared space with the Department of Aeronautics and the Department of Mechanical Engineering. They are open to all registered students of the aforementioned Departments from 08.00-22.30 daily, except when timetabled for classes. Further PC facilities are available in, and shared with, the City and Guilds Building, and the College’s Central Library.

A full list of the College rules regarding computer use are available at:

🖥️ [http://www.imperial.ac.uk/admin-services/ict/](http://www.imperial.ac.uk/admin-services/ict/)

**Shared teaching space**

The Faculty of Engineering is committed to utilising its facilities and teaching space, hence there are a number of shared teaching spaces between Departments/Buildings. Teaching space in the Skempton Building is often timetabled to accommodate lectures between the Civil and Environmental, Mechanical, and Aeronautical Engineering Departments.
<table>
<thead>
<tr>
<th>Room</th>
<th>Level</th>
<th>Capacity</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meeting Room 002</td>
<td>0</td>
<td>20</td>
<td>Seminars – presentations</td>
</tr>
<tr>
<td>Teaching Room 060A</td>
<td>0</td>
<td>30</td>
<td>Lectures – tutorials – examinations – presentations</td>
</tr>
<tr>
<td>Teaching Room 060B</td>
<td>0</td>
<td>30</td>
<td>Lectures – tutorials – examinations – presentations</td>
</tr>
<tr>
<td>Teaching Room 060C</td>
<td>0</td>
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<td>Lectures – tutorials – examinations – presentations</td>
</tr>
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<td>Learning Centre 062</td>
<td>0</td>
<td>24</td>
<td>Exams – tutorials – study groups</td>
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<tr>
<td>Teaching Room 064A</td>
<td>0</td>
<td>30</td>
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</tr>
<tr>
<td>Teaching Room 064B</td>
<td>0</td>
<td>27</td>
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</tr>
<tr>
<td>Lecture Theatre 164</td>
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<td>Lectures – presentations – seminars</td>
</tr>
<tr>
<td>Teaching Room 165</td>
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<td>22</td>
<td>Lectures – tutorials – exams – presentations</td>
</tr>
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<td>Laboratory Room 158</td>
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<td>Structures Laboratory</td>
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<tr>
<td>Lecture Theatre 201</td>
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<td>122</td>
<td>Lectures – presentations – seminars</td>
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<tr>
<td>Lecture Theatre 207</td>
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<td>50</td>
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<tr>
<td>Munro Computing Lab 208</td>
<td>2</td>
<td>70</td>
<td>Computing – lectures – tutorials</td>
</tr>
<tr>
<td>Reprographics Room 218</td>
<td>2</td>
<td>N/A</td>
<td>Printing and binding facilities</td>
</tr>
<tr>
<td>Laboratory Room 221</td>
<td>2</td>
<td>N/A</td>
<td>Intelligent Infrastructure Transport Systems (IITS) Laboratory</td>
</tr>
<tr>
<td>Teaching Room 224</td>
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<td>60</td>
<td>Lectures – tutorials – presentations – seminars – practicals</td>
</tr>
<tr>
<td>Mezzanine Lab 240</td>
<td>2</td>
<td>N/A</td>
<td>Workshops – lab practicals – design classes</td>
</tr>
<tr>
<td>Teaching Room 301</td>
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<td>Teaching Room 315</td>
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<tr>
<td>Computing Lab 317</td>
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<td>Library 402</td>
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<td>Meeting Room 444</td>
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<td>Meetings – PhD Exams – presentations</td>
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<tr>
<td>Teaching Room 427</td>
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<td>20</td>
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</tr>
<tr>
<td>Laboratory Room 509</td>
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<td>Environmental Laboratory (Roger Perry)</td>
</tr>
<tr>
<td>Laboratory Room 528</td>
<td>5</td>
<td>N/A</td>
<td>Geotechnics Laboratory</td>
</tr>
<tr>
<td>Teaching Room 601</td>
<td>6</td>
<td>40</td>
<td>Lectures – tutorials – meetings – exams – presentations</td>
</tr>
</tbody>
</table>
While the Department of Civil and Environmental Engineering is housed in the Skempton Building, teaching may also be delivered outside of Skempton, primarily in the City and Guilds Building.

Within the Skempton Building, the teaching areas are to be found on levels 0, 1, 2, 3, and 6, with the exception of the teaching laboratories which are located on levels 0, 1, 2, and 5. [http://www.imperial.ac.uk/engineering/students/current/teaching-spaces/](http://www.imperial.ac.uk/engineering/students/current/teaching-spaces/)

**College ID cards**

For MSc students who have uploaded their photos and registered online, ID cards can be collected from the General Office, Skempton Building following confirmed attendance at the day 2 Health and Safety induction. For those who have their photos taken on arrival, the ID card is normally available from the General Office in the Skempton Building within two days.

**ICT resources**

Find information on activating your College account, connecting to Wifi, using the Virtual Learning Environment (Blackboard Learn), and more ICT resources available for new students, visit: [http://www.imperial.ac.uk/admin-services/ict/new-to-imperial/students/](http://www.imperial.ac.uk/admin-services/ict/new-to-imperial/students/)

**Printing and binding**

There are five multi-function printers in the Skempton Building. The first is in room 317, two are located in the BOSS Space on level 2, and a further two in room 218 adjacent the BOSS Space. Binding facilities are also accessible in room 218.

Additionally the Service Point Print Shop is located in room 024 of the Sherfield Building. Service Point can be contacted by email at: [imperial.college@servicepointuk.com](mailto:imperial.college@servicepointuk.com)

There are networked printers across the South Kensington Campus, which you can access with your College ID card. When you print a document it is sent to a common print queue, meaning that you can collect it from any touch card printer that your College ID card gives you access to, including the Central Library and Departments across the Campus. [http://www.imperial.ac.uk/admin-services/ict/self-service/computers-printing/printing/](http://www.imperial.ac.uk/admin-services/ict/self-service/computers-printing/printing/)

**Lockers**

There are 312 lockers located on Level 3, Skempton, of which 156 have been allocated to MSc students. If you would like to be allocated a locker you need to complete the relevant form below. Lockers can only be allocated to full time students. Numbers are limited and allocated on receipt of the form: [https://skempton.wufoo.eu/forms/z1f2agyq1vq2fj2/](https://skempton.wufoo.eu/forms/z1f2agyq1vq2fj2/)

The Department’s Postgraduate/General Office is located in room 118 in the ground floor of the Skempton Building, open Monday-Friday 08.00-17.30.
Lost property

If you think you have lost something within the Department your first port of call is the Reception. If it is not there you should check with the Security Office in Sherfield as it may have been handed in there. (If an item is handed in with ID, an email will be sent to the owner immediately to inform them).

All items found within the Department (e.g. keys/phones/bags) should be handed into the Reception. All items found outside the Department should be handed into the Security Office in the Sherfield Building in the South Kensington campus. [http://www.imperial.ac.uk/estates-facilities/security/lost-and-found-property/](http://www.imperial.ac.uk/estates-facilities/security/lost-and-found-property/)

Facilities management

Showering facilities are available within the Department, and are located in the toilets on levels 0 and 3.

Bicycles are not permitted within the Department. This is College policy. The following link provides information on suitable bicycle storage within the South Kensington Campus: [http://www3.imperial.ac.uk/estatesfacilities](http://www3.imperial.ac.uk/estatesfacilities)

Room bookings

Room bookings on weekdays during term-time may be requested via an online form, or in person at the Postgraduate/General Office. This form is to be used only for room booking requests in the Skempton Building. [https://skempton.wufoo.eu/forms/ksiogd90gibuje/](https://skempton.wufoo.eu/forms/ksiogd90gibuje/)

Please note: **We do not make room bookings for Imperial College Union Societies.** These need to be made via the Student Union.

Room booking requests outside of normal College hours should be made via the Conference Office: [conferenceandevents@imperial.ac.uk](mailto:conferenceandevents@imperial.ac.uk)

Shuttle bus

A free shuttle bus runs between our South Kensington, White City and Hammersmith Campuses on weekdays. Seats are available on a first-come, first-served basis. You need to show your College ID card to board. Download the timetable at: [www.imperial.ac.uk/estates-facilities/travel/shuttle-bus](http://www.imperial.ac.uk/estates-facilities/travel/shuttle-bus)

Maps

Campus maps and travel directions are available at: [www.imperial.ac.uk/visit/campuses](http://www.imperial.ac.uk/visit/campuses)

Accessibility

Information about the accessibility of our South Kensington Campus is available online through the DisabledGo access guides: [www.disabledgo.com/organisations/imperial-college-london-2](http://www.disabledgo.com/organisations/imperial-college-london-2)
## 8. Working while studying

If you are studying full time, the College recommends that you do not work part-time during term time. If this is unavoidable we advise you to work no more than 10–15 hours per week, which must be principally at weekends and not within normal College working hours.

Working in excess of these hours could impact adversely on your studies or health.

If you are here on a Tier 4 visa you are not permitted to work more than 20 hours a week during term time. Some sponsors may not permit you to take up work outside your studies and others may specify a limit.

If you are considering part-time work during term time you are strongly advised to discuss this issue with your supervisor/cluster administrator/course director. If you are on a Tier 4 visa you should also seek advice from the International Student Support team regarding visa limitations on employment.

Please refer to our policy on working while studying:

[https://www.imperial.ac.uk/study/international-students/visas-and-immigration/work-rules-during-your-studies/](https://www.imperial.ac.uk/study/international-students/visas-and-immigration/work-rules-during-your-studies/)
9. Health and safety

You are responsible for looking after your own health and safety and that of others affected by your College-related work and leisure activities. You must:

- Comply with all local and College policies, procedures and codes of practice and with the arrangements which the College has in place to control health and safety risks.
- Ensure that your activities do not present unnecessary or uncontrolled risks to yourself or to others.
- Attend appropriate induction and training.
- Report any accidents, unsafe circumstances or work-related ill health of which you become aware to the appropriate person.
- Not interfere with any equipment provided for Health and Safety.
- Inform your supervisor or the person in charge of the activity in cases where you are not confident that you are competent to carry out a work or leisure activity safely, rather than compromise your own safety or the safety of others.

The College’s Health and Safety Policy can be found at:


Your Departmental safety officer is:

Dr Geoff Fowler  
Room 413, Skempton Building  
020 7594 5973  
g.fowler@imperial.ac.uk

You are required to complete inductions and attend training sessions to safely complete this course. These include:

- Health and Safety induction, at which a checklist must be completed, signed by the student, and a relevant member of staff (Note: ID cards, available from the Postgraduate/General Office will only be given to those presenting the completed and signed Health and Safety checklist).

A copy of the Department Health and Safety Booklet can be found in Appendix F.

The College Safety Department

The Safety Department offers a range of specialist advice on all aspects of safety. This includes anything which you feel might affect you directly, or which may be associated with teaching, research or support service activities.
The College’s activities range from the use of hazardous materials (biological, chemical and radiological substances) to field work, heavy or awkward lifting, driving, and working alone or late.

All College activities are covered by general health and safety regulations, but higher risk activities will have additional requirements.

The Safety Department helps departments and individuals ensure effective safety management systems are in place throughout the College to comply with specific legal requirements.

Sometimes the management systems fail, and an accident or a near-miss incident arises; it is important that we learn lessons from such situations to prevent recurrence and the Safety Department can support such investigations. All accidents and incidents should be reported online at:

[www.imperial.ac.uk/safety](http://www.imperial.ac.uk/safety)

To report concerns or to ask for advice you should contact your programme director, academic supervisor or departmental safety officer in the first instance. You may also contact the Safety Department directly.

**Occupational Health requirements**

The College Occupational Health Service provides services to:

- protect health at work
- assess and advise on fitness for work
- ensure that health issues are effectively managed

The Service promotes and supports a culture where the physical and psychological health of staff, students and others involved in the College is respected, protected and improved whilst at work.

[www.imperial.ac.uk/occupational-health](http://www.imperial.ac.uk/occupational-health)

**Communications**

It is not possible to provide a service for incoming telephone messages except in the case of emergency. Please ensure that your family/next of kin are aware of the following contacts:

**Civil Engineering General (Postgraduate) Office**

- 00 44 (0) 207 594 5929 (Fionnuala Donovan)
- 00 44 (0) 207 594 5932 (Yamini Chikhlia)
- 00 44 (0) 207 594 5931 (Melanie Hargreaves)
Please ensure that your student-e-service contact details are up-to-date at all times, including your next-of-kin-contact information.

The Department is not able to provide a postal or fax service.

**Working alone and emergency contact numbers**

It is prohibited under College safety regulations for any person to work alone in a laboratory or workshop at any time. At least one other person must be within calling distance. All members of the College must know how to contact emergency services.

Please save the following number in your mobile/cell phone for use in all emergencies anywhere on the College’s South Kensington campus – including where an ambulance is felt to be needed, the call will go direct to the College Security Control Desk: 020-7589-1000

If using an internal College phone, the number to call is 4444.

Any activity involving tools or machinery is deemed to be "working in a laboratory or workshop"; purely office or computing activities are excluded.

(Full details are given at the front of the orange Safety Booklet – see student handbook).
10. College policies and procedures

Regulations for students

All registered students of the College are subject to the Regulations for Students, the College Academic and Examination Regulations and such other regulations that the College may approve from time to time.

www.imperial.ac.uk/about/governance/academic-governance/regulations
www.imperial.ac.uk/students/terms-and-conditions

Appeal and complaints procedures

We have rigorous regulations in place to ensure assessments are conducted with fairness and consistency. In the event that you believe that you have grounds for complaint about academic or administrative services, or wish to appeal the outcome of an assessment or final degree, we have laid out clear and consistent procedures through which complaints and appeals can be investigated and considered:

www.imperial.ac.uk/about/governance/academic-governance/academic-policy/complaints-appeals-and-discipline

Academic integrity

You are expected to conduct all aspects of your academic life in a professional manner. A full explanation of academic integrity, including information on the College’s approach to plagiarism is available on the Student Records and Data website:

http://www.imperial.ac.uk/media/imperial-college/administration-and-support-services/registry/academic-governance/public/academic-policy/academic-feedback/Academic-feedback-policy-for-taught-programmes.pdf

Intellectual property rights policy

For further guidance on the College's Intellectual Property Rights Policy, please contact the Research Office:

www.imperial.ac.uk/research-and-innovation/research-office/ip

Use of IT facilities

View the Conditions of Use of IT Facilities:

http://www.imperial.ac.uk/admin-services/ict/self-service/computers-printing/staff-computers/conditions-of-use-for-it-facilities/
11. Well-being and advice

Student Space

The Student Space website is the central point for information on health and well-being.

www.imperial.ac.uk/student-space

Director of Student Support

The Director of Student Support has overall responsibility for all matters relating to student support and well-being.

www.imperial.ac.uk/people/d.wright

Departmental support and College tutors

In addition to your Personal Tutor, a system of academic and pastoral care is in place to make sure you have access to the appropriate support throughout your time here. This includes:

Postgraduate Tutor

In the event of an issue arising, within the Department there are a number of avenues for you to seek support. This will include your departmental Postgraduate Tutor, and other designated staff such as programme directors and senior administrative staff.

Faculty Senior Tutor

There are a number of avenues within the College to seek help with academic or pastoral matters: http://www.imperial.ac.uk/student-space/. In the event that you would like to seek additional support or guidance, or that you wish to air your issues in confidence, the Faculty Senior Tutor, Dr Lorraine Craig, can be contacted by email l.craig@imperial.ac.uk in the first instance. Depending on the nature of your query, it may be passed onto other more relevant staff.

Advice services

The tutor system is complemented by a College-wide network of advice and support. This includes a number of specialist services.

Careers Service

The Careers Service has strong links to your Department and you will have a named Careers Consultant and Placement and Internship Adviser who will run both group sessions and individual meetings within your Department. You can arrange to meet with your linked Careers Consultant or Placement and Internship Adviser either in your Department or centrally on Level 5 Sherfield where the Careers Service is based.
Visit the Career Service's website to:

- Book a careers appointment
- Find resources and advice on successful career planning

[www.imperial.ac.uk/careers](http://www.imperial.ac.uk/careers)

**Counselling and Mental Health**

The Student Counselling and Mental Health Advice Service offers short-term counselling to all registered students. The service is free and confidential. Counsellors are available at the South Kensington, Hammersmith and Silwood Park Campuses.

[www.imperial.ac.uk/counselling](http://www.imperial.ac.uk/counselling)

**Financial support and tuition fees**

If you've got any questions about student financial support (loans, scholarships and research council studentships, US and Canadian loans) then contact the Student Financial Support team:

- **020 7594 9014**
- **student.funding@imperial.ac.uk**

If you suddenly find yourself in financial difficulties or experience an unexpected change in circumstances, you may be eligible to apply for emergency financial help through the Student Support Fund. The Fund offers a one-off payment of up to £2,000 to cover such emergencies as last minute accommodation and travel necessities, equipment and childcare. It does not have to be repaid.

[http://www.imperial.ac.uk/students/fees-and-funding/financial-assistance/student-support-fund/](http://www.imperial.ac.uk/students/fees-and-funding/financial-assistance/student-support-fund/)

For tuition fees queries, contact the Tuition Fees team:

- **020 7594 8011**
- **tuition.fees@imperial.ac.uk**

**Imperial College Union (ICU) Advice Centre**

Imperial College Union runs the Advice Centre independently of the College with advisers on hand to provide free, confidential, independent advice on a wide range of welfare issues including housing, money and debt, employment and consumer rights, and personal safety.

[www.imperialcollegeunion.org/advice](http://www.imperialcollegeunion.org/advice)
**Student Hub**

The Student Hub represents a single point of contact for all key administrative information and support. The Student Hub team can help you with enquiries about:

- Accommodation (including checking contracts for private accommodation)
- Admissions
- International student enquiries
- Research degrees
- Student financial support
- Student records
- Tuition fees

📍 Level 3, Sherfield Building, South Kensington Campus

📞 020 7594 9444

📧 student.hub@imperial.ac.uk

🌐 www.imperial.ac.uk/student-hub

**Health services**

**NHS Health Centre and finding a doctor**

Even if you’re fit and healthy we recommend that you register with a local doctor (GP) as soon as you arrive in London. For help finding your nearest GP see the Student Space website:

🖥 www.imperial.ac.uk/student-space/here-for-you/find-a-doctor

There is an NHS Health Centre on our South Kensington Campus which you may visit during clinic hours if you’re feeling unwell. Students living within the practice catchment area are encouraged to register with the Centre.

🖥 www.imperialcollegehealthcentre.co.uk

**NHS Dentist (based in the Health Centre)**

Imperial College Dental Centre offers a full range of NHS and private treatment options.

🖥 www.imperial.ac.uk/student-space/here-for-you/dentist
Disability support

Disability Advisory Service

The Disability Advisory Service provides confidential advice and support for all disabled students and students with specific learning difficulties.

If you think you may have dyslexia or another specific learning difficulty but have never been formally assessed, the Disability Advisory Service offers initial screening appointments.

📍 Room 566, Level 5, Sherfield Building, South Kensington Campus
📞 020 7594 9755
✉️ disabilities@imperial.ac.uk
🌐 www.imperial.ac.uk/disability-advisory-service

Departmental Disability Officer

Departmental Disability Officers are the first point of contact within your department. They can apply for additional exam arrangements on your behalf, and will facilitate support within your Department.

Your Departmental Disability Officer is

Mrs Louise Green
📍 Undergraduate Office, Room 401
📞 020 7594 6045
✉️ l.green@imperial.ac.uk

More information on Departmental Disability Officers is available at:

🌐 www.imperial.ac.uk/disability-advisory-service/support/ddos

More information on procedures for the consideration of additional exam arrangements in respect of disability is available at:


If you have any issues regarding a disability that you would like to discuss with your Department, or if you believe you will require special examination arrangements due to a disability, please feel free to speak to Mrs Louise Green in Room 401, or email for an appointment.
Library and IT

Information and Communications Technologies (ICT)

If you’re having problems with technology (including computers, laptops and mobile devices), you can get help from ICT’s Service Desk.

📞 020 7594 9000

🌐 www.imperial.ac.uk/ict/service-desk

Software shop

The Software shop offers a variety of general and subject specific software programs and packages for free or at a discounted price for Imperial students.

🌐 www.imperial.ac.uk/admin-services/ict/shop/software

Central library

The Central Library at South Kensington is open around the clock pretty much all year. Make sure you find out who your departmental librarian is as they’ll be able to help you find resources for your subject area. Also, don’t forget to check out the Library’s range of training workshops and our other campus libraries for access to specialist medicine and life sciences resources. Alongside these physical spaces and resources, the Library provides over 170,000 electronic books, journals and databases available both on and off campus and a free document delivery service to help you source books and articles from around the UK and the rest of the world.

🌐 www.imperial.ac.uk/library

Departmental library

The Civil Engineering Library is open exclusively to students and staff of the Department. Funded by the Department, the Library hosts a collection of around 15,000 books, 400 online and print journal titles, a large collection of reports from industry, and historical collections. It is open from 9.30 to 17.00 on weekdays (20.00 on Thursday) with opening extended to 21.00 during examination periods.

Our dedicated Librarian offers support with coursework in one-to-one or group format, including how to find the best information for your study. The Library engages with students via Twitter @CivEngLib.

Further information about the library and its services is available from the library staff and from the Departmental Library webpage:

👤 Callum Munro

📍 Departmental Library, Room 402

🌐 http://www.imperial.ac.uk/civil-engineering/about-us/library/
**Institution of Civil Engineers Library (ICE)**

The library located at the Institution of Civil Engineers (ICE) is home to the world’s largest dedicated collection of civil engineering materials. In addition to printed books and journals, the ICE library also offers access to a number of digital services, including e-books and advanced search tools, and a quiet place to work. All ICE members can borrow up to three items in person, or by post.

**Institution of Civil Engineers Library**

1 Great George Street, London, SW1P 3AA

📞 020 7665 2251

✉️ library@ice.org.uk

🌐 https://www.ice.org.uk/disciplines-and-resources/ice-library-and-digital-resources

**Religious support**

The Chaplaincy Multi-Faith Centre has chaplains from many different religions, as well as prayer rooms and information on places of worship. In addition, it runs meditation classes and mindfulness workshops for stress management. There is a student-run Islamic prayer room on campus and separate areas available for male and female Muslims.

🌐 www.imperial.ac.uk/chaplaincy

**Support for international students**

**English language support**

The Centre for Academic English provides free in-sessional English courses for international students while they are studying. These include classes and workshops on academic language, social language, the four skills of reading, writing, listening and speaking, 1-1 consultations with a tutor to work on a piece of academic writing or an oral presentation, self-study resources in the VLE Blackboard, and the Conversation Project, which partners students with a native-speaker volunteer to practise social and conversational English.

🌐 www.imperial.ac.uk/academic-english

**International Student Support team**

Students from outside the UK make up around half of our student population, so our International student Support team offers year-round support to help our international students settle into Imperial life. This includes UK visa and immigration advice and trips to different places of interest.

🌐 www.imperial.ac.uk/study/international-students
12. Student Records and Data

The Student Records and Data team are responsible for the administration and maintenance of the student records for all students studying at the College. This includes enrolments, programme transfers, interruption of studies, withdrawals and processing of examination entry for research degree students. The team also use this information to fulfil reporting duties to the Student Loans Company, Transport for London and the UKVI, as well as other external bodies.

The team is currently responsible for the processing of student results and awards on the student record system as well as the production and distribution of academic transcripts and certificates of award.

Student Records and Data produce a variety of standard document requests for both current and previous students including council tax letters, standard statements of attendance and confirmation of degree letters.

Appeal administration also sits within the team, as does the responsibility for confirming qualifications via the Higher Education Degree Datacheck service.

**Student records and examinations**

📞 +44 (0)20 7594 7268  
✉️ records@imperial.ac.uk

**Degree certificates**

📞 +44 (0)20 7594 8037  
✉️ certificates@imperial.ac.uk
13. Work-life balance

The pace and intensity of postgraduate study at Imperial can be demanding so it’s important to find time for outside interests.

Civil Engineering Society (CivSoc)

The Civil Engineering Society is the departmental student society, of which all Undergraduate and Postgraduate students are automatically members. Run by an elected committee of students, CivSoc is one of the most active departmental societies in the College and organises regular events throughout the academic year. These include numerous lunchtime lectures given by industrial companies, site visits, social events and parties. The highlight of the CivSoc year is the extremely popular international trip in the spring, open to all students in the Department. Additionally, CivSoc writes and publishes the departmental student newspaper LIVIC.

All students are encouraged to participate in CivSoc-run activities. Announcements concerning upcoming events and society news are emailed to all members, displayed on the screen in the second floor Breakout Student Space, as well as being available on CivSoc’s website and social media pages.

Chair: Susie McAllister

Treasurer: Yimo Yan

Secretary: Max Castello

Industrial Liaison Officer: Cheng Kwang

Tour Officer: Hippolyte Mounier-Vehier

Events Officer: Christina Trigle

LIVIC Editor: Jian Chew

Marketing and Web Officer: Remi Pelletier

Alumni and Mums & Dads: Ottilie Shiyong Liu

Department Representative: Marthe Boulleau
**Imperial College Union**

The Union’s range of 375+ student-led clubs, societies and projects is one of the largest of any UK university, opening up lots of ways for you to enjoy your downtime.

[www.imperialcollegeunion.org/about-us](http://www.imperialcollegeunion.org/about-us)

**Graduate Students’ Union**

The Graduate Students’ Union is the postgraduate arm of Imperial College Union. The GSU works alongside the Imperial College Union President to ensure that the requirements of postgraduate students are catered for. It also organises a number of academic and social events during the year.

[www.union.ic.ac.uk/presidents/gsu](http://www.union.ic.ac.uk/presidents/gsu)

**Sport**

Imperial College has a wide range of sports and activities on offer that cater for all standards and abilities. We have a recreational activity offer, competitive sports teams and an elite sport programme. We are dedicated to ensuring we have a diverse, inclusive and exciting offer for all.

After a one off induction fee of £40 you will get free use of the gym and swimming facilities on our campuses.

[www.imperial.ac.uk/sport](http://www.imperial.ac.uk/sport)
14. Student feedback and representation

Feedback from students

The College and Union is committed to continually improving your education and wider experience and a key part of this is your feedback. Feedback is thoroughly discussed by your student representatives and staff.

Student representation

Student Representatives are recruited from every department to gather feedback from students to discuss with staff. More information about the role, and instructions on how to become an academic representative, are available on the Imperial College Union (ICU) website.

www.imperialcollegeunion.org/your-union/your-representatives/academic-representatives/overview

Due to the number and complexity of our MSc programme configuration, elections to the positions of Programme Student Representatives are managed within the Department. You will be advised of the processes, both on self-nomination for the positions, and the selections processes, during the cluster induction sessions. Typically we look for one representative from each of the core programmes and one or two from Business Management.

Staff-Student Committee

The Staff-Student Committee is designed to strengthen understanding and improve the flow of communication between staff and students and, through open dialogue, promote high standards of education and training, in a co-operative and constructive atmosphere. College good practice guidelines for staff-student committees are available here:

www.imperial.ac.uk/about/governance/academic-governance/academic-policy/student-feedback

There are three committees: Undergraduate, Master’s and Research Students/Staff. They meet once each term, and their remit is as follows:

- To provide a forum for debate about important matters.
- To receive feedback from students.
- To initiate enquiries or investigations on matters of concern to students.
- To represent the interests and requirements of the student body.
- To air grievances.

The membership is drawn from the student body, with members being elected by their peers at the beginning of term, the Student Union, the Graduate Student Association and relevant Departmental Officers.

The Undergraduate SSLC is chaired by the Director of Undergraduate Studies and both the MSc and PhD are chaired by the Postgraduate Tutor, with the Departmental Postgraduate Representative acting as Deputy-Chair.
15. Student surveys

Your feedback is important to your Department, the College and Imperial College Union. Whilst there are a variety of ways to give your feedback on your Imperial experience, the following College-wide surveys give you regular opportunities to make your voice heard:

- PG SOLE lecturer/module Survey
- Student Experience Survey (SES)
- Postgraduate Taught Experience Survey (PTES) – next due to run in spring 2018

The PG SOLE lecturer/module survey runs at the end of the autumn and spring terms. This survey is your chance to tell us about the modules you have attended and the lecturers who taught them. For PG SOLE your lecturers will receive their individual numerical results and comments shortly after the survey closes. To make the most of your opportunity to give your feedback, please do not use offensive language or make personal, discriminatory or abusive remarks as these may cause offence and may be removed from the results. Whilst this survey is anonymous, please avoid self-identification by referring to personal or other identifying information in your free text comments.

The Student Experience Survey (SES) is another opportunity to leave your views on your experience. This survey will cover your induction, welfare, pastoral and support services experience.

The Postgraduate Taught Experience Survey (PTES) is the only national survey of Master’s level (MSc, MRes, MBA and MPH) students we take part in. This is the only way for us to compare how we are doing against the national average and to make changes that will improve our Master’s students’ experience in future. PTES covers topics such as motivations for taking the programme, depth of learning, organisation, dissertation and professional development. PTES last ran in spring term 2016 and will run again in spring 2018.

All these surveys are anonymous and the more students that take part the more representative the results so please take a few minutes to give your views.

The Union’s “You Said, We Did” campaign shows you some of the changes made as a result of survey feedback:

www.imperialcollegeunion.org/you-said-we-did

If you would like to know more about any of these surveys, or see the results from previous surveys, please visit:

www.imperial.ac.uk/students/academic-support/student-surveys/pg-student-surveys

For further information on surveys, please contact the Registry’s Surveys Team at:

surveys.registrysupport@imperial.ac.uk
16. And finally

Alumni services

When you graduate you will be part of a lifelong community of over 190,000 alumni, with access to a range of alumni benefits including:

- Discounts on further study at the College and at Imperial College Business School.
- Alumni email service.
- Networking events.
- Access to the Library and online resources.
- Access to the full range of careers support offered to current students for up to three years after you graduate.
- Access to our Alumni Visitor Centre at the South Kensington Campus, with free Wifi, complementary drinks, newspapers and magazines, and daytime left luggage facility.

Visit the Alumni website to find out more about your new community, including case studies of other alumni and a directory of local alumni groups in countries across the world.

www.imperial.ac.uk/alumni

Opportunities for further study

After you have completed your Master's programme, you may choose to continue your studies on a PhD, CDT or other CPD programme at Imperial.

http://www.imperial.ac.uk/civil-engineering/prospective-students/postgraduate-research-admissions-phd-engd-mphil/

Explore the Departmental Alumni Profiles to find out what previous graduates have gone on to achieve:

http://www.imperial.ac.uk/civil-engineering/alumni/alumni-profiles/

STAY CONNECTED

Department of Civil & Environmental Engineering

Department Alumni  cv-alumni@imperial.ac.uk

Join the Imperial College alumni
www.imperial.ac.uk/alumni

Follow us on twitter @ImperialCiveng  flickr
Appendix A: Monitoring Attendance

Since the introduction of Tier 4 of the Points Based System in March 2009, the College has held a license permitting us to sponsor the visas of students from outside the European Union to enable them to attend our courses.

Sponsorship of students, under our Tier 4 Visa License, brings with it an obligation for us to inform the Home Office whenever we withdraw sponsorship from a student. This may be as a result of a student withdrawing or being expelled from their course, interrupting their studies, or not being in attendance. This is reflected in the College’s regulations and procedures to ensure the welfare and academic progress for all students. See Academic Regulation Paragraph 9.4 of the General Regulations for Students:


The College does not wish to discriminate in its treatment of students from outside the European Union, and so all procedures for monitoring attendance and reporting student activity apply equally to all students.

The procedure for compliance adopted for the Master of Science Programme within the Department of Civil and Environmental Engineering is to base the monitoring of attendance around a number of ‘check-points’, which are:

- Start-of-Session Induction.
- Confirmation of attendance at the Health and Safety Induction, which is a requirement of the College for issue of ID cards.
- Submission of selected items of coursework.
- Attendance at Field Trips/Site Visits.
- Examinations and Progress Tests.
- Randomly selected lectures/laboratories/tutorials.
- Scheduled meetings with Personal Tutors and/or Project Supervisors.

In order to make this process efficient, the following shall apply.

- The Cluster Administrator shall conduct the monitoring using a class list supplied by Imperial College Registry.
- There shall be one location (which will be notified to you by email) for the submission of randomly selected coursework related assessment items.
- Each student shall sign the class list at each check-point.
- The Cluster Administrator shall inform the relevant Senior Tutor and Course Director of any student who fails to interact with the College on three consecutive occasions.
- The student will be invited for interview, and a warning issued.
- If non-attendance continues, the Senior Tutor shall inform the Head of Department and the College Registry.
- The Imperial College Registry report directly to relevant authorities, including HEFCE, the UK-VI and sponsors.

The Department expects students to demonstrate their commitment to their degree programme by attending lectures and submitting coursework on time. If students cease to
engage properly with the course, e.g. by being absent without permission or adequate cause, this may be reported to the relevant authorities, and may result in being asked to leave the College. In the case of those attending with Student Visas, this could jeopardise the individual’s ability to stay in the UK.

Internships
Postgraduate students can only undertake work placements if they are an approved part of their course of study. Students who may wish to interrupt their studies to take an internship (in the UK or overseas) will have the sponsorship of their visa withdrawn and will need to apply for a new visa in order to return to their course at a later date.
**Department of Civil and Environmental Engineering**

**Postgraduate Taught (MSc): Recording of External Study Leave Form**
*(please see notes overleaf)*

This form must be completed by the Student and Supervisor and returned to the Cluster Administrator for processing

<table>
<thead>
<tr>
<th>CID No:</th>
<th>Date of Initial Degree Registration:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Student’s Surname:

Student’s Forename(s):

Supervisor(s)  
(print name(s)):

Research Topic

Are you a Tier 4 Student?  If yes, please seek advice immediately from the Visa Compliance Team (see notes)  
YES  /  NO

List any previous periods of external study leave:

<table>
<thead>
<tr>
<th>Details of External Study Leave</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Details of remote location:

<table>
<thead>
<tr>
<th>Departure date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return date:</td>
</tr>
</tbody>
</table>

Purpose and relevance of external study leave:  
Eg. Site visits, field work, remote data gathering

Details of remote contact:  
(in case of emergency)

<table>
<thead>
<tr>
<th>The following to be completed by the principal supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>I approve this period of study leave and confirm that I will maintain regular contact with the student named above</td>
</tr>
</tbody>
</table>

Signature of supervisor(s):

<table>
<thead>
<tr>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
NOTES

Recording Study Leave.

This form should be used to cover any and all study time which is spent outside of the UK.

to for the following situations:

a. Field work and data collection.
b. Study Leave which is not subject to the Placement Learning Policy, such as extended field work. The College’s Off-Site Working procedures should be followed: http://www.imperial.ac.uk/safety
c. For Tier 4 students the College is required by UKVI to report any time away from the College as a ‘change of study location’ within 10 days of this change taking place. This will not impact on a student’s visa status in the UK.

The form to be:

- completed by the student,
- authorised by the supervisor
- submitted to the Cluster Administrator (who will file a digital copy with the General Office, Skempton Building (cvpgo@ic.ac.uk))

The General Office will be responsible for any further notifications required.

For students with Tier 4 visas

The Visa Compliance Team may be contacted by email on visacompliance@imperial.ac.uk for advice.

Queries regarding this form should be addressed to Fionnuala in the General Office or by email to flo@ic.ac.uk.
Appendix B: Disabilities Statement

Information for students with disabilities, specific learning difficulties or long-term health issues

At Imperial College we recognise that studying at university can be a challenge, especially if you have a disability. We are keen that you have every opportunity to fulfil your potential and graduate with the degree you deserve. It is therefore important that you let us know about any disability, specific learning difficulty or health problem as soon as possible so that we can arrange expert advice and support to enable you to do this.

Some people never think of themselves as having a disability, but students who have experienced any of the issues listed below have found that a little extra help and support has made all the difference to their study experience.

- Specific learning difficulties (such as dyslexia, dyspraxia, AD[H]D).
- Autistic spectrum disorder (such as Asperger’s).
- Deafness or hearing difficulties.
- Long term mental health difficulties (such as chronic anxiety, bipolar disorder, depression).
- Medical conditions (such as epilepsy, arthritis, diabetes, Crohn’s disease).
- Physical disabilities or mobility impairments.
- Visual difficulties.

Where to find help:

Departmental Disability Liaison Officer

Mrs Louise Green
l.green@imperial.ac.uk
Room 401
020 7594 6045

Mrs Green is your first point of contact within your Department and is there to help you with arranging any support within the Department that you need. She is also the person who will apply for special examination arrangements on your behalf. You need to contact her without delay if you think that you may need extra time or other adjustments for your examinations.

Disability Advisory Service

The Disability Advisory Service works with individual students no matter what their disability or level of study to ensure that they have the support they need. Our advisors are committed to providing the best possible support for all students at Imperial College. They understand that each person's disability can affect them in different ways and therefore the support offered is flexible and tailored to you. We can also help if you think that you may have an unrecognised study problem such as dyslexia. The Service is confidential and information about your support needs is only passed on to others within the College with your agreement and then only in order that you are fully supported. Our advisors never pass on information outside the College or to parents unless you ask them too.
Some of the sorts of things the Disability Advisors can help with are:

- Checking that your evidence of disability is appropriate and up-to-date.
- Arranging a diagnostic assessment for specific learning difficulties.
- Making recommendations for additional exam arrangements, for example extra time or rest breaks.
- Drawing up a “Suggested Reasonable Adjustment” document for you to share with your Department which outlines all of your support needs.
- Arranging and funding the support you need. This can include:
  - Note taking, study skills or mentoring support.
  - Purchasing disability related equipment (NOT computers).
  - Funding taxis for those who need help with transport.
- Help with arranging extra Library support and access to the Assistive Technology Suite
- Supporting applications, where appropriate, for continuing accommodation for your second or later years.

A disability is any long-term condition that has a substantial impact on your ability to study effectively, such as:

- A specific learning difficulty, e.g. dyslexia, dysgraphia.
- An enduring mental health condition, e.g. depression, OCD, generalised anxiety disorder.
- A visual, hearing or other sensory impairment.
- A long-term medical condition, e.g. IBS, ME, diabetes.
- A social/communication difficulty, e.g. autistic spectrum/Asperger’s syndrome.
- A mobility or dexterity issue.
19. Appendix C: Revision and Exam Stress

Stress

During revision and exam periods, anxiety and stress are very common problems for students – even for those who appear confident and calm. Don’t despair; you are not alone.

A small amount of anxiety can actually be beneficial, it can make you alert and focused, but too much anxiety means you will have trouble thinking clearly and this means you aren’t likely to do your best work.

What exactly is stress?

Stress is the body's normal response to a challenge, threat or excitement. The consequence of stress depends largely on how you interpret the physical symptoms; it can help motivate you or it can paralyse you.

Take the following scenario:

- Joe: a student just before a critical exam
- Jane: an athlete just before a big competition
- Both Joe and Jane are aware of the same physical symptoms:
  - sweaty palms
  - racing heart
  - knot or butterflies in the pit of the stomach

Joe, the student, feels distressed by his symptoms and views them negatively, as if the symptoms are a sign of impending failure. Joe may have trouble sleeping and spend a lot of time worrying about his physical condition and the upcoming exam.

Jane, the athlete, interprets her symptoms as a sign that she can motivate herself to perform well. She views the symptoms as evidence that she is “psyching herself up” for the big competition.

The bottom line?

Stress can be a barrier to optimal performance or a motivating agent; it all depends on how you interpret, label and manage what you are experiencing.

The trick is to figure out what level of stress is motivating for you and what amount is paralysing and then work to keep it in the motivating zone.

Anxiety

Anxiety is very common and many people find ways of overcoming it or coping with it without seeking professional help. However, for some people anxiety can be harmful, it can affect your physical health, or your fears can take over your life and stop you doing the things you want to do. The good news is that there are things you can do to help.

Managing anxiety
1) Identify trigger factors
The first step in managing anxiety is to identify the specific situations that are making you stressed or anxious and when you are having trouble coping. One way to do this is to keep a diary of symptoms and what is happening when anxiety occurs. It is also helpful to identify any worrying thoughts as this can lead to finding ways to solve the specific problem that is of concern.

2) Thought management
Thought management exercises are useful when a person is troubled by ongoing or recurring distressing thoughts. There are a range of thought management techniques. For example, you can use distraction with pleasant thoughts. This can help take attention away from unpleasant thoughts. Alternatively, one can learn ‘mindfulness techniques’ to direct attention away from negative thinking and treat thoughts as just thoughts and not facts. The choice of thought management technique will depend on the type of anxiety problem. A psychologist can help you decide on thought management strategies that are likely to be most helpful.

3) Talk about it
Try a friend or relative who you trust and respect, and who is a good listener.

4) Learning to relax
People who feel anxious most of the time report that they have trouble relaxing. Knowing how to release muscle tension is an important anxiety treatment. Learning a relaxation technique and practising it regularly can help a person to maintain a manageable level of anxiety. You can learn these through groups, with professionals, but there are several books and self-help materials you can use to teach yourself. It’s a good idea to practice relaxation regularly, not just at times of crisis.


Managing revision stress
Take a look at the three categories outlined below and see which one best describes the type of student you are. Some students get stuck in one pattern – others may pass through each phase.

When you have identified what type of student you are or what phase you are currently in, click on the appropriate link below for tips on how to help yourself.

Which type of student are you?

1. The Self-Indulgent student
   - denial of responsibility / or overconfident
   - not lazy, but has low frustration tolerance
   - escapist tendencies
   - requires stimulus to raise anxiety (e.g. approaching deadline)

2. The Tense & Fearful student
• denial of potency – deskilling self unnecessarily
• self-critical, low self-esteem
• overwhelmed by the importance of the exam, pressure to succeed

3. The Perfectionist student

• denial of vulnerability, wanting total control
• critical of the “system”, passive-aggressive
• sets impossible goals, so never feels “good enough” or “safe enough”
• obsessive, workaholic tendencies; or procrastination
• http://www.imperialcollegehealthcentre.co.uk/exams-and-stress/managing-revision-stress/perfectionist-student/

Study and exam strategies

Organise

• Sort out your topics for revision. Base selection of topics on syllabus and examination requirements, on predictions derived from past papers and on guidelines suggested by tutors.
• Devise a routine of study periods that is realistic and productive, and includes rest intervals!
• Pay attention to diet, sleep and recreation – all are important factors in maintaining balance and keeping stress levels under control.
• Breakdown targets into manageable units. Ticking off completed units creates a sense of forward movement. A checklist for the day’s targets (making sure the targets are realistic and achievable) can also boost morale.
• Use your time wisely – deal with less demanding tasks in periods of the day when you are less alert or focused. If you find yourself struggling unproductively with a problem, take a break or switch to some other work.

Maximise your learning

• The more you actively interact with the subject matter, making it your own, and linking it to previous knowledge, the more meaningful and memorable it becomes.
• Follow the PQRST model:
  o Preview – skim the material to get an overall preview
  o Questions – formulate questions that highlight what you aim to derive from your reading
  o Read Actively – make appropriate notes of key ideas
  o Summarise – identify the main points using lists, key words, flow diagrams, etc. and connect them with knowledge from other sources
  o Test – test yourself by reciting and reviewing the summaries immediately after learning the material and again at later intervals

Tips

• Use flow diagrams, keywords or patterns linking ideas to make master summaries for revision purposes.
• Use cue cards! Index-sized “flash” cards are easy to carry around and are useful for learning information you find particularly hard to remember. You can put facts, figures, formulae on the cards and use colours, keywords, mnemonics and other memory aids to help you learn.

• Space your studying and give yourself time for the information to sink in. Study related topics together and take regular, short breaks at suitable “achievement points”.

• Compare notes with other students and get feedback and/or clarification from tutors.

General exam strategies

Conquering exams: strategies and skills

• Practical preparation: Check the time and venue of the exam and figure out how to get there in good time, and have the necessary equipment ready (e.g. pens, ID card, clear bottle of water etc.)

• Emotional preparation: Mentally rehearse how to tackle the exam as a whole and review your strategies for dealing with anxiety. Consider what might also help, for example, staying away from crowds gathering outside exam halls.

• Memory considerations: Systematically review your revision notes the night before or the morning of the exam, but don’t attempt to learn complex new material at this late stage. Capitalise on short-term memory by glancing at your “difficult” cue cards just before entering the exam hall, then try reproducing them immediately when you are allowed to start.

Exam skills

Read the exam paper carefully and underline key words and instructions.

Don’t panic – if you feel unable to answer any of the questions at this stage it is likely due to a surge in anxiety.

• Note how many questions you are required to answer and if any are compulsory.

• Tick the questions you intend to answer. Make a rough timetable, allocating equal time to equally weighted questions. Allow for about 15 minutes of “planning” and 10 minutes of “finishing off” time overall for a typical 3 hour exam.

• Avoid getting demoralised at the start. Answer the easiest question first and save the most difficult one for last. Attempt all the questions required – usually the first 50% of marks for any question are easier to obtain than the next 50%.

• Watch the wording of the questions. Answering a question that wasn’t asked means no marks, no matter how thoughtful your answer was!

• Jot down key ideas that emerge about any of the questions and use them for “planning” an answer. This might show the examiner what you had in mind in case you run out of time.
• Save the last 5-10 minutes for “finishing touches” e.g. crossing out unwanted script, ensuring that questions are clearly numbered, and that all answer books have your identification number.

Sitting the exam

What if I get a mental block during an exam?

• Give yourself a couple of minutes to try to remember or puzzle out the answer. If you are still blocked, move on to the next question. If ideas for dealing with the question pop up while working on another one, jot them down before you forget them.
• With mathematical questions it pays to stick with the problem a bit longer, say 10 minutes. Try thinking back to first principles or representing the problem diagrammatically or more concretely, or think laterally about related issues.
• Adjust your timetable and still attempt all the required questions.

What if I panic during an exam?

If you start panicking in the exam, and you find that the harder you try to work the worse you feel, practise “Stop the Wasp”:

• STOP – the self-defeating thoughts that are buzzing around like wasps. Tell yourself instead that you are going to survive this experience, come what may. Go through the following “W-A-SP” squashing procedure, which you’ll need to practise during milder forms of anxiety in the revision period (so you can learn to recognise the early stages of panic, which are easier to neutralise).
• Familiarity with the procedure, through practice and mental rehearsal is essential emotional preparation.
• WAIT – switch off and unwind for a few moments. Focus on breathing and then relax with eyes closed. This will help you return to the task afterwards with a calmer, clearer mind and a more constructive perspective.
• ABSORB – taking in the relaxation, flood your mind with constructive self-talk (ideally from a repertoire of previously prepared and practised phrases), then slowly open your eyes and calmly bring yourself to face the exam situation.
• SLOWLY PROCEED – calmly get going again with the paper, as best you can, one step at a time.

Keep in mind:

• When focusing on your breathing, take a long, slow, deep breath, and allow the air to flow out slowly and smoothly. Sit back comfortably, dangling your arms by your side, and imagine any tension flowing out through your hands and feet. Try any relaxation strategy that works for you.
• If your breathing pattern has been rapid and shallow, you may be at risk of hyperventilating. Instead, pause after long exhalations, and breathe you’re stomach, rather than upper chest, movements. If you continue to hyperventilate, breathe into cupped hands (or even a paper or plastic bag – take one along if you think you’ll need it).
• It may help to reframe your attitude towards the examiner. Instead of some sadistic, persecuting figure, imagine him or her as a friend, or someone who just wants some help with the question.
Repeat “Stop the Wasp” if necessary – you may have rushed back too soon the first time. Stay longer “waiting” and “absorbing”. If the panic continues or escalates, tell the invigilator without delay.

**After the exam**

Don’t indulge in post-mortems and comparisons with others. Review what went well in your overall approach, including how you handled anxiety, and aim to improve upon it in your next exam.
The Policy and Procedures contained in this document apply to all students and former students at Imperial College registered for Imperial College or University of London awards. A complete copy of the College regulations governing Cheating Offences: Policy and Procedures, under which Plagiarism is categorised, is available to download from the following link:


In any proceedings under these Policy and Procedures, the student shall be presumed to be innocent until the contrary is established beyond reasonable doubt.

Where the offence is an instance of suspected plagiarism, it shall be dealt with in accordance with the following procedures, commensurate with the severity of the suspected offence.

If you are not sure, please ask. Useful reference points are academic and library staff.

Plagiarism is defined as the presentation of another person’s words, ideas, judgement or data as though they were your own. For example; not referencing the source of your ideas or arguments when they have derived from your reading; taking verbatim the words of someone else’s work and putting it into your project without quotation marks and referencing; taking whole sections out of books, the internet, articles, lecture notes, other reports or other students’ work, and including them in your report uncited. It may also occur in formal written examinations, the above document addresses this possibility. An example might be where candidates have been able to learn text by heart (by rote) and simply reproduce this without acknowledgement of source. Where the examination is based on technical knowledge, this may be acceptable and not regarded as plagiarism. In other subjects where candidates are asked to write essay-type questions, the examiners may regard text reproduced without reference or critical analysis as plagiarism. This will be clarified, where appropriate, in the examination rubric on the front page of the examination paper.

You should be aware that you have a collective responsibility for the integrity of group work submitted for assessment. This means that if part of the work is plagiarised, all group members will be held accountable unless proof can be provided by each individual member of their contribution. You should, therefore, retain an audit trail of your contribution for this purpose.

When submitting (both individual and group) assessed coursework you will be required to complete and attach a Coursework Cover Sheet (examples on the following page) confirming that you have read and understood the definition of plagiarism. Submitting this form will certify that the work presented is entirely your own, except where indicated.

Plagiarism is a serious offence. The Examination Board reserves the right to take further action as it deems appropriate to protect the name of the Department and the College, and this may involve expulsion of a student from the programme or delay or withdrawal of a degree award.
Coursework and Project Cover Sheet

MSc in Fluid Mechanics Cluster

Department of Civil and Environmental Engineering

Surname _______________   First Name ______________   CID ____________

Module _________________________________________________________________

Assignment_____________________________________________________________

Supervisor _____________________________________________________________

Submission Date ______________________________________________________

DECLARATION

I certify that I have read the definition of plagiarism given overleaf, and that the work submitted for this coursework assignment is my own work, except where specifically indicated otherwise. In signing this document I agree that this work may be submitted to an electronic plagiarism test at any time and I will provide a further version of this work in an appropriate format when requested:

Signature: ___________________________    Date: __________________________

Note: Until an assignment carries this completed front page it will not be accepted for marking. If the front page is absent, the delay in getting it added may result in a penalty for late submission.

TO BE COMPLETED BY THE MARKER

Grade awarded: ____________________________

Late penalty applied: ____________________________
Module _________________________________________________________________

Assignment_____________________________________________________________

Deadline ________________________________________________________________

DEALERATION

I certify that I have read the definition of plagiarism given overleaf, and that the work submitted for this coursework assignment is my own work, except where specifically indicated otherwise. In signing this document I agree that this work may be submitted to an electronic plagiarism test at any time and I will provide a further version of this work in an appropriate format when requested:

Name: ___________ CID: _______ Signature: ___________ Date: __________

Name: ___________ CID: _______ Signature: ___________ Date: __________

Name: ___________ CID: _______ Signature: ___________ Date: __________

Name: ___________ CID: _______ Signature: ___________ Date: __________

Name: ___________ CID: _______ Signature: ___________ Date: __________

Note: Until an assignment carries this completed front page it will not be accepted for marking. If the front page is absent, the delay in getting it added may result in a penalty for late submission.

TO BE COMPLETED BY THE MARKER

Grade awarded: ________________________________

Late penalty applied: ________________________________
22. Appendix F: Map of South Kensington Campus
Building key:

1 Bel tet Quadrangle
Bel tet Hall, Chaplaincy, Imperial College Union
2 Imperial College Union
3 Ethos Sports Centre
Sport Imperial
4 Prince’s Gardens, North Side
No. 8: Early Years Education Centre
No. 10-12: Garden Hall
No 15: Centre for Environmental Policy
5 Woke Hall
6 Blackett Laboratory
Physics, Institute of Solid State Physics
7 Roderic Hill Building
Aeronautics, Biology, Centre for Process Systems Engineering, Chemical Engineering, Composites Centre
8 Bone Building
Aeronautics, Chemical Engineering
9 Royal School of Mines
Earth Science and Engineering, Materials
10 Aston Webb
Earth Science and Engineering
11 Bessemer Building
Centre for Blast Injury Studies, Bioengineering, Imperial Institute of Biomedical Engineering, Institute for Systems and Synthetic Biology
12 Goldsmiths Building
Bioengineering, Materials
13 Huxley Building
Computer, Institute of Solid State Physics, Mathematics, Physics
14 ACE Extension
Aeronautics, Chemical Engineering
15 William Penney Laboratory
London e-Science Centre
16 Electrical Engineering Building
Electrical and Electronic Engineering, Energy Futures Lab
17 Business School
Centre for Quantitative Finance, Innovation Studies Centre, Entrepreneurship Centre, Centre for Health Management
18 S S Prince’s Gate
Business School
19 Eastside
50th Anniversary Building, Eastside bar and restaurant, Essentials convenience store
20 Sherfield Building
Level 1: Catering, Centre for Health Policy, Queen’s Tower, Security Reception
Level 2: Bank (Santander), Fuel Stop, Great Hall, Junior Common Room, Newsagent, QT snack bar, Senior Common Room, Union Shop
Level 3: Academic Visitors’ Accommodation, Centre for Co-Curricular Studies, Conference Office, Equality and Diversity Unit, Finance, Graduate Schools, HR; Pensions, Human Resources, International Office, Outreach, Centre for Continuing Professional Development, Registry; Sport Imperial, Student Accommodation Centre, Student Hub
Level 4: Archives, Continuing Professional Development Unit, ICT, ICT Helpdesk, Occupational Health Service, Safety Department
Level 5: Rhythm Music and Arts Centre, Car Park Service, Communications and Public Affairs, Development, Educational Development Unit, Estates (Projects, Facilities, Finance, Property Management) Read and Poplar Lecture Theaters, Seminar and Learning Centre (SALC)
21 Grantham Institute for Climate Change
22 Faculty Building
Academic Health Science Centre (AHSC), Central Secretariat, Climate-KIC, Communications and Public Affairs, Corporate Partnerships, Faculty of Engineering, Medicine and Natural Sciences, Administration, Finance, Human Resources, Institute for Security Science and Technology, Institute of Global Health Innovation, Planning, President & Rector’s Office, Research Services
23 50 Prince’s Gate
Ballroom, Billiard Room, Boardroom, College Room, Garden Room, Imperial Consultants, Oak Room, UK Energy Research Centre
24 170 Queen’s Gate
Council Room, Dining Room and Solar, President & Rector’s Residence
25 Imperial College London and Science Museum Libraries
Central Library, Library Archives and Special Collections, Science Museum Library
26 Queen’s Tower
27 Skempton Building
Civil and Environmental Engineering, Centre for Environmental Control and Waste Management, Centre for Transport Studies, Wohl Read Out Lab
28 Mechanical Engineering Building
ICT, Mechanical Engineering, Vibration University Technology Centre
29 Southside
Falmouth Keogh Hall, Seckirk Hall, Tirard Hall, Health Centre, Dentist
30 Sir Ernst Chain Building - Wolfson Laboratories
Biology, Cell and Molecular Biology, Centre for Bioinformatics, Electron Microscopy Centre, Glycobiology Training, Molecular Biosciences, Research and Infrastructure Centre, Centre for Structural Biology
31 Flowers Building
Cell and Molecular Biology, Centre for Integrative Systems Biology and Bioinformatics, Chemistry, Electron Microscopy Centre, MIF Centre for Molecular Bacteriology and Infection
32 Chemistry Building
Chemistry
33 Sir Alexander Fleming Building
Medicine, Biology, Biomedical Sciences, Cell and Molecular Biology, Molecular Biosciences
34 Chemistry BCS1
Biochemistry, Biology, Centre for Photomolecular Sciences, Chemistry
35 S2 Prince’ s Gate
Imperial Innovations
36 Alumni Visitor Centre
College Cafe
Student Health & Safety Handbook
Department of Civil & Environmental Engineering
SKEMPTON BUILDING

HEALTH AND SAFETY CONTACT INFORMATION

Emergency procedures:

- **MEDICAL, FIRE or SECURITY EMERGENCIES** - DIAL 4444 or 020 7589 1000
- **FIRST AID** – Contact the nearest First Aider (see separate sheet)
- **BUILDING EVACUATION** – Know your evacuation route, use the nearest staircase (east, west or central stairs). DO NOT USE THE LIFTS. Leave the building quickly and safely. Do not return to collect personal belongings.
- **ACCIDENTS + DANGEROUS OCCURRENCES** – All accidents and near misses, however minor, MUST BE REPORTED using the online system “SALUS”

### Department Emergency Control Team

<table>
<thead>
<tr>
<th>Position</th>
<th>Office</th>
<th>Name</th>
<th>Tel.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Head of Department</strong></td>
<td></td>
<td>Prof N. Buenfeld</td>
<td>45955</td>
</tr>
<tr>
<td><strong>Department Safety Officer</strong></td>
<td>413</td>
<td>Dr G. D. Fowler</td>
<td>45973</td>
</tr>
<tr>
<td><strong>Technical Services Manager</strong></td>
<td>417</td>
<td>Mr B. Whiting</td>
<td>46895</td>
</tr>
<tr>
<td><strong>Department Operations Manager</strong></td>
<td>440A</td>
<td>Mrs L. A. Cumming</td>
<td>42715</td>
</tr>
<tr>
<td><strong>Assistant to the Technical Services Manager</strong></td>
<td>309</td>
<td>Mr S. Hullock</td>
<td>45869</td>
</tr>
</tbody>
</table>

### Building Health and Safety Committee

<table>
<thead>
<tr>
<th>Position</th>
<th>Office</th>
<th>Name</th>
<th>Tel.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chairman of Department Safety Committee</strong></td>
<td>417</td>
<td>Mr B. Whiting</td>
<td>46895</td>
</tr>
<tr>
<td><strong>DSO; EWRE Rep.; COSHH, Radiation, Fieldwork &amp; Biological Safety Advisor</strong></td>
<td>413</td>
<td>Dr G. D. Fowler</td>
<td>45973</td>
</tr>
<tr>
<td><strong>Manual Handling Assessor</strong></td>
<td>236</td>
<td>Mr T. Stickland</td>
<td>43224</td>
</tr>
<tr>
<td><strong>Committee Secretary, DSE Assessor, Fleet Manager</strong></td>
<td>309</td>
<td>Mr S. Hullock</td>
<td>45869</td>
</tr>
<tr>
<td><strong>First Aid Coordinator</strong></td>
<td>507</td>
<td>Dr A. Nievas-Pino</td>
<td>41214</td>
</tr>
<tr>
<td><strong>Fluid Mechanics Section Academic Safety Representative; Laser Safety</strong></td>
<td>328A</td>
<td>Dr H. Burridge</td>
<td>45201</td>
</tr>
<tr>
<td><strong>Geotechnics Section Academic Safety Representative</strong></td>
<td>528B</td>
<td>Dr J. A. H. Carraro</td>
<td>46038</td>
</tr>
<tr>
<td><strong>Structures Section Academic Safety Representative</strong></td>
<td>228B</td>
<td>Dr H. S. Wong</td>
<td>45956</td>
</tr>
<tr>
<td><strong>Transport Section Academic Safety Representative</strong></td>
<td>337</td>
<td>Dr P. Angeloudis</td>
<td>45986</td>
</tr>
<tr>
<td><strong>UG Student representative (Dept. Rep.)</strong></td>
<td></td>
<td>Miss M. Boulleau</td>
<td></td>
</tr>
<tr>
<td><strong>PG Student representative</strong></td>
<td></td>
<td>Vacancy</td>
<td></td>
</tr>
<tr>
<td><strong>Post-Doctoral Research Staff Representative</strong></td>
<td></td>
<td>Vacancy</td>
<td></td>
</tr>
<tr>
<td><strong>Skempton Building Manager (Office in City &amp; Guilds Building)</strong></td>
<td>C&amp;G 260</td>
<td>Mr G. Fairhurst</td>
<td>49639</td>
</tr>
<tr>
<td><strong>Assistant Skempton Building Manager (Office in City &amp; Guilds Building)</strong></td>
<td>C&amp;G 260</td>
<td>Mr Z. Rahman</td>
<td>50186</td>
</tr>
<tr>
<td><strong>Department of Aeronautics DSO (Office in City &amp; Guilds Building)</strong></td>
<td>C&amp;G 222</td>
<td>Dr N. MacCarthy</td>
<td>45043</td>
</tr>
<tr>
<td><strong>Department of Mechanical Eng. DSO (Office in City &amp; Guilds Building)</strong></td>
<td>C&amp;G 329</td>
<td>Mrs J. Easton</td>
<td>51270</td>
</tr>
<tr>
<td><strong>Department of Mechanical Eng. Workshop Manager</strong></td>
<td>238A</td>
<td>Mr A. Wallace</td>
<td>47015</td>
</tr>
<tr>
<td><strong>Wohl Reach Out Laboratory</strong></td>
<td>100</td>
<td>Ms S. Konnur</td>
<td>41924</td>
</tr>
<tr>
<td><strong>Faculty of Engineering Safety Manager (Desk in Faculty Building L2)</strong></td>
<td></td>
<td>Mr S. Greenwood</td>
<td>40821</td>
</tr>
</tbody>
</table>

Imperial College Safety Department (level 4 Sherfield Building)

<table>
<thead>
<tr>
<th>Position</th>
<th></th>
<th>Tel.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Director of Safety Department</strong></td>
<td>Dr S. Johal</td>
<td>49420</td>
</tr>
<tr>
<td><strong>Deputy Director of Safety Department</strong></td>
<td>Dr A. M de Paiva</td>
<td>49421</td>
</tr>
<tr>
<td><strong>Safety Department Administrator</strong></td>
<td>Mrs S. Kerai</td>
<td>49423</td>
</tr>
</tbody>
</table>

Any changes to this list should be notified immediately to Dr G. D. Fowler.

Email: g.fowler@imperial.ac.uk
FIRST AID TRAINED STAFF CONTACT DETAILS

First Aid

In the event of an accident or medical emergency contact the NEAREST first aider without delay!

Your Nearest First Aiders are:

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>David de Ruyter*</td>
<td>010b</td>
<td>45925</td>
</tr>
<tr>
<td>Fionnuala Ni Dhonnabhain*</td>
<td>118</td>
<td>45929</td>
</tr>
<tr>
<td>Paul Jobson* (Mech Eng workshop)</td>
<td>150</td>
<td>47015</td>
</tr>
<tr>
<td>Stefan Algar*</td>
<td>236</td>
<td>45169</td>
</tr>
<tr>
<td>Gordon Herbert*</td>
<td>236</td>
<td>45948</td>
</tr>
<tr>
<td>Rebecca Naessens*</td>
<td>328</td>
<td>45990</td>
</tr>
<tr>
<td>Tina Mikellides*</td>
<td>401</td>
<td>45965</td>
</tr>
<tr>
<td>Dr Angel Nievas-Pino*</td>
<td>507</td>
<td>45970</td>
</tr>
<tr>
<td>Dr James Lawrence</td>
<td>528A</td>
<td>40700</td>
</tr>
<tr>
<td>Dr Antonio Carb Carraro</td>
<td>528B</td>
<td>46038</td>
</tr>
<tr>
<td>Dr Richard Ghail</td>
<td>534</td>
<td>46001</td>
</tr>
</tbody>
</table>

* Denotes Defibrillator trained

Alexandra Williams - Mental Health First Aider 45995/46153
Lucy Chivers - Mental Health First Aider 46098

If you cannot get hold of a local first aider, contact Security: 4444
Out of normal working hours contact Security: 020 7589 1000

<table>
<thead>
<tr>
<th>Nearest First Aid Box</th>
<th>General Office (118)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearest AED</td>
<td>SAF Building - Foyer</td>
</tr>
</tbody>
</table>

This notice was last updated: 09/2017
<table>
<thead>
<tr>
<th>IMPORTANT SAFETY INDUCTION INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evacuation procedure:</td>
</tr>
<tr>
<td>Evacuate the building on sound of the</td>
</tr>
<tr>
<td>claxon sounder and evacuation voice</td>
</tr>
<tr>
<td>and go to the assembly point on the</td>
</tr>
<tr>
<td>steps of the Queen’s Tower</td>
</tr>
<tr>
<td>Campus emergency number</td>
</tr>
<tr>
<td>4444 (from an internal telephone)</td>
</tr>
<tr>
<td>020 7589 1000 (from all other</td>
</tr>
<tr>
<td>telephones)</td>
</tr>
<tr>
<td>Frequency of fire drills</td>
</tr>
<tr>
<td>Annual (usually during the first 4</td>
</tr>
<tr>
<td>weeks of the autumn term)</td>
</tr>
<tr>
<td>Frequency of alarm testing</td>
</tr>
<tr>
<td>Weekly at around 8am on Tuesday</td>
</tr>
<tr>
<td>mornings</td>
</tr>
<tr>
<td>Locations of:</td>
</tr>
<tr>
<td>Fire alarm call points</td>
</tr>
<tr>
<td>Five per floor located between each</td>
</tr>
<tr>
<td>set of fire doors</td>
</tr>
<tr>
<td>Emergency exits</td>
</tr>
<tr>
<td>See map in this book</td>
</tr>
<tr>
<td>Evacuation routes</td>
</tr>
<tr>
<td>Follow the green arrows located on</td>
</tr>
<tr>
<td>the back of all office and lecture</td>
</tr>
<tr>
<td>theatre doors and in the corridors</td>
</tr>
<tr>
<td>Assembly point</td>
</tr>
<tr>
<td>On the steps of the Queen’s Tower</td>
</tr>
<tr>
<td>Fire extinguishers etc</td>
</tr>
<tr>
<td>Located throughout the building,</td>
</tr>
<tr>
<td>at least three sets per floor,</td>
</tr>
<tr>
<td>normally adjacent the emergency exits,</td>
</tr>
<tr>
<td>plus in all laboratories (look for</td>
</tr>
<tr>
<td>the Red location signs)</td>
</tr>
<tr>
<td>Safety Notice Board</td>
</tr>
<tr>
<td>Located on Level 4 on the wall outside</td>
</tr>
<tr>
<td>the room 415</td>
</tr>
<tr>
<td>Departmental Safety staff</td>
</tr>
<tr>
<td>See the list enclosed in this book and</td>
</tr>
<tr>
<td>in the lifts</td>
</tr>
<tr>
<td>First Aid Arrangements</td>
</tr>
<tr>
<td>See the list enclosed in this book and</td>
</tr>
<tr>
<td>in the lifts</td>
</tr>
<tr>
<td>Accident reporting</td>
</tr>
<tr>
<td>Use SALUS – the online reporting</td>
</tr>
<tr>
<td>system. This can be accessed from the</td>
</tr>
<tr>
<td>Safety department web pages on the</td>
</tr>
<tr>
<td>College intranet:</td>
</tr>
<tr>
<td><a href="http://www3.imperial.ac.uk/safety">http://www3.imperial.ac.uk/safety</a></td>
</tr>
<tr>
<td>Safety Department</td>
</tr>
<tr>
<td>Provides advice on Safety issues.</td>
</tr>
<tr>
<td>Located in Sherfield Building, L4.</td>
</tr>
<tr>
<td>Occupational Health</td>
</tr>
<tr>
<td>Provides advice and support (including</td>
</tr>
<tr>
<td>vaccinations and health screening)</td>
</tr>
<tr>
<td>for all College personnel involved in</td>
</tr>
<tr>
<td>College work. Located in Sherfield</td>
</tr>
<tr>
<td>Building, L4.</td>
</tr>
<tr>
<td>Security</td>
</tr>
<tr>
<td>Provides a 24 hour, college-wide</td>
</tr>
<tr>
<td>service relating to building security,</td>
</tr>
<tr>
<td>first aid and emergency support.</td>
</tr>
<tr>
<td>Web site information</td>
</tr>
<tr>
<td>The College intranet contains all</td>
</tr>
<tr>
<td>the detailed information required to</td>
</tr>
<tr>
<td>help staff &amp; students understand</td>
</tr>
<tr>
<td>College policies &amp; procedures.</td>
</tr>
<tr>
<td>Key Web site addresses</td>
</tr>
<tr>
<td>Imperial Home Page:</td>
</tr>
<tr>
<td><a href="http://www3.imperial.ac.uk/">http://www3.imperial.ac.uk/</a></td>
</tr>
<tr>
<td>Use the bookmarks along the top to</td>
</tr>
<tr>
<td>locate the required Departments and</td>
</tr>
<tr>
<td>services. For support services (non-</td>
</tr>
<tr>
<td>academic issues) use the A-Z index</td>
</tr>
<tr>
<td>under “Admin and Service” to locate</td>
</tr>
<tr>
<td>the required area.</td>
</tr>
<tr>
<td>Building Access Hours</td>
</tr>
<tr>
<td>7am-Midnight every day except</td>
</tr>
<tr>
<td>Christmas Day and Boxing Day.</td>
</tr>
<tr>
<td><strong>Normal Working Hours</strong></td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td><strong>Departmental Hazards</strong></td>
</tr>
<tr>
<td><strong>PPE</strong></td>
</tr>
<tr>
<td><strong>Dept. Safety Committee</strong></td>
</tr>
<tr>
<td><strong>General Advice on Safety</strong></td>
</tr>
</tbody>
</table>
Health and Safety instructions for Students

Undertaking taught courses in the Department of Civil & Environmental Engineering, Skempton Building

INTRODUCTION
The Health and Safety of all students whilst studying at Imperial College is a primary concern to the Staff and College. There are several major pieces of legislation that dictate the implementation of Health and Safety Policy and Practise. We must ensure that students are not put at risk during their study at Imperial College. However, there is also a responsibility upon yourself to follow, to the best of your abilities, all instructions and guidance provided. This booklet has been written to provide an outline of Health and Safety arrangements within the Department and to provide you with guidance to your own responsibilities.

GENERAL INFORMATION
Health and Safety within the Department is organised and managed by the Departmental Safety Officer, Dr G. Fowler (room 413, ext. 45973). He is always available to provide advice and guidance on all aspects of Health and Safety. All major Health and Safety decisions are made by the Skempton Building Safety Committee, which meets every term. The committee comprises representatives from all the Sections in the Department, Users of the Building, Student representatives (UG & PG), plus staff with specialist advisory roles for particular activities that may present a risk.

The Orange Health and Safety and Green First Aid/Lifesaver notices provide Health and Safety guidance and list the members of staff with specific safety related duties and responsibilities. Copies of these notices are included inside this book and further copies are spread throughout the Department. These signs are updated regularly. You must yourself familiar with their content.

The College has a significant amount of safety-related information available via its web site: http://www.imperial.ac.uk/safety.

DEPARTMENT SAFETY SHAREPOINT SITE
The Department operates an electronic safety registration and risk assessment system. It is based around an online resource for H+S using the Microsoft SharePoint platform. This system provides a single resource for safety management, including: risk assessment creation and final approval and laboratory safety information. Appendix 1 in this booklet provides a summary of the how you can access the system and complete a risk assessment. As taught students, you will only need to use this system for the research project element of your course where your work include lab or fieldwork activities. Risk assessments will not be needed for desk or computer-based projects. Appropriate training in using this system will be provided when required.
DEPARTMENT SECURITY
Security and safety are closely linked. Please help us keep the building secure and safe by following the following simple rules:

**ALWAYS** wear your College Security/ID card whilst at College. Belt clips or neck lanyards are available from the department General Office.

**DO NOT** allow strangers to enter the building out of hours (deliberately or via tailgating).

**NEVER** lend your ID card to anybody, if they cause damage or present a risk to security or safety, **YOU** will be liable.

DEPARTMENTAL WORKING HOURS
The nature of the College is such that it appears to operate 24 hours per day - research never stops. Nevertheless, there are times of the day which the College considers are “outside normal hours” or access is limited and so special safety procedures including specific risk assessments and or lone working approval may be needed for your work to continue. In addition, there are times of the day when the College is “closed”. The Department open and closed hours are as follows:

- **Normal opening hours:** 8am – 6pm Monday to Friday
- **Swipe card access only:** 7am – 8am and 7pm – 12pm, Weekdays
  - 7am- 12pm Weekends and Public Holidays
- **College “Closed” (swipe inactive):** 12pm to 7am every day and during selected days during College Closure at Christmas and Easter

Please make sure that you leave the Department before midnight. College Security patrol the buildings out of hours and any persons found on the premises will be removed from the building and have their access rights curtailed.

SAFE BEHAVIOUR IN THE DEPARTMENT
This is a large and busy building where many varied and potentially dangerous processes occur. You should always be careful when in the building, to ensure that you do not put your self or others in way of harm. For example, be aware of people around you when walking down corridors, so that you do not obstruct them or inadvertently release a door into their path. All doors on the corridors are fire doors and have automatic closer devices fitted which cause the door to swing back, almost instantaneously, to the closed position. Please note that some of these doors (mainly on Level 5) have a delayed close and should not be forced to close – this will damage the closer device. Fire doors **must never** be propped open with a wedge or other heavy object.
Also, please note:

- Do not run in the corridors.
- The wearing and use of roller blades, inline skates and the use of scooters in the building is forbidden. They are a hazard to other people and damage the floors.
- You must not enter any of the laboratories or workshops without prior permission.
- Bicycles are **not allowed** in the building – this is a College-wide policy. Bicycles must be stored in the racks provided on Campus.

**WASTE DISPOSAL**

There are very strict laws governing waste disposal. The College is proactive with regard to waste management and recycling, there are numerous recycling points around the building. Certain wastes generated in the department are separated for recycling/safety reasons. The following is a brief guide to the recycling and waste disposal mechanisms operating throughout the campus and applied within the department.

The College is striving to recycle as much of the waste it generates. One way to achieve this is by segregating waste at source. To achieve this the College has a number of different waste bins in use, which are colour-coded, each one designated for different wastes:

- **Waste domestic Glass (not broken glass):** Use the red-topped bins
- **Paper and Card (no paper cups or food wrappers):** Use the blue-topped bins
- **Cans and plastic bottles:** Use the green-topped bins
- **Non-recyclable waste:** Use the black-topped bins

Special arrangements exist for non-domestic, electronic and laboratory wastes:
Batteries: A dedicated bin for batteries is located on level 2 (BOSS area) in the area near the photocopiers.

Chemical wastes: Any waste arising from laboratory activity which is contaminated or classified as hazardous (laboratory staff will advise you if you are unsure) must be disposed of in a controlled manner. Each Laboratory has special containers for segregating these wastes, including solvents, flammable waste, oils, corrosive materials, powders, etc. Please follow the guidance in each laboratory appropriate for the waste requiring disposal.

Clinical waste: Of main concern are syringe needles and any bodily fluids. If you find anything which may fall into this category around the department, please contact the Department Safety Officer (DSO) immediately.

Electrical equipment: Waste electrical equipment must not be disposed of via the non-recyclable waste route. Please contact the DSO for details of the procedures which exist for disposing of these materials.

Laboratory waste: Every laboratory has rules regarding the disposal of laboratory waste. You will be advised by laboratory staff what is expected in each laboratory.

Laboratory Glass: The College operates special disposal systems for laboratory glassware which is contaminated or made from Pyrex – it MUST NOT be put into the red recycling bins in communal areas.

Toner cartridges: There is a bin on L2 (BOSS area) and L4 outside room 415, dedicated to printer and toner cartridges.

If you have any doubts regarding the best way to dispose of a laboratory waste, ask the Laboratory staff, your Supervisor or the Department Safety Officer. Your risk assessment should specify all waste disposal procedures required for your work.
FIRE EQUIPMENT AND ESCAPE ROUTES

The Department has several means of escape in an emergency. The plan below shows the building in relation to the rest of Imperial College.

Emergency exit locations and Assembly point for Skempton Building

![Image of emergency exit locations and assembly point]

**THERE ARE FOUR PRIMARY EXIT ROUTES FROM THE BUILDING**

- The East Stairs adjacent Mechanical Engineering/Unwin Road
- The West Stairs which are part of Electrical Engineering
- The Main (Central) Stairs beside the lifts, through reception
- Through the BOSS area on Level 2 into the City and Guilds Building

The emergency evacuation assembly point is the stepped area around the base of the Queens Tower.

All the corridors in the building must be kept clear. Do not put chairs or tables into corridors, as they reduce the width and cause an obstruction. Similarly, because all the doors in the Department corridors are fire doors, they must NEVER be propped open with wedges, fire extinguishers or by any other means.

You MUST know which way is the quickest emergency escape route from your location in the building. All the emergency escape routes are indicated with an “arrow and running directional figure” green sign. The evacuation alarm is a Claxon sounder with voice instructions. If this activates you must stop what you are doing and leave the building IMMEDIATELY by the nearest emergency escape route in an orderly manner, making sure that you close any doors behind you.

There are evacuation notices in every room in the building (please see the following page for an example) indicating with a green arrow the preferred exit route from that part of the building. Please follow these arrows as they will ensure that you can evacuate from the
building with the minimum of delay. Please try to avoid using the main staircase during an emergency evacuation. The congestion on the main staircase can be significant and your evacuation will be much delayed.

Direction of the nearest escape route

Emergency

For all Emergencies dial 4444

The assembly point is adjacent the base of the Queens Tower

For further details see the Department Safety notices
There will be a fire drill during the first term, to familiarise you with emergency procedures.

FIRE PREVENTION & SAFETY
The consequences of a fire in any building can be several fold. Apart from the unacceptable loss of life which may result, there are the lesser consequences of damage to the building, the cessation of activities in the damaged area (or the whole building) and the loss of research and data in an Academic building. None of these outcomes are acceptable.

There is a responsibility upon all users of the building to ensure that fire prevention is a core part of all risk assessments and our day-to-day activities. The College has suffered several fires in recent years. The most serious occurred in the Department of Chemical Engineering and resulted in three laboratories being destroyed. The consequence of the lost research, equipment and data was very costly to the students and staff concerned, irrespective of the fiscal implication for the College and Department.

Current UK Fire Brigade policy is to not place fire fighters at risk, if there are no members of the public (College personnel) in the burning building. Thus, they could allow the building to be destroyed.

There have been several fire incidents in the Skempton Building, mostly caused by faulty electrical equipment. Most recently there was an incident involving the communal Microwave Ovens. When using the microwave ovens, the instructions on the ovens must be followed.

Failure to use the ovens responsibly and safely may result in them being removed.

IF THE FIRE EVACUATION ALERT SOUNDS, DO NOT:
- Wait or return to collect any belongings
- Leave the assembly point until instructed to do so
- Return to the building until the all-clear is given

MICROWAVE OVEN SAFE USAGE
- Follow the instructions on the front of the microwave oven
- Never microwave loose food – always place it in a container
- Only use “microwave oven safe” containers
- Do not use metallic containers or utensils in the microwave
- Loosen/open the lid on the container
- Do not leave food cooking unattended
- If food spills in the microwave, please clean it up.
- Report any problems with the microwave to the Technical Services Manager (b.whiting@ic.ac.uk)
ACCIDENTS AND DANGEROUS OCCURRENCES
The College has a policy that ALL accidents or dangerous occurrences, however small, MUST be reported. This is because there is a very strict law with regard to reporting accidents to the authorities. There is an online system “SALUS” available for reporting all accidents or dangerous occurrences. A dangerous occurrence is an incident that does not result in personal injury.

SALUS is accessible from the Safety department web page via a quick link: http://www.imperial.ac.uk/safety

Typical accidents in the Department tend to occur due to “slips, trips, falls” and poor lifting practice. Many of the corridors in the Department are linoleum or terrazzo. When wet, the floors are slippery. If you see a wet floor, or cause a floor to become wet, for example by spilling coffee or tea, please do not walk away, clear it up with paper towels (these are available from the General Office).

FIRST AID & LIFESAVERS
The College has a very well organised First Aid system. There are several qualified First Aiders working within the building. The offices of these staff are identified by the Universal first aid sign (a Green & White cross). If you feel unwell or need First Aid assistance please contact any of the staff identified on the list in the front of this book for assistance. In addition, most of the College Security staff are trained in First Aid and can be contacted by calling the College emergency number 4444 or 020 7589 1000. There are supplies of sticking-plasters and bandages available to treat minor injuries (cuts, scrapes and bumps). Any injuries which cannot be readily treated by a First-Aider must be looked at by the Health Centre, who may decide that hospital treatment is necessary.

ELECTRICAL EQUIPMENT
The Department has a very strict policy regarding mains-powered portable and desk-based electrical equipment brought onto the premises. This is detailed below. The key aspect of this policy requires that any electrical equipment in the building must be either new or safety tested prior to use. The periodic testing of electrical equipment in the Department is undertaken by external contractors. Thus, unless your electrical equipment meets any of the conditions below, you are NOT PERMITTED to plug it into the department electrical 240V sockets.

All equipment which has been tested and passed the electrical safety test will have attached a green sticker indicating that it may be used in the department (see image following). Any equipment not displaying this sticker or meeting the exceptions criteria described below the image, will be confiscated.
New equipment brought into the Department
New equipment brought into the Department may be used for the first year without the need for a Portable Appliance Test (PAT). The user is asked to perform a simple visual check on all equipment prior to use. Records of the equipment purchase, usually through the College finance system or a receipt from the supplier, must be kept to be able to prove the date of purchase. It must also be marked with a European CE mark or an otherwise equivalent international directive.

Personal electrical equipment brought into the Department
Personal electrical equipment brought into the Department will be PAT tested as Departmental equipment. To ensure that personal electrical equipment is tested within an acceptable timeframe (limit of one year of safe usage), only new personal equipment may be brought into the Department. Proof of date of purchase will be required. Under no circumstances may old equipment be brought into the Department. If old equipment is found then it will be confiscated and may be destroyed. The exception to the above is personal mains chargers for devices such as laptops, tablets and phones, etc. for which there is no age restriction.

Unauthorised electrical equipment
The list below gives some examples of unauthorised electrical equipment which must not be brought into the Department:

- Electric fires and heaters of any form
- Any form of equipment used for cooking or warming food (kettles, toasters etc.)
- International equipment which is not compatible with the UK mains voltage (220-240V)
• International equipment which is not marked with either the European CE mark or an equivalent international standard.

**Electrical equipment belonging to visitors**
Electrical equipment belonging to visitors and brought into the Department will be subjected to the normal Departmental rules.

**Electrical equipment belonging to third parties**
Electrical equipment belonging to third parties, such as contractors working within the Department, are the responsibility of the third party who will be required to demonstrate that their policies and procedure are at least in accordance with and of a standard compatible to those of the Department.

**Design, construction, checking and testing of electrical equipment**
Those involved in the design and construction of electrical equipment will be required to ensure that such equipment is suitably tested to ensure that it performs within the general conditions of the Departments “Electrical Equipment – Policy and Code of Practice”.

**Repair, installation or modification of electrical equipment**
Unless otherwise directed, staff and students in the Department are not allowed to undertake any repair, installation or modification to electrical equipment.

**Disposal of electrical and electronic equipment**
Consult the Facilities Management web pages to arrange for the collection and disposal of unwanted College Equipment (there may be a charge for this service).

http://www.imperial.ac.uk/estates-facilities/buildings/services/waste-disposal/waste-disposal-forms/weee-forms/

**LABORATORY COURSES**
There may be several occasions when you will undertake laboratory work as part of your course. The Department is very unusual within the College in that it operates all major classes of laboratories with many diverse activities, which include the traditional mechanical and engineering testing through to specialised chemical and biological work. Each laboratory has their own specific safety procedures which will be explained in detail before any work commences, you MUST abide by the following general rules for any laboratory behaviour/work.
Work in any laboratory must only be conducted during normal College hours (9am-6pm), with at least one other person in sight at all times. Lone laboratory working is \textbf{NEVER PERMITTED}. Additionally, the other person in the laboratory \textbf{must know the College emergency procedures and be familiar with the working environment} so that if they need to isolate a service or make safe an experiment in an emergency, they know what to do.

\textbf{RISK ASSESSMENTS}

Risk assessment is the cornerstone of Health and Safety management. No activity should be started before a risk assessment has been completed. To be able to perform a risk assessment you need to know what you are going to do and have an understanding of the steps and processes required in the task being assessed. If all the information is at hand, the assessment should be a straightforward task. If the risks are considered to be too high, this does not mean that the activity cannot be completed but it may mean that a different approach or better control measures are required to reduce the potential risks.

For most laboratory classes, the assessment will have been undertaken by the course or laboratory organiser. They will explain the assessment to you and indicate the main risks from the work to be conducted and advise you how to avoid these risks. However, some laboratory or fieldwork classes will require you to complete your own assessment (particularly for project work). The Department has standard online forms for this purpose, accessed via the SharePoint site mentioned earlier. Guidance on the completion of these forms will be provided in special introductory sessions prior to you undertaking the projects requiring assessments.

When completing risk assessments, if you need further information or require advice, you must ask the staff supporting your work (Academic or Technical). If they cannot provide the necessary answer or information, please do not hesitate to ask the DSO.

<table>
<thead>
<tr>
<th>Laboratory “Do and Do not”</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DO</strong></td>
</tr>
<tr>
<td>• Follow all instructions from the demonstrators/lab staff</td>
</tr>
<tr>
<td>• Wear all necessary personal protective equipment, especially your safety glasses, at all times in all laboratories</td>
</tr>
<tr>
<td>• Tie back long hair</td>
</tr>
<tr>
<td>• Wear appropriate clothing and stout shoes or safety boots, as required.</td>
</tr>
<tr>
<td><strong>DO NOT</strong></td>
</tr>
<tr>
<td>• Wear long/dangly clothing or jewellery which may become snagged in moving machinery</td>
</tr>
<tr>
<td>• Wear sandals or open-toed shoes</td>
</tr>
<tr>
<td>• Run or fool about in the laboratories</td>
</tr>
<tr>
<td>• Eat or drink in ANY laboratory</td>
</tr>
</tbody>
</table>
FIELD COURSES

During the time of your studies within the Department of Civil and Environmental Engineering, there are several major courses of varying duration that require you leave the Department and College premises. Whilst away from these premises your Health and Safety is still our responsibility. We take this responsibility very seriously. The College is covered for most events by its insurance, but there is an important onus (and a legal responsibility) upon you to abide by College Health and Safety rules. Every field course has its own specific set of instructions which detail the risks and methods for minimising these. Copies of these instructions will be given to you prior to your undertaking of the course. The following information is meant as a general benchmark for you to use and apply at all times when away for course purposes.

When we organise any field course, the course co-ordinator carefully considers all the potential risks that may occur and are attributable to the particular situation. For example a visit to a quarry has particular dangers which are different to a visit to a bridge or road, but there are several common risks which can be controlled and minimised if not entirely eliminated by applying several basic rules.

1. Whilst on any field course, the most important rule is that you MUST follow the instructions of the course leader. Pay particular attention to guidance on safe practices whilst on that trip.
2. Do not try to take too much luggage with you, heavy bags can be difficult to carry and cause back strain, as well as being a potential danger if they fall from luggage racks in buses.
3. Ensure that you are suitably dressed for the trip or course i.e.: a hard hat, warm and waterproof clothing and stout shoes would be a minimum requirement for a winter visit to a site – forget fashion!
4. Take particular care when crossing roads checking in both directions for traffic before crossing. When walking alongside roads not designed for pedestrians try to stay at least 1m from the traffic at all times.
5. Make sure that you inform the course leader of any medication which you use or any ailment which you suffer from that may be a problem during the course. For example if you are a diabetic or have food allergies, it is vital that the course leader of a residential trip is aware of this in advance for dietary purposes or in case you require medical assistance on the course. Ensure that you are carrying sufficient medication for the duration of your course. A less obvious condition, but equally dangerous would be if you suffer from vertigo and visits to a bridge or tall building may be a problem or conversely, claustrophobia would be an issue for a visit to sewers.
6. Be aware of problems like dehydration and sunburn which may occur on summer field trips.
7. Any accident or dangerous occurrence, however minor, must be reported immediately to the course leader.
8. The evenings of residential courses may seem like a ideal opportunity to relax and have fun, but alcohol abuse can be dangerous and antisocial behaviour resulting from this will NOT BE tolerated.
9. You are representing Imperial College whilst on the course. Any public nuisance or criminal prosecution resulting from disreputable behaviour whilst on the course will be your liability and not the College’s. For example, some sites are classified as SSI’s (Special Scientific Interest), damaging them by even walking across them can result in prosecution.
10. Visits to sewers, building sites or other outdoor environments may expose you to pathogens such as Tetanus or Leptospirosis (Weil's Disease). It is recommended that your tetanus jab is kept up to date. It is usually valid for 10 years. The course leader or coordinator must provide you with course details and risk assessments before commencing the field work activity. If you do not receive this information, ask the coordinator for it. **MEng Students must take the supplied PPE on all the field courses.** Failure to do this will result in you being refused participation in the course which may mean you fail that element and hence the year.

**Visits Abroad**

Trips outside the UK are a feature of some of the courses. However, depending on the reason for your trip abroad, the College’s insurance may not provide full cover in all eventualities (i.e. terrorism and war zones). There may be particular risks which must be considered alongside the normal risks discussed above.

The most obvious hazards are from disease, both insect and water-borne, which will generally be regional specific i.e. tropical climates – Malaria, so advice on the required vaccinations will be needed. The availability of clean drinking water cannot be overlooked.

There may also be hazards due to wildlife, for example, predators such as large cats, venomous creatures (snakes, spiders, fish etc.), sharks, polar bears and so forth.

Despite the growth of global communications, some parts of the world do not have very comprehensive satellite or mobile phone coverage, so communications with other part of the country or globe may be limited. In addition, battery life on mobile telephones must be carefully managed as you cannot guarantee to be able to find a suitable electrical supply to boost your telephone’s charge.

A further factor to consider is the political stability of the country you will be visiting. The risk of kidnap is a real threat in some countries. It is advisable to register with your national Embassy when you arrive in a foreign country, so that they know you are there. There are some countries around the world where organised society has broken down or is badly eroded due to Civil war or natural disasters. There must be very compelling reasons to travel to countries with these particular problems and comprehensive risk assessments will be required. In addition, approval for trip to countries which fall into this category will need to be given by the Head of Department. Your supervisor or course leader should make all the necessary arrangements to cover your trip. This includes activating the College insurance, which is a comprehensive policy. Nevertheless, it is very important to recognise that **no travel insurance** is truly and fully comprehensive. There are limits to what an insurance company can do to recover you from danger or protect you from harm. [International Rescue ("Thunderbirds") do not exist].

There are several sources of information relevant to trips abroad:

The UK Foreign and Commonwealth Office web pages contain all the information to help make your trips as safe and enjoyable as possible: [http://www.fco.gov.uk/](http://www.fco.gov.uk/). Follow the links for “travel advice”.

If you need to undertake international trips for projects etc., please plan ahead. Discuss the project needs with your supervisors and the DSO, as required and submit the risk assessment form at least three weeks before you intend to travel.

College Occupational Health will provide advice on travel medication, injections etc., and will also undertake immunisation injections for College-required trips. However, you must arrange these well in advance of your trip (ideally, at least one month before travel).

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment, (PPE) is an essential part of Civil Engineering site safety. In recognition of this PPE is an essential requirement for the field courses run by the department.

All first year undergraduate (MEng) students will be issued with a personal safety pack after Christmas, just prior to the commencement of their first fieldtrip. This safety equipment must kept safe and looked after because the items will be needed throughout the four year MEng degree. If you lose any items you will be charged for replacements. If you do not bring them to your course when required, you will not be permitted to undertake the module and may fail the course as a result.

The safety pack will comprise the following items:

- Hard Hat
- Safety Glasses
- Site Gloves
- High-Vis Vest

Hard Hat

British Standard Hard Hats must be thrown away after four years, as their safety performance cannot be guaranteed after this time. MSc students will be issued with hard hats during field courses and other times as required, but these must be returned to the Department. The Department issues Hard Hats as part of the safety pack above for all undergraduate students in the Department. The Hats will be needed for most field courses over the 4 year course and must be looked after.

Safety Glasses

MSc students will be issued with safety glasses as required for laboratory and field courses. These are issued as part of the safety pack to the undergraduate students. Safety Glasses are required for all laboratory courses and most field courses. If you do not have a pair of safety glasses, you will be unable undertake the course.
Gloves
Increasing concerns over dermatitis (from cement) and cuts and grazes from construction site activity has seen the compulsory wearing of gloves on all construction sites. A pair of cotton gloves suitable for site are included in the safety pack issued to the undergraduate students and these are needed for all site visits. MSc Students will be issued with a suitable type of glove for laboratory and fieldwork courses.

High-Vis Vests
Site visibility is a key part of safety management, hence all site visits require the wearing of high-vis vests or jackets. A high-vis jacket forms part of the Safety Pack, for UG students, whilst MSc students will be issued with them as required.

Safety Boots
All undergraduates and some MSc students (Check your course information) must own a pair of safety boots. The footwear needs to be classified as complying with EN ISO 20345, which provides the highest level of impact resistance in the toe area and be fitted with a steel mid-sole with steel toe caps and offer ankle support.

Not only are safety boots essential for any visits to construction sites, but some laboratories within the Department require that they be worn at all times and they are needed for the Surveying, Geology and Constructionarium field trips during the first and second years of the MEng degree respectively.

The Department will be arranging for a specialist supplier to attend the Skempton Building during the first week of term to sell these boots (check your course information for more details). The wearing of safety boots is compulsory during certain courses and failure to abide by this rule will result in you being barred from the course and possibly failing that module (and hence the year). Safety boots can be readily purchased from many high-street suppliers, but these must meet the minimum requirement described above.

Some MSc courses will issue the safety equipment as the class need arises, but this must be returned to the Department at the end of the class.

WEB RESOURCES FOR HEALTH AND SAFETY AT THE COLLEGE

The College Intranet, which is accessible for all College networked PC’s, has comprehensive health and safety information covering most aspects of the activities undertaken by the College. This information can be readily accessed from either the Safety Department or the Occupational Health web pages, which can be reached under the “A-Z” tab (admin and Services) on the right-hand side of the College main menu bar of the Home Page.

Some of this information is protected and you will need your College username and system password to view all the information contained within. You can access SALUS for reporting accidents and dangerous occurrences (as described above) from this site, plus view the College policy on health and safety and guidance on many aspects of safety.
COMPUTER USE
The Department is particularly well equipped with open access computing laboratories on levels 2 and 3 that are used for teaching as well as research purposes. However, it is becoming increasingly common for people who use computers or “display screen equipment” (DSE) for long hours to start to suffer from eye and skeletal/musculature problems, particularly if you use a laptop rather than a “fixed” desk computer. This may result in eye strain, back, neck and shoulder pain, problems with wrist and arm joints. The College has produced detailed guidance on ways of minimising/eliminating potential problems from DSE use. A copy of this information sheet is appended to this booklet. Please read and apply this information, it may save you much discomfort later in life.

If you undertake a project which involves long hours of computer use then you should follow the guidance below and undertake a DSE assessment of the workstation you are using. The “Computer Health & Safety Checklist” (DSE assessment) form is available to download from the following link:

http://www3.imperial.ac.uk/OCCHEALTH/formsandchecklists

Computer Use – Healthy Working
All members of the college community use computers to a greater or lesser extent. You should undertake a simple DSE assessment of the workstation you are using.

It is becoming increasingly common for people who use computers or “display screen equipment” (DSE) for long hours to start to suffer from eye and skeletal/musculature problems, particularly if you use a laptop rather than a “fixed” desk computer. This may result in eye strain, back, neck and shoulder pain, problems with wrist and arm joints. This is called “Cumulative Trauma Disorder”. The set-up of your computer workstation is very important. A poor set-up may cause the above health issues. If you start to suffer from any of the above symptoms from using computers, you must contact the departmental Display Screen Assessor (Dr Fowler) for any questions or concerns you have with regard to healthy computer usage.

The following guidance will help you in minimising the likelihood of the symptoms developing indicative of Cumulative Trauma Disorder.

Staying Healthy With Your Computer

Avoiding Cumulative Trauma Disorder
Computers can damage your health. Every year we see several cases of Cumulative Trauma Disorder (CTD) formerly called RSI or Repetition Strain Injury in staff and students and the problem is becoming more common. Avoid it happening to you by taking care to organise your work-station and organise your time spent using a computer both at work and at home.

Follow these simple rules and find that your computer can work for you without causing harm.
Take Breaks - The Key Issues
1. Intersperse with other work (take note laptop users!): phone calls, writing/reading work, filing, proof reading, photocopying, talking with colleagues. Even coffee breaks!
2. Five minute break every hour and don’t spend a whole day on computer-based activities (applies equally to work at home). Web surfing, updating Facebook, Blogging or online gaming do not count as a break!

Keep Your Desk Tidy
Avoid cluttering it up with books, papers etc. Make sure you have enough clear space to operate your mouse easily and to access your keyboard. Keep most frequently used items close to hand to avoid stretching.

Adjust Your Computing Equipment to Suit You
1. Set your screen to a comfortable height, usually with the top just below eye level, so you do not have to stretch your neck. Avoiding any twist in your spine, sit face-on to your screen.
2. Ensure sufficient room to rest your hands in front of keyboard when not keying. Interchange position of keyboard and mouse depending on data input device predominantly in use at the time.
3. Adjust your seat height so your arms are horizontal to the keyboard and avoid flexing/extending wrists. If you use a laptop, work with it on a table, never on your lap.
4. Ensure room for your feet to rest under your desk. A footrest may be beneficial for small people.

Get Comfortable

| Make use of the illustrations below to see whether you’ve organised your desk and your work to avoid unnecessary problems. The rules for desktop users apply to work with laptops; whenever possible the same advice should be followed. |

Don’t ruin your work by poor practice. Be organised, be sensible with your work-time & be successful— without damaging your health.
1. Adjust the seat height and back tilt/height to fit you. Twisted or cramped posture to be avoided.
2. If you are copying documents, use a document holder.
3. Sit back when you are thinking, rather than staying hunched over your screen.
4. Use a soft touch when keying and avoid flexing your wrists. Try to adopt a neutral position. If possible, learn how to use short cut keys and touch typing.
5. Give your eyes a comfort break too. Look away from your screen or close your eyes when thinking. Avoid staring at the screen and throw in a few extra blinks as natural blink reflexes are often unconsciously suppressed.

DON'T IGNORE SYMPTOMS
If your arms or shoulders start aching/tingling, follow steps below.

1. Take a break and re-organise work to give yourself more breaks in future.
2. If symptoms persist or keep recurring, contact your occupational health (OH) service for help.

Make Use of the Experts
1. All College departments should have a DSE (Display Screen Equipment) Assessor who knows about computer ergonomics and can help you check your workstation. They’ll help you with the computer checklist if you don’t feel confident to complete it yourself. Also if you identify problems through the checklist which you can’t solve yourself or which may affect your or other’s safety.
2. Your local OH service can assess and advise on CTD problems.
3. Students can arrange vision screening with the OH service.

**Personal Safety for Laptop Users**

1. Do not endanger your health by carrying too heavy a total load with the addition of your laptop.
2. Take precautions to avoid theft while your laptop is in transit and check your insurance cover. Your personal safety is more important than loss of your laptop.

Dr G. D. Fowler
Departmental Safety Officer
August 2017
Appendix 1: A quick guide to using the Department SharePoint Safety Site

An Introduction to using the SharePoint Site

Dr Geoff Fowler
Departmental Safety Officer
Risk Assessments

- All research activities undertaken in the College MUST have a risk assessment.
- Risk assessments MUST be done BEFORE the work starts.
- All the necessary forms and processes are available via a SharePoint system.
- Academic Supervisors must approve the assessment and electronically sign it off.
- Secondary Checker also approves (Lab manager or DSO)

The SharePoint Site

- An automated system to enable the creation of risk assessments and manage their approval and archiving

- Accessible from any Networked PC or VPN connection – use College ID and Logon

- Works with most internet browsers. It does not work in Linux
The SharePoint site allows you to attach extra information linked to your General Risk Assessment:

- COSHH Assessment
- Computer use (DSE)
- Fieldwork Risk Assessment
- These separate Word forms are all on Blackboard & SharePoint for download

Risk Assessment – A Step-by-Step guide

- Log onto SharePoint:
  https://imperiallondon.sharepoint.com/sites/foe/CivilEng/HealthandSafety/default.aspx
  - The Microsoft SharePoint logon page may open first, asking for your College username ("USERNAME@ic.ac.uk"). Enter your details and then you will be transferred to the Imperial College SharePoint logon page. Enter your College Password and then:
  - The Department H&S SharePoint site will open

*Use Explorer v10, Firefox or Chrome. It *does not* work in Linux or Explorer v11*
Logging on to SharePoint – Initial 365 sign in

Enter your College username. Use “@ic.ac.uk” as the address identifier. The site will automatically forward you to the Imperial College SharePoint Office 365 (cloud-based) main login page.

Logging into SharePoint – Imperial 365 site

Enter your College password. Then click the "sign in" button. The department Health and Safety site should open.
Department SharePoint Site

Using the Site

• 1st step: Complete a General Risk assessment:
  - This covers many activities, but occasionally you will need to use special forms for certain tasks (COSHH, Fieldwork, Biological work)
  - You need to identify all the risks and quantify them
  - Attach extra information including Engineering/experimental designs, SOPs etc.

• 2nd Step: submit your form(s) for approval:
  - Approvers may include: Your Supervisor, the Laboratory Manager, A qualified 2nd engineering academic (for Structures), the HoD (for hazardous fieldwork) & the DSO.

• 3rd Step: Forms are assessed and approved (or rejected) by your Supervisor & Lab Manager
SharePoint General Risk Assessment
How to complete the form (1)
Starting the form & selecting the assessors

- Enter all requested information.
- Blank spaces or unanswered questions will prevent the form from being submitted for approval.

- Enter the title of the project and put your initials (in brackets) at the end to create a unique file reference. This entry becomes the file name.
- Provide a brief description of the planned work. Enough detail for the reviewers to know what the project is about, but do not provide details on methods or risks.
- Attach method files, COSHH assessment etc. & complete the risk matrix below.

SharePoint General Risk Assessment
How to complete the form (2)
Lone Working & Hazard identification

- Lone working is a significant issue of concern for the College. This section must be completed accurately & honestly.
- Use these options to help identify hazards. Ticking a box opens a guidance section with links to specific specialist risk assessment forms. The specialist forms (COSHH, fieldwork etc.) must be completed too and attached to this form for submission and approval as part of this risk assessment process.

Complete all the sections. Any unanswered parts will prevent submission of the form.
Read the guidance & advice to understand what is needed here.
SharePoint General Risk Assessment
How to complete the form (3)
Risk assessment

Raw risk:
Probability is always 4
Severity is selectable (1-4)
Use the help box to understand what severity and probability mean and the difference between each numerical value (1-4).
Identify each hazard on a separate line (lines can be added using the “insert another hazard box”)
Attach all supporting documents here. These can include: COSHH forms, Fieldwork Forms, method descriptions, Bio1 approval forms, experiment design notes and other supporting documents.

Residual risk: Probability should have reduced Severity is unlikely to change
Do not leave an empty line in this table – it will prevent the form from being submitted

SharePoint General Risk Assessment
How to complete the form (4).
Completion and Submission

Answer all these questions. Use the risk analysis outputs to ensure that you do not overlook any required measures.

Select a review period longer than the planned length of the project. If the assessment is for a 3 month MSc project, pick at least 6 months as the review period etc.

You do not need to complete the form in a “single sitting.” You can save the form at any time and return to it later.

Additional Safety Control Measures

Emergency Procedures

Review of the Risk Assessment

This box will remain unavailable until you have completed all the required sections/boxes.

Once you have completed the form and are happy with the content, you should submit it and await the assessors’ opinion. Hopefully, they will approve it. If they do not, you should receive feedback on the rejection email stating what improvements are required. You will need to make the changes and resubmit the form.

You CANNOT start work until the form has been approved.
The SharePoint site allows you to attach extra information linked to your General Risk Assessment:

- **COSHH Assessment (Dept specific form)**
  - Legally required for any work involving harmful substances: Acids, glues, gases, solder, flux, dyes, etc.

- **BIO1 form**
  - College requirement for any work involving biological agents. Any Biological work MUST be discussed with the DSO before you do any preparation work.

- **Fieldwork Risk Assessment (FW1)**

- Each of these forms are separate WORD documents available through SharePoint

5 Steps for undertaking a risk assessment

- **Step 1:** Identify the hazards
- **Step 2:** Decide who might be harmed and how
- **Step 3:** Evaluate the risks and decide on precautions
- **Step 4:** Record your findings and implement them
- **Step 5:** Review your assessment and update if necessary
Hazard & Risk Defined

- **HAZARD**: anything that may cause harm, such as chemicals, electricity, working from ladders, an open drawer etc;

- **RISK**: the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.

Lone Working

- There must be at least one other person in a laboratory with you outside of normal hours.

- That person **must know** what to do in an emergency (A “BUDDY”).
  - How to stop the experiment
  - Emergency procedures
  - Who to call

- The best way to avoid lone working concerns is to **plan your work**
Research Specific Training

- It is **essential** that you know how to perform your research competently and safely.
- You are **forbidden** to use any item of Laboratory equipment or undertake a procedure until you have been appropriately trained.
- If you have any doubts or concerns about the equipment or methods, even after training, then you must ask for more instruction.
- Failure to do this may result in harm to you, your colleagues and/or the equipment.
- This may result in prosecution of the College, your Supervisor and you.

FINALLY...

- If in doubt about any safety issue, ALWAYS ask somebody:
  1. Your Supervisor
  2. Laboratory Staff
  3. Department Safety Officer
If you have any questions about using the SharePoint Site, need assistance to complete a risk assessment or have any other safety-related questions, please contact the department Safety Officer:

Dr Geoff Fowler
Room 413
g.fowler@ic.ac.uk
CI9-FM-01 Fluid Mechanics Fundamentals

<table>
<thead>
<tr>
<th>Course leader:</th>
<th>Dr Marios Christou</th>
</tr>
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<tbody>
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<td>Other contributors:</td>
<td>Professor Graham Hughes</td>
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<tr>
<td>Assessment:</td>
<td>Coursework and written examination</td>
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1.0 Aims
- Equip students with the fundamentals of Fluid Mechanics.
- Create a solid foundation on which to build on with subsequent modules.

2.0 Syllabus
- Fluid properties and fluid statics.
- Control volumes, mass, volume, momentum and energy conservation and general conservation laws.
- Steady and unsteady flow.
- Eulerian versus Lagrangian descriptions.
- Path lines, stream lines and streak lines.
- Real fluids: Newton’s law of viscosity.
- Euler and Navier-Stokes equations.
- Laminar and turbulent flows.
- Scaling and similarity.
- Boundary layer.
- Introduction to turbulence.

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<th>Staff</th>
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<td>03</td>
<td>Steady and unstead flow</td>
<td>MC</td>
</tr>
<tr>
<td>04</td>
<td>Eulerian and Lagrangian descriptions</td>
<td>MC</td>
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<td>05</td>
<td>Path, stream and streak lines</td>
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<td>07</td>
<td>Euler and Navier-Stokes equations</td>
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<td>08</td>
<td>Laminar and turbulent flows</td>
<td>GH</td>
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</table>
3.0  Intended learning outcomes

On successfully completing this module, students will be able to:

- Understand the fundamental physics of fluid flows.
- Appreciate a wide range of fluid properties and behaviours.
- Build upon a solid foundation in fluid mechanics.

4.0  Teaching methods

The module will be taught using a series of lectures and tutorials. There will be printed notes and example calculations during lectures. Tutorials involve helping students individually and occasionally working problems on the board.

5.0  Assessment

Assessment information will be provided separately.

6.0  Recommended textbooks

Category as defined by Central Library: C = Core, S = Supplementary

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<tr>
<td>S</td>
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<td>Young, Munson, Okiishi and Huebsch. Introduction to Fluid Mechanics. 5th edition.</td>
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<tr>
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<td>Elger, Williams, Crowe and Roberson. Engineering Fluid Mechanics. 10th edition</td>
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<td>Henderson. Open channel flows.</td>
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7.0  Subject threads

The table below shows how the themes of design, sustainability and health & safety risk management are embedded in the curriculum (as defined by the JBM degree guidelines).

Key: Primary (P), Secondary (S) and Contributory (C).

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CI9-FM-02 Modelling Tools

<table>
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<th>Dr Henry Burridge</th>
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<td>Pre- or co-requisites:</td>
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<td>7</td>
</tr>
<tr>
<td>Assessment:</td>
<td>Coursework</td>
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1.0 Aims

The aim of this module is to bring together fundamental fluid mechanics with mathematical modelling tools and deploy them to solve genuine physical phenomena of real application. Core to the module is the distillation of complex physical situations to simplified governing physics and clear presentation in both written and oral presentation.

2.0 Syllabus

This module will cover the following topics:

- Practical problem solving.
- Advanced dimensional analysis, scaling laws.
- Conservation laws, similarity solutions.
- Asymptotic analysis and perturbation expansions.
- Mathematical modelling and validations.
- Advance statistical analysis of experimental datasets and the coherent presentation of results.

3.0 Intended learning outcomes

On successfully completing this module, students will be able to:

- Set-up mathematical models of physical phenomena.
- Efficiently solve practical problems and enhance understanding of underlying physics of fluid flows.
- Validate mathematical models by laboratory experiments and/or numerical experiments.
- Analyse experimental datasets and identify key flow statistics.
- Present their results and understanding in oral and written form to both non-specialist peers and experts.
4.0 Teaching methods

The module will be taught using a series of lectures and tutorials. There will be printed notes and example calculations during lectures. Tutorials involve helping students individually and occasionally working problems on the board.

5.0 Assessment

Assessment information will be provided separately.

6.0 Recommended textbooks

Category as defined by Central Library:

C = Core, S = Supplementary
X = None recommended

7.0 Subject threads

The table below shows how the themes of design, sustainability and health & safety risk management are embedded in the curriculum (as defined by the JBM degree guidelines).

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</tbody>
</table>
1.0 Aims

This module aims to enable students to extend their understanding of transport processes in fluid mechanics and of turbulent mixing. The course will highlight their significance in the areas of pollutant dispersion in the environment (e.g. the atmosphere, rivers, lakes or oceans) and in sediment transport in rivers and coastal areas.

2.0 Syllabus

This module will cover the following topics:

- Overview of transport processes; active vs passive tracers; suspended vs dissolved matter.
- The advection-diffusion equations;
- Analytical techniques for solving advection-diffusion equations (e.g. Green's function methods, Laplace, Fourier transforms);
- Sediment transport: particle inertia, transport modes; threshold of motion, turbulent boundary layers, bedforms, morphology.
- Further applications.

3.0 Intended learning outcomes

On successfully completing this module, students will be able to:

- Appreciate the physical processes that govern the transport of fluids, tracers and sediment.
- Formulate mathematical models describing real world pollutant releases and sediment transport processes.
- Apply approximation and analytical techniques to solve these models.
- Understand the influence of fluid turbulence and dispersion on scalar transport and how these can be modelled.
4.0 Teaching methods

The module will be taught using a series of lectures and tutorials. There will be printed notes and example calculations during lectures. Tutorials involve helping students individually and occasionally working problems on the board.

5.0 Assessment

Assessment information will be provided separately.

6.0 Recommended textbooks

Category as defined by Central Library: C = Core, S = Supplementary

7.0 Subject threads

The table below shows how the themes of design, sustainability and health & safety risk management are embedded in the curriculum (as defined by the JBM degree guidelines).

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<tbody>
<tr>
<td>C</td>
<td>C</td>
<td>C</td>
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</tbody>
</table>
1.0 Aims

The purpose of this module is to provide an advanced course in wave mechanics, introducing the student to all the commonly applied wave theories, explaining the theory that underpins them, highlighting their range of validity, estimating their associated accuracy and emphasizing those situations in which the underlying physics dictates the application of the most advanced wave models. The course will address the role of unsteadiness, nonlinearity and directionality and will put this in the context of both recent research developments and the design requirements of the offshore and coastal engineering industries.

2.0 Syllabus

This module will cover the following topics:

- Introduction to ocean engineering, unsteady fluid flows and surface gravity waves.
- Small amplitude regular wave theory.
- Eulerian and Lagrangian representations of the flow field.
- Wave energy and group velocity.
- Linear and nonlinear irregular (or random) wave theories.
- Frequency spectra, directional spectra and wave statistics.
- Wind waves and swell waves
- The concept of a design wave
- Wave breaking
- Shallow water effects: wave evolution and modelling procedures.
- Interfacial waves.
3.0 Intended learning outcomes

On successfully completing this module, students will be able to:

- Understand unsteady fluid flows associated with surface gravity waves.
- Calculate the surface elevations and wave kinematics required for fluid loading.
- Determine the wave height and crest height statistics for engineering design.
- Accurately predict realistic wave conditions using nonlinear, directionally-spread irregular wave theories.
- Understand the limitations of the commonly adopted wave models.
- Predict the wave evolution that arises due to variations in the local water depth.

4.0 Teaching methods

The module will be taught using a series of lectures and tutorials, complemented by regular visits to the laboratory to understand the physics underpinning the evolution of a wave field. There will be printed notes and example calculations during lectures. Tutorials involve helping students individually and occasionally working problems on the board.

5.0 Assessment

Assessment information will be provided separately.

6.0 Recommended textbooks

Category as defined by Central Library:

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>S</td>
<td>The applied dynamics of ocean surface waves. C. C. Mei. World Scientific.</td>
</tr>
<tr>
<td>S</td>
<td>Water wave propagation over uneven bottoms. (Parts 1 and 2) M.W. Dingemans World Scientific.</td>
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</table>
7.0 Subject threads

The table below shows how the themes of design, sustainability and health & safety risk management are embedded in the curriculum (as defined by the JBM degree guidelines).

Key: Primary (P), Secondary (S) and Contributory (C).

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CI9-FM-05 Buoyancy-driven Flows (CI4-444)

<table>
<thead>
<tr>
<th>Course leader:</th>
<th>Professor Graham Hughes</th>
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<tr>
<td>Other contributors:</td>
<td>Dr John Craske</td>
</tr>
<tr>
<td>Module status:</td>
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<td>UG: CI1-140, CI2-240, CI3-340</td>
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<tr>
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<tr>
<td>Assessment:</td>
<td>Coursework, written examination</td>
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</table>

1.0 Aims

- To provide students with a detailed understanding of fluid motion driven by density differences and its relevance to processes in the atmosphere, rivers, estuaries, seas, buildings etc. and to Civil Engineering calculation and design.
- The course has a particular emphasis on buoyancy driven flows and turbulent mixing.

2.0 Syllabus

- Lectures are focused on developing an understanding of buoyancy forces and how the resulting flows are modelled.
- The coursework for this module consists of a computer laboratory exercise in which the students study data from direct numerical simulation (DNS) of both stratified and unstratified turbulent flow in a channel.

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<th>Topic</th>
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<td>Introduction to buoyancy and density-stratification; interfacial gravity waves; shear instability; gravity currents</td>
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</tr>
<tr>
<td>02</td>
<td>Convection</td>
<td>GH</td>
</tr>
<tr>
<td>03</td>
<td>Turbulent flows; the energy cascade and Kolmogorov scales</td>
<td>GH</td>
</tr>
<tr>
<td>04</td>
<td>Unstratified and stratified boundary layers</td>
<td>GH</td>
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<td>05</td>
<td>Stratified mixing</td>
<td>GH</td>
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<tr>
<td>06</td>
<td>Turbulent plumes in unconfined environments, self-similarity and scaling</td>
<td>JC</td>
</tr>
<tr>
<td>07</td>
<td>Turbulent plumes and mixing in confined environments</td>
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<td>08</td>
<td>Building ventilation: steady states driven by wind and buoyancy</td>
<td>JC</td>
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<tr>
<td>09</td>
<td>Building ventilation: time-dependent states</td>
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<td>10</td>
<td>Revision Lecture</td>
<td>GH, JC</td>
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</table>
3.0  Intended learning outcomes

On successfully completing this course unit, students will be able to:

- Understand the basic physics governing a range of buoyancy driven flows.
- Model gravity currents, plumes and boundary layers.
- Formulate integral models of volume and buoyancy and apply these to the ventilation of buildings.

4.0  Teaching methods

The lecture format of this module consists of three-hour blocks which are divided approximately equally between lecture and tutorial.

5.0  Assessment

Assessment for this module will consist of coursework and a written examination. The coursework will relate to material from either the first (taught by GH) or second (taught by JC) half of the module. Further assessment information will be provided separately.

6.0  Recommended textbooks

Category as defined by Central Library:

C = Core, S = Supplementary

<table>
<thead>
<tr>
<th></th>
<th>Title</th>
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<tr>
<td>S</td>
<td>Mixing in inland and coastal waters, 1979. HB. Fischer, J. List et al.</td>
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7.0  Subject threads

The table below shows how the themes of design, sustainability and health & safety risk management are embedded in the curriculum (as defined by the JBM degree guidelines).

Key: Primary (P), Secondary (S) and Contributory (C).

<table>
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<tr>
<td>C</td>
<td>C</td>
<td>P</td>
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</tbody>
</table>
1.0 Aims

The aims of this module are to:

- Provide hands-on experience of designing and performing experimental investigations for a wide range of fluid flows
- Instruct how to critically review existing literature within fluid mechanics

2.0 Syllabus

This module will cover the following topics:

- Demonstration and investigation of canonical flows in the Hydrodynamics Laboratory such as:
  - Plumes and jets
  - Gravity currents
  - Convection
  - Deep- and shallow-water waves
  - Regular, focused and random waves
  - Sediment dynamics and transport
- Data collection and analysis.
- Study and report on key associated papers.

3.0 Intended learning outcomes

On successfully completing this module, students will be able to:

- Describe flows in coastal, offshore and environmental engineering in terms of fundamental fluid mechanical phenomena.
- Critically appraise and analyse experimental measurements.
- Design appropriate measurement and processing techniques.
4.0  Teaching methods

The module will be taught using a series of experiments and tutorials.

5.0  Assessment

Assessment information will be provided separately.

6.0  Recommended textbooks

Category as defined by Central Library:

C = Core, S = Supplementary

7.0  Subject threads

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CI9-FM-07 Computational Analysis

<table>
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<tr>
<th>Course leader</th>
<th>Dr John Craske</th>
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<td>Spring</td>
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<td>Contact hours:</td>
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<td>FHEQ Level:</td>
<td>7</td>
</tr>
<tr>
<td>Assessment:</td>
<td>Coursework and written examination</td>
</tr>
</tbody>
</table>

1.0 Aims

- To demonstrate computational methods for the simulation and analysis of engineering fluid mechanics.
- To solve practical numerical modelling problems in the context of offshore, coastal and built environments.
- To analyse the accuracy and suitability of numerical models.
- To incorporate numerical methods into design problems.

2.0 Syllabus

This module will cover the following topics:

- Identify and describe different types of differential equations.
- Utilise mathematical modelling to formulate a priori estimations.
- Solve differential equations using numerical approximations.
- Evaluate the stability and accuracy of numerical approximations.
- Design algorithms to simulate flows and compare with experiments.
- Implement and analyse direct and large-eddy simulations of turbulence.

3.0 Intended learning outcomes

On successfully completing this module, students will be able to:

- Classification of partial differential equations.
- Finite differences, finite volumes and finite elements.
- Conservation laws.
- Boundary conditions.
- Explicit/implicit schemes; stability analysis.
• Accuracy, convergence, group velocity and dispersion.
• Godunov’s theorem and flux limiters.
• Immersed boundary method.
• Level-set and volume-of-fluid methods for multiphase flow.

4.0 Teaching methods

The module will be taught using a series of lectures and tutorials. There will be printed notes and example calculations during lectures. Tutorials involve helping students individually and occasionally working problems on the board.

5.0 Assessment

Assessment information will be provided separately.

6.0 Recommended textbooks

Category as defined by Central Library:

C = Core, S = Supplementary

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7.0 Subject threads

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CI9-FM-08 Fluid Loading

<table>
<thead>
<tr>
<th>Course leader:</th>
<th>Professor Chris Swan</th>
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<tr>
<td>Assessment:</td>
<td>Coursework and written examination</td>
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</table>

1.0 Aims

The purpose of this module is to provide a fundamental understanding of fluid loading; to explore the various flow regimes within which different types of loads arise; to understand the essential physics that govern the application of these loads; to appreciate the simplifying assumptions on which commonly applied design solutions are based; and to assess the accuracy of any calculated loads. Both steady and unsteady flows will be considered, with the results appropriate to the full range of civil engineering applications; the latter including wind, wave and current loading.

2.0 Syllabus

This module will cover the following topics:

- Fluid loading on static bodies - slender body theory.
- Diffraction solutions appropriate to large volume structures.
- Nonlinear loading components.
- Extreme loading - slamming and impacts.
- Compressibility and air entrainment.
- Conductor shielding.
- Wave and current blockage.
- Wave-in-deck loading.
- Dynamically responding bodies and dynamic systems.
- Hydrodynamic coefficients.
- Model testing and the relevant scaling parameters
- Load statistics and the determination of design loads.
3.0  Intended learning outcomes

On successfully completing this module, students will be able to:

- Undertake load calculations in a wide range of fluid flows.
- Understand the different loading regimes, the extent of any fluid structure-interactions and their implications for the predicted fluid loads.
- Understand the limitations of commonly applied engineering solutions.
- Calculate the loads on dynamically responding bodies.
- Appreciate the various scaling parameters and the limitations of model testing.
- Work with load statistics
- Define an appropriate design load.

4.0  Teaching methods

The module will be taught using a series of lectures and tutorials. This material will be complemented by regular visits to the laboratory to see examples of the different loads and the different loading regimes. Printed notes and example calculations will be provided during lectures and the students will get hands-on experience of undertaking some loading experiments. Tutorials involve helping students individually and occasionally working problems on the board.

5.0  Assessment

Assessment information will be provided separately.

6.0  Recommended textbooks

Category as defined by Central Library:

C = Core, S = Supplementary

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<th>Category</th>
<th>Title</th>
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<tr>
<td>C</td>
<td>Water wave mechanics for engineers and scientists. R. G. Dean &amp; R. A. Dalrymple. World Scientific</td>
</tr>
<tr>
<td>C</td>
<td>Mechanics of wave forces on offshore structures. T. Sarpkaya &amp; M. Isaacson. VNR</td>
</tr>
<tr>
<td>C</td>
<td>Sea loads on ships and offshore structures. O. Faltinsen. Cambridge University Press</td>
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### 7.0 Subject threads

The table below shows how the themes of design, sustainability and health & safety risk management are embedded in the curriculum (as defined by the JBM degree guidelines).

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</table>
**CI9-FM-09 Coastal Processes**

<table>
<thead>
<tr>
<th>Course leader</th>
<th>Dr Marios Christou</th>
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</thead>
<tbody>
<tr>
<td>Other contributors</td>
<td>Dr Jose Alsina</td>
</tr>
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<td>Pre- or co-requisites</td>
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<td>Term</td>
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<td>7</td>
</tr>
<tr>
<td>Assessment</td>
<td>Coursework and written examination</td>
</tr>
</tbody>
</table>

1.0 Aims

- Enable students to determine the nearshore characteristics of waves, currents, tides and storm surges.
- Equip students with the techniques required to calculate the wave and current processes that occur in the coastal zone.
- Provide students with an appreciation of how to protect natural or man-built coastal structures from the environmental forcing and physical processes that they experience.

2.0 Syllabus

- Wave transformations (shoaling, refraction, reflection, diffraction and breaking).
- Nonlinear waves (Stokes 5th, stream function and solitary waves).
- Tides and storm surge (theory, observations, prediction and surges).
- Surf-zone hydrodynamics (radiation stress, mass transport, mean water surface, run-up, long-shore currents, rip-currents and undertow).
- Sediment transport and morphodynamics (surf zone, swash zone, beach profile evolution and plan forms).

3.0 Intended learning outcomes

On successfully completing this course unit, students will be able to:

- Appreciate the multi-faceted nature of coastal problems and the techniques of coastal engineering analysis.
- Calculate the transformations waves undergo as they propagate from deep to shallow waters.
- Predict tidal variations and appreciate the impact of tides in the coastal environment.
- Calculate the detailed wave field in the vicinity of typical coastal structures.
• Determine wave run-up, long-shore and rip currents in the coastal zone.
• Calculate sediment transport in the surf and swash zone as well as the evolution of the beach profile.
• Appreciate the environmental impacts of coastal engineering works.

4.0 Teaching methods

The module will be taught using a series of lectures, tutorials and laboratory demonstrations. There will be printed notes and example calculations during lectures. Tutorials involve helping students individually and occasionally working problems on the board.

5.0 Assessment

Assessment information will be provided separately.

6.0 Recommended textbooks

Category as defined by Central Library: C = Core, S = Supplementary


7.0 Subject threads

The table below shows how the themes of design, sustainability and health & safety risk management are embedded in the curriculum (as defined by the JBM degree guidelines).

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</table>
1.0 Aims

The aim of this module is to gain a broad overview of our energy systems, with a particular focus on the central role that fluid mechanics plays in generating, harnessing and consuming energy. A variety of technologies will be covered in conjunction with the overall economic and policy setting.

2.0 Syllabus

This module will cover the following topics:

- Background and role of fluid mechanics in energy systems.
- The role of thermodynamics in assessing energy solutions.
- Energy demand, supply, resources and usage.
- Marine renewables (wave, tidal, offshore wind energy).
- Hydroelectric power and solar energy.
- The role of energy vectors and energy distribution systems.

3.0 Intended learning outcomes

On successfully completing this module, students will be able to:

- Appreciate the role of fluid mechanics in energy systems.
- Critically assess various renewable energy technologies and their key advantages and disadvantages.
- Apply the design calculations introduced throughout the MSc course to realistic energy systems, both onshore and offshore based
- Appreciate the wider aspects of energy systems, including economic drivers and energy policy
4.0 Teaching methods

The module will be taught using a series of lectures and tutorials. There will be printed notes and example calculations during lectures. Tutorials involve helping students individually and occasionally working problems on the board.

5.0 Assessment

Assessment information will be provided separately.

6.0 Recommended textbooks

Category as defined by Central Library:

C = Core, S = Supplementary

7.0 Subject threads

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CI9-FM-11 Urban Fluid Mechanics

<table>
<thead>
<tr>
<th>Course leader:</th>
<th>Dr Maarten van Reeuwijk</th>
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<tr>
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</tr>
<tr>
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<td>7</td>
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<tr>
<td>Assessment:</td>
<td>Coursework and written examination</td>
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</table>

1.0 Aims

- The purpose of this module is to bring students to the forefront of the current knowledge in modelling the built environment.
- Provide students with the tools required for both internal and external fluid flows in the built environment.

2.0 Syllabus

This module will cover the following topics:

- Atmospheric boundary layer dynamics; diurnal cycles; atmospheric stability.
- The surface energy balance: radiative forcing, latent and sensible fluxes; the urban heat island.
- Modelling momentum and heat exchanges using resistances.
- Transport processes in urban areas.
- Indoor climate and building energy performance.
- Air quality and micro-climates.
- Sustainability; strategies to mitigate the urban heat island.

3.0 Intended learning outcomes

On successfully completing this module, students will be able to:

- Appreciate the close relation between the built environment and the atmosphere overhead.
- Determine the expected energy-performance of buildings.
- Perform air quality calculations for urban canyons.
- Identify opportunities for sustainable urban development.
4.0 Teaching methods

The module will be taught using a series of lectures and tutorials. There will be printed notes and example calculations during lectures. Tutorials involve helping students individually and occasionally working problems on the board.

5.0 Assessment

Assessment information will be provided separately.

6.0 Recommended textbooks

Category as defined by Central Library: C = Core, S = Supplementary

7.0 Subject threads

The table below shows how the themes of design, sustainability and health & safety risk management are embedded in the curriculum (as defined by the JBM degree guidelines).

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CI9-FM-12 Design Projects

<table>
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<tr>
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<tr>
<td>Assessment:</td>
<td>Design reports and oral presentations</td>
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</table>

1.0 Aims

The aims of this module are to:

- Practically apply the taught material from all the modules.
- Gain a wider understanding of engineering design.
- Prepare students for working in industry.

2.0 Syllabus

This will consist of 4 one-week design projects focusing on the Fluid Mechanics of:

- Offshore Engineering
- Coastal Engineering
- Environmental Flows
- Built Environment

The students will undertake the projects in teams and submit a design report as well as give an oral presentation on their findings to the client. All groups are expected to address:

- Creative design and engineering solutions
- Cost and value, including the business case
- Constructability
- Risk assessment (financial and legislative) and management
- Health and safety strategy
- Sustainability and environmental impact
- Effective use of materials

Several workshops will be given during the module covering Health & Safety, Risk Assessments, Sustainability and Environmental Impacts. The derivation of Metocean design criteria will also be covered and students will be introduced to software packages such as ANSYS-FLUENT, openFOAM, Delft3D, SWAN and SWASH.
Example projects are given below.

**Offshore: Gravity Based Structure**
In this project students would outline the design of an offshore Gravity Based structure. This will involve understanding the importance of nonlinearity in extreme seas, assessing the applied loading and the dynamic response and determining the sensitivity to the adopted procedures.

**Coastal: Breakwater Design**
In this project students would design a breakwater to protect a harbour from a harsh wave environment. This will involve transforming waves from deep to shallow and performing diffraction calculations for the local wave fields. Consideration of different types of breakwater concepts and their effect on sediment transport will also be key.

**Environmental Flows: Hazard Management Plan**
In this project students would design a hazard management plan for accidental dense gas release from an industrial plant. The process will involve prediction of the gas cloud shape, concentration and subsequent dispersal and assessment of the effects of ambient wind and topography.

**Built Environment: Sustainable Urban Design**
In this project students will design or retrofit a building, focusing particularly on ventilation aspects, air-conditioning and building energy performance.

### 3.0 Intended learning outcomes

On successfully completing this module, students will be able to:

- Be inspired and appreciate the theoretical teaching they receive.
- Learn wider skill sets such as leadership, team working and presentation skills.
- Consider the sustainability and environmental impacts of their concepts.
- Appreciate the importance of ethics and legislation in the role of an Engineer during the design stage.

### 4.0 Teaching methods

The module will be taught using a series of workshops and supervised by academic staff and members of industry.

### 5.0 Assessment

Assessment information will be provided separately.
6.0  Recommended textbooks

Category as defined by Central Library: C = Core, S = Supplementary

7.0  Subject threads

The table below shows how the themes of design, sustainability and health & safety risk management are embedded in the curriculum (as defined by the JBM degree guidelines).

Key: Primary (P), Secondary (S) and Contributory (C).

<table>
<thead>
<tr>
<th>Design</th>
<th>Health &amp; Safety Risk Management</th>
<th>Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
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</table>
CI9-FM-13 Research Project

<table>
<thead>
<tr>
<th>Course leader:</th>
<th>Dr Marios Christou</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other contributors:</td>
<td>Professor Chris Swan, Professor Graham Hughes, Dr Maarten van Reeuwijk, Dr Jose Alsina, Dr Henry Burridge, Dr John Craske</td>
</tr>
<tr>
<td>Module status:</td>
<td>Core</td>
</tr>
<tr>
<td>Pre- or co-requisites:</td>
<td>CI9-FM-01 to CI9-FM-12</td>
</tr>
<tr>
<td>Term:</td>
<td>Summer</td>
</tr>
<tr>
<td>Contact hours:</td>
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</tr>
<tr>
<td>ECTS units:</td>
<td>30</td>
</tr>
<tr>
<td>FHEQ Level:</td>
<td>7</td>
</tr>
<tr>
<td>Assessment:</td>
<td>Dissertation, literature review and oral presentation</td>
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</tbody>
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1.0 Aims

To undertake a specific piece of independent research in the form of a critical review, a laboratory- or field-based experimental investigation, or a modelling/numerical analysis project.

2.0 Syllabus

The study will be supervised by one of the academics in the Fluid Mechanics section within the Civil & Environmental Engineering Department. Some students may opt to undertake their research project as part of an industry placement.

The students will be given an introduction to research techniques such as:

- Guide to technical writing
- Presentation skills
- Citations and reference manager
- Database searching

The research project will begin with an intensive literature review within their research area. The research project may be analytical, theoretical, experimental or numerical in nature, or a combination of these.

The students will submit a literature review, a technical report and give a final presentation at the end-of-year student conference. All three of these deliverables will be assessed by the supervisor and second examiner.

3.0 Intended learning outcomes

On successfully completing this module, students will be able to:

- Contribute to an active research area.
4.0 Teaching methods

The module will be delivered through a suite of introductory lectures on research methods and related material of importance to undertaking a research project, with students spending the remainder of the time working independently (under staff supervision, with possible support from PDRA and PhD researchers) on their projects to meet the research aims and objectives. Where appropriate students will be trained in experimental methods, use of analytical techniques, specialist software and computational tools.

5.0 Assessment

Assessment information will be provided separately.

6.0 Recommended textbooks

Category as defined by Central Library:

C = Core, S = Supplementary

7.0 Subject threads

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