MRes in Green Chemistry at Imperial College
2016-17

Course Handbook
Key dates for 2016-17

The MRes Green Chemistry course runs until the end of September 2017

Monday 3rd October 2016
09.00 – 10.00 MRes postgraduate welcome pack can be collected from Student services centre, Room 258, Level 2, Chemistry building
10.00 – 12.00 Welcome & Introduction to the Course (G47B, Flowers Building)
16.15 – 17.00 Welcome Talk by Rector, Director of Graduate School and GSA Chair (Great Hall, Level 2, Sherfield Building)

Tuesday 4th October 2016
11.00 – 16.00 Freshers’ Fair (Student Union, South Kensington campus)
16.00 onwards Fresher’s Fair afterparty (Student Union, South Kensington Campus)

Wednesday 5th October 2016
09.00 – 17.00 Sports Team Trials (Student Union, South Kensington campus)

Thursday 6th October 2016
12.00 – 13.00 Safety Talks - Primary Induction (Pippard Lecture Theatre, Level 5, Sherfield Building)
Attendance Compulsory
14.00 – 15.30 Safety Talks – Basic Laboratory Safety (Pippard Lecture Theatre, Level 5, Sherfield Building)
Attendance Compulsory

Friday 7th October 2016
14.00 – 17.00 Department of Chemistry Welcome Induction for all new MRes Postgraduates (Lecture Theatre C, RCS1 Building)

Saturday 8th October 2016
19.00 – 22.00 Postgraduate Mingle (Student Union, South Kensington campus)

From Monday 10th October 2016
Lecture courses begin (See timetable for specific times and locations)

Friday 21st October 2016
DEADLINE 12.00 Submission of 5 project choices in order of preference to the MRes programme coordinator Dr Mike Ray by email (michael.ray@imperial.ac.uk).

Wednesday 14th December 2016
DEADLINE 12.00 Research Proposal. Submit:
• one electronic copy of Research Proposal by email to Dr Mike Ray by email (michael.ray@imperial.ac.uk)
• one electronic copy of your Research Proposal (as word or pdf format) on Blackboard Learn (Virtual Learning Environment)

Week beginning Monday 9th January 2017
Exams week

February - May 2017
Journal club – Date and venues to be confirmed.
Thursday 24th August 2017

**DEADLINE: 12.00**  Dissertation. Submit:
- one electronic copy of Dissertation by email to Dr Mike Ray by email (michael.ray@imperial.ac.uk)
- one electronic copy of your Dissertation (as word or pdf format) on Blackboard Learn (Virtual Learning Environment)

28th August – 8th September 2017

Viva on Research Project (date, time and venue to be arranged by students)

Mid-September 2017

All day  Chemistry MRes Symposium – project presentations (venue to be confirmed)

Mid to End September 2017

All day  External Examiners meeting (date and location to be confirmed) – You may be called to a viva by the external examiners so you must be present in college for the whole day.

**Attendance Compulsory**

Important note: All dates and times can be subject to change at short notice and you are thus well advised to check your college email account regularly (daily), as we will use this to notify you of any changes to the above arrangements.
The MRes course in Green Chemistry at Imperial College is a multidisciplinary one-year course featuring the involvement of several world-class departments. Taught modules cover topics as diverse as clean solvents, renewable chemical feedstocks, environmental chemistry, biotechnology, renewable energy resources (including solar devices and fuel cells), biofuels, water treatment, carbon capture strategies and environmental technologies. In addition to lectures, you will spend nine months working on a cutting edge research project, typically with supervisors from at least two different departments.

Graduates of this course can expect to have all the necessary skills and experience to apply green chemical technologies in either commercial or academic laboratories, the research project in particular equipping them admirably for PhD studies.

If you have any queries not covered here, please contact the MRes Programme Coordinator Dr Mike Ray (michael.ray@imperial.ac.uk) in the first instance. If further advice is necessary, please contact the Course Director, Dr James Wilton-Ely (j.wilton-ely@imperial.ac.uk). The links below contain useful information:

- The MRes Green Chemistry Website:  
  http://www.imperial.ac.uk/chemistry/postgraduate/mres-courses/green-chemistry/

- Health and safety information (Occupational Health requirements, vaccinations, use of equipment, training etc):  
  http://www3.imperial.ac.uk/estatesfacilities/about/healthandsafety

- Imperial Study Guide / Imperial Study Guide for Master’s Students:  
  http://www.imperial.ac.uk/students/success-guide/

- New Postgraduates Students website:  
  http://www.imperial.ac.uk/students/new-students/postgraduates/

- MRes Code of Practice:  
  http://www3.imperial.ac.uk/registry/proceduresandregulations/qualityassurance/codesofpractice/codeofpracticeformresprogrammes

- Information about the Graduate School:  
  http://www.imperial.ac.uk/study/pg/graduate-school/

- Transferable Skills Training:  
  http://www.imperial.ac.uk/study/pg/graduate-school/professional-skills/

For other useful links, see page 34 of this Handbook.

**Contacts**
MRes Programme Coordinator: Dr Mike Ray (michael.ray@imperial.ac.uk). First point of contact for queries (or you may prefer to talk to the Director of MRes Studies).
Course Director & Director of MRes Studies: Dr James Wilton-Ely (j.wilton-ely@imperial.ac.uk).
Welcome to Imperial College

The welcome talks for new Master’s students will take place on **Monday 3rd October at 16.15** in the Great Hall, Sherfield Building. The welcome talks will be led by the Provost and will last approximately 45 minutes and include welcomes from the Director of the Graduate School and Imperial College Union (ICU) and the Graduate Students’ Association (GSA).

Open Day for those interested in further study at Imperial which will take place on Wednesday 3rd December 2016 from midday in the Great Hall, Sherfield Building.

The Student Union

You are reminded that all new students should have the opportunity to attend the following events:

Tuesday 4th October: Freshers’ Fair – 11.00hrs – 16.00hrs
Saturday 8th October: Postgraduate Mingle – from 19.00

See the Welcome Week Timetable for more information: [http://www.imperial.ac.uk/students/new-students/](http://www.imperial.ac.uk/students/new-students/)

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**MRes in Green Chemistry: Energy and the Environment – Timetable**

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<tr>
<td>Lecture Courses (core and optional)</td>
<td>Proposal</td>
<td>Journal Club (4 days in this period)</td>
<td>Research Project</td>
<td>Poster</td>
<td>Dissertation</td>
<td>Presentation</td>
<td>Viva</td>
<td>Exams</td>
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Overview of the course

How the course is constructed:
70% research and 30% taught. Actual breakdown:
Research: Research Proposal (10%), Dissertation (55%), Viva (5%), Oral Presentation (5%)
Taught: Exams (10%), Journal Club (10%), Energy Poster (5%)

On arrival in October, a list of projects (with abstracts) will be provided for the students to look through. They should then contact the relevant supervisors to discuss their favourite potential projects. The students submit their top 5 projects in order and the Course Director will aim to assign the projects according to these wishes.

Research proposal
This will be on the research project topic chosen by the student and is based on the EPSRC proposal format. The deadline is at the end of the 1st term. These will be marked and second marked by supervisors of Green Chemistry students.

Dissertation
Students start their projects in December or January and are embedded in their respective groups. The Dissertation is 60-80 pages in length and must be handed in by the deadline of first week of September. These are marked and second marked by supervisors of Green Chemistry Students.

Viva
This is an oral exam on the topic of your research and will be conducted with supervisor(s) and an external assessor present.

Journal Club
This is an assessed transferable skills course, which aims to develop presentation skills, whilst encouraging scientific debate, and providing the opportunity to broaden scientific knowledge. There will be four journal clubs during the year.

Energy Poster Project
After an initial talk (by Dr Jeremy Woods, CEP) and discussion on the various renewable energy sources being considered worldwide, the students will be split into groups and assigned a country for their poster project. A month later they will present their poster on the current energy situation and the options for that country in 2050. The posters and presentations will be marked by Drs Woods and Wilton-Ely.

The energy poster project is a chance for a wide-ranging discussion of energy sources

Exams
MRes students must attend the four core lecture courses described below. Optional courses can be taken in order for students to expand their knowledge but these will not be examined. Students should consider the time they spend attending optional lecture courses in order to maintain a good balance between time spent on these and their other commitments, which attract credit.
Core courses:
I-S7 Renewable Energy: from solar cells to fuel cells: the chemistry of sustainable energy (12 x 1h lectures, Prof. Kucernak and Prof. Durrant, Term 1).
I-S6 Plastic Electronics: from materials chemistry to device applications (12 x 1h lectures, Prof. Heeney, Prof. McCulloch, Dr Haque, Prof. de Mello and Prof. Durrant, Term 1).
GC-1 Green Solvents (4 x 2h lectures, Dr Hallett, Chemical Engineering, Term 2)
GC-2 Recycling Metals from Waste (4 x 2h lectures, Dr Serpe, Chemistry, Term TBC)

Optional courses (not for credit):
I-S2 Nanomaterials (12 x 1h lectures, Prof. Shaffer, Prof. Harrison and Prof. Durrant, Term 1).
I-S3 Advanced Catalysis (12 x 1h lectures, Dr Cordier and Dr Hii, Term 1).
CHE.428 Clean fossil fuels (Chemical Engineering, 10 x 2h lectures plus coursework, Prof. Maitland, Prof. Brandon, Prof. Blunt, Prof. Hellgardt, Dr Fennell, Dr Millan-Agorio, Dr La Force and Dr Martinez-Botas, Term 2).

Last year’s exam papers and guide answers will be provided during the first term. Guide answers are NOT written for students, but are written for the External Examiner who reviews our questions and for the second markers to provide a guideline for marking. As such, they are sometimes lacking in detail, they occasionally have mistakes that only come to light when the marking starts, and there may be more than one way to answer a question. You should not treat them as anything other than a guide as to how a question should be answered.
- Students must attain 50% overall for the Taught Element of the course. If they need to retake a failed exam, retakes happen the next academic year.
- The students will receive a provisional letter grade for their exams and all other assessments (not a numerical mark). The grade for the exams will be ready in late February/early March. For essays, the grade will be released within a month of essays being handed in.
- The GC-1 and GC-2 courses are examined by essay and students will choose from a selection of papers to critically review.

Oral presentation
A symposium of short presentations by the whole cohort will be held in mid-September. This is given in front of peers and marked by a selection of Green Chemistry supervisors.
Weekly meetings
One hour meetings are held every week (from January), normally on Wednesday afternoons at 5 pm. Attendance is compulsory unless there is a good reason not to attend (e.g., illness, travel abroad). These meetings are an important part of the course and take precedence over research group meetings. They provide an opportunity for the students on the course to get to know each other and to raise queries with the Course Director. From January, these meetings will also feature presentations from three students - one on a literature topic and two on their research (each will be 12 mins + questions). When the Course Director is not present, organisation of these meetings is undertaken by the students. Tea, coffee and biscuits are provided.

Additional seminars
Links will be provided so that MRes Green Chemistry students can attend non-compulsory seminars and lectures in other departments such as the Centre for Environmental Policy (CEP) and the Energy Futures Lab. For example, the CEP lunchtime seminars are worth attending.

Site visits
In order for the students to play a full part in the programme, they are encouraged to suggest and plan site visits to recycling plants, biorefineries etc. Financial support will be provided.

Attendance and Holidays
The course runs for 12 months and is full-time. Attendance is compulsory during the official Imperial College (undergraduate) term dates (this is especially important for students with visas), however postgraduate research continues throughout the year and does not follow the undergraduate term dates. Students are expected to arrange any time away with their supervisors and let the Course Director know if it means being absent from the MRes Green Chemistry Weekly Meetings. All coursework assessments, exams, hand-in dates will fall within the College term times.

Overall Mark for MRes
The MRes degree has the following borderlines for the classifications:

- 50% Pass, 60% Merit, 70% Distinction.

As explained above, the course is divided into research (75%) and taught (25%) elements. The actual breakdown is:

**Research:** Research Proposal (10%), Dissertation (55%), Viva (5%), Oral Presentation (5%)

**Taught:** Exams (10%), Journal Club (10%), Energy Poster (5%)
In order to obtain a Distinction, an overall score of at least 70% must be obtained for the course AND at least 60% in either the Taught or Research Element. For a Merit, an overall score of at least 60% must be obtained for the course AND at least 50% in either the Taught or Research Element. In order to obtain a Pass classification, an overall score of at least 50-59% must be obtained in all Elements of the course.

Some latitude may be shown at the discretion of the External Examiner if students are close to a borderline. In these cases, the External Examiners may wish to interview the student (viva) to determine whether they should be promoted to the higher classification. The External Examiner is Professor Peter Licence, University of Nottingham.

Centre for Academic English
The Centre for Academic English (CAE) provides free, dedicated support to international MRes students in science, engineering and medicine. Their aim is to help you communicate your research during the different stages of your degree as accurately and as professionally as possible. Through collaborating with the course directors and supervisors, they will help you to better understand their expectations in terms of the content, format, and style of your assignments. They then provide you with the relevant language skills to present your research effectively. The core component is a weekly Academic Writing class with a dedicated writing tutor who will offer sessions specifically designed to meet the needs of your research degree.

You will need to register at the link below:
http://www3.imperial.ac.uk/academic-english/mres

Feedback
Meetings are held every week and the Course Director will often be present. In addition to the chance to hold presentations in front of the whole group, this is an opportunity to ask questions and receive general feedback for the whole group. Marks will be communicated privately by the Course Director and discussion of them can be arranged with him as desired. Since the student’s supervisors are first markers for all project assessments, they should be approached initially. A summary of comments by the independent marker can be obtained from the Course Director. A meeting can be arranged with the Course Director if the student wishes to discuss a mark further. Outline answers are released soon after the exams have been taken and this provides feedback to students to see where they may have lost marks.

Student Surveys
Your feedback is important to your department, the College and Imperial College Union. Whilst, there are a variety of means 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
- Student Experience Survey (SES)
- Postgraduate Taught Student Experience (PTES)

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. Run at the same time as the Autumn Term PG SOLE is the Union’s Student Experience Survey (SES). This survey will cover your induction, welfare, pastoral and support services experience. During December you will receive an email in your Imperial College account with a link to the survey.

The Postgraduate Taught Experience Survey (PTES) is the only national survey of Master’s level (MSc, MRes, MBA and MPH) students we do and so 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. During the spring term you will receive an email in your Imperial College account with a link to the survey.

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. As a result of feedback to previous surveys, for example, we have removed some lecture courses from the programme and added others. If you would like to know more about any of these surveys or see the results from previous surveys, please visit: http://www3.imperial.ac.uk/registry/proceduresandregulations/surveys

For further information on surveys please contact the Registry’s Surveys Team on surveys.registriesupport@imperial.ac.uk

Safety
The department, in conjunction with the Graduate School runs induction activities for all new MRes students in October each year. These include the mandatory Primary Induction session and the Basic Lab Safety Lecture (which details the department’s requirements for safe practice in your research). Details of this induction programme will be given to you by the MRes Programme Coordinator, Dr Mike Ray.

Further details of departmental safety procedures and waste disposal can be found on our website at http://www.imperial.ac.uk/chemistry/about/safety/ or by contacting the faculty safety manager, Stefan Hoyle (s.hoyle@imperial.ac.uk). There are two other courses that are mandatory for all new PG students;

1. **Risk Assessment Foundation Training (RAFT)** - This is run as a Blackboard course and test for PG students. RAFT is a realistic and practical way to learn about the College’s risk assessment process via video scenarios based on one’s own work environment. After an introduction on why risk assessments are required, the learner is taken through the process of risk assessment before engaging with a series of video scenarios representative of their own work environments.

2. **Fire Prevention and Fire Safety at Work** – This course will be organised for you and should be completed in the first term prior to you starting in the lab for your research projects. The course is aimed at reducing the likelihood of fires starting and what action to take in the event of a fire. The course covers; How fires start and spread, Steps to take to prevent fires, Methods of extinguishing fires, Types of fire fighting equipment and their uses, Smoke and gas hazards produced by fires, What to do in the event of discovering a fire and When not to tackle a fire.

You must undertake your research in accordance with safety regulations and procedures, as agreed with your supervisor (who is responsible for your health and safety). If you have any doubts about any safety aspects of your work or work environment, you should discuss these with your supervisor.
There are a number of individuals in the Dept. you can contact about specific health and safety issues, they are listed below:

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<tr>
<th>Position</th>
<th>Name</th>
<th>Email</th>
<th>Phone</th>
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<tbody>
<tr>
<td>Chemical Safety Officer</td>
<td>David Mountford</td>
<td><a href="mailto:d.mountford@imperial.ac.uk">d.mountford@imperial.ac.uk</a></td>
<td>020 7594 7177</td>
</tr>
<tr>
<td>Laser Safety Officer</td>
<td>Stoichko Dimitrov</td>
<td><a href="mailto:s.dimitrov@imperial.ac.uk">s.dimitrov@imperial.ac.uk</a></td>
<td>020 7594 8558</td>
</tr>
<tr>
<td>Biological Safety</td>
<td>Stefan Hoyle</td>
<td><a href="mailto:s.hoyle@imperial.ac.uk">s.hoyle@imperial.ac.uk</a></td>
<td>078 7285 0018</td>
</tr>
<tr>
<td>X-Ray Radiation Protection Supervisor C1/C2</td>
<td>Nick Brooks</td>
<td><a href="mailto:nicholas.brooks@imperial.ac.uk">nicholas.brooks@imperial.ac.uk</a></td>
<td>020 7594 2677</td>
</tr>
<tr>
<td>X-Ray Radiation Protection Supervisor</td>
<td>Oscar Ces</td>
<td><a href="mailto:o.ces@imperial.ac.uk">o.ces@imperial.ac.uk</a></td>
<td>020 7594 3754</td>
</tr>
<tr>
<td>X-Ray Crystallography Radiation Protection</td>
<td>Andrew White</td>
<td><a href="mailto:a.white@imperial.ac.uk">a.white@imperial.ac.uk</a></td>
<td>020 7594 2016</td>
</tr>
<tr>
<td>Heavy &amp; Mechanical Lifting assessor/Advisor</td>
<td>Lee Tooley</td>
<td><a href="mailto:l.tooley@imperial.ac.uk">l.tooley@imperial.ac.uk</a></td>
<td>020 7594 7877</td>
</tr>
<tr>
<td>Electrical Safety Technician</td>
<td>Stefanos Karapanagiotidis</td>
<td><a href="mailto:s.kapa@imperial.ac.uk">s.kapa@imperial.ac.uk</a></td>
<td>020 7594 5746</td>
</tr>
<tr>
<td>Chemical Control, Disposal &amp; Technical Systems</td>
<td>Damion Box</td>
<td><a href="mailto:d.box@imperial.ac.uk">d.box@imperial.ac.uk</a></td>
<td>020 7594 5746</td>
</tr>
<tr>
<td>First Aid Co-ordinator</td>
<td>Simon Mann</td>
<td><a href="mailto:s.mann@imperial.ac.uk">s.mann@imperial.ac.uk</a></td>
<td>020 7594 5814</td>
</tr>
<tr>
<td>Display Screen Equipment (DSE) Assessor</td>
<td>Sara Jagambrun</td>
<td><a href="mailto:j.saradambal@imperial.ac.uk">j.saradambal@imperial.ac.uk</a></td>
<td>020 7594 5814</td>
</tr>
<tr>
<td>Ladder &amp; steps Inspector</td>
<td>Chris Wood</td>
<td><a href="mailto:c.wood@imperial.ac.uk">c.wood@imperial.ac.uk</a></td>
<td>020 7594 5814</td>
</tr>
<tr>
<td>Centrifuges coordinator</td>
<td>Andrew Coulson</td>
<td><a href="mailto:andrew.coulson@imperial.ac.uk">andrew.coulson@imperial.ac.uk</a></td>
<td>020 7594 5746</td>
</tr>
<tr>
<td>Faculty Safety Team</td>
<td>Stefan Hoyle</td>
<td><a href="mailto:s.hoyle@imperial.ac.uk">s.hoyle@imperial.ac.uk</a></td>
<td>078 7285 0018</td>
</tr>
<tr>
<td>Faculty Safety Team</td>
<td>Felicity McGrath</td>
<td><a href="mailto:f.mcgrath11@imperial.ac.uk">f.mcgrath11@imperial.ac.uk</a></td>
<td>077 1405 1234</td>
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When in laboratories you are expected to apply **Safe Lab Practice** as described below:

**Preparation for lab work**

**DO:**
- Wear clothing which minimises potential for skin exposure – **you must have no exposed skin below the waist**.
- Remove dangling jewellery and items that can get contaminated or caught in equipment.
- Wear sensible shoes which cover your feet completely.
- Tie back long or loose hair.

**DON'T:**
- Wear clothing that drags on bench/floor.
- Wear clothing you care about.
- Wear expensive jewellery as it may get tarnished by chemicals.
- Wear sandals/flip-flops or other open shoes in the lab.
- Wear contact lenses - use prescription glasses with safety glasses or prescription safety glasses.

**General rules when working in the laboratory:**

**DO:**
- Ensure personal items are stored outside of the laboratory or in the containers provided.
- Check the safety signs on lab entry doors to identify the personal protective equipment required.
- Cover cuts or abrasions on the hands with suitable water resistant covering.
- Change your lab coat if it gets contaminated or dirty.
- Wash hands before leaving the lab.
- Maintain clear passages to lab exits.
- Ensure waste bins are emptied regularly.

**DON'T:**
- Leave any personal items on lab benches or outside of the containers.
- Eat, drink, smoke or apply cosmetics in the laboratory.
- Wear lab coats and gloves in any “clean areas” such as offices, toilets, seminar room/lecture theatres, or for handling items such as phones and door handles.
- Chew pens or pencils, rub the eyes or face with gloved hands.
- Use mobile phones in the laboratory.
- Wear any equipment that will interfere with hearing audible alarms.
Housekeeping:

**DO:**
- Keep your lab workspace in a tidy state and wipe down lab benches and other work surfaces after use.
- Clear up spillages in the lab and inform others working in the area of the spill.
- Know the locations of the emergency showers and exits.
- Dispose of used consumables and waste in the appropriate waste bin.

**DON'T:**
- Leave any sharps (needles, scalpels etc) exposed on work surfaces
- Reuse disposable lab gloves
- Leave experiments unattended without suitable label including name, date, hazards and your emergency contact number
- Ignore warning alarms associated with equipment

Accidents
Generic emergency procedures will be explained on induction. Specific emergency procedures are detailed in risk assessments. Accidents and near misses must be reported, this is done via the College on line incident reporting system, SALUS: http://www3.imperial.ac.uk/safety/subjects/reportingaccidents/reportinganincident.
SALUS can be accessed via the Department safety web pages; http://www3.imperial.ac.uk/chemistry/safety or via the college Safety Dept. Web pages: http://www3.imperial.ac.uk/safety

Disclosure of vulnerability
If you have any health condition or are taking treatment that could cause you to lose consciousness, affect your alertness or for which you might require emergency assistance, you should let your senior tutor or your supervisor know so that they can be in a position to organise help for you if ever needed and ensure appropriate precautions are put in place if necessary to ensure your safety. For health conditions for which you might require emergency help it is also worth letting a couple of friends know as well, so they can know what to do if you needed help away from the Department. All students should register with a doctor in London as soon as possible. This is particularly important if you have any health problems that require regular treatment. All students living in central London Halls can and should register with the College Health Centre. Students living outside halls may also be able to register. Check the Health Centre website for information www.imperialcollegehealthcentre.co.uk

**PLAGIARISM**
The Department and College take plagiarism very seriously. Do not plagiarise. Plagiarism is defined as the theft of another's thoughts or writings and presenting them as the plagiarist's own. Cutting and pasting from an article or any another person's work is plagiarism, even if you cite them (the exceptions to this are direct quotations). Plagiarism also encompasses submitting the same piece of work for more than one unit as assessment. Plagiarism will not be tolerated in the Department and if it is detected in a student's work presented for assessment, it will be reported, together with the evidence, to the course supervisor, Head of Teaching Section and the Director of Undergraduate Studies who will take appropriate action. The penalty for proven cases can vary from loss of marks to expulsion by the University. Always cite your sources. For details of the College policy re-plagiarism see: http://www3.imperial.ac.uk/portal/pls/portallive/docs/1/7289138.pdf

All MRes students must complete the online postgraduate plagiarism awareness course by following the link below. http://www.imperial.ac.uk/study/pg/graduate-school/professional-skills/plagiarism-awareness-course/
MRes Green Chemistry Lecture Courses

Core courses:

I-S7 Renewable Energy: from solar cells to fuel cells: the chemistry of sustainable energy (12 x 1h lectures, Prof. Kucernak and Prof. Durrant, Term 1).
This course aims to present an overview of different approaches to renewable energy, focusing on solar cells, solar driven fuel synthesis, hydrogen storage and fuels cells. It will discuss chemistry's role in the past, present and future development of these renewable energy technologies. Through this course, the students will have an understanding of the chemistry behind these technologies and their role in a more developing sustainable economy and will also be able to critically, and quantitatively, evaluate different approaches to these technologies. In addition insight will be gained into how, as a chemist, one could contribute to the development of renewable energy science and technology.

I-S6 Plastic Electronics: from materials chemistry to device applications (12 x 1h lectures, Prof. Heeney, Prof. McCulloch, Dr Haque, Prof. de Mello and Prof. Durrant, Term 1).
This lecture series will allow the students to identify potential applications based on a semiconductor's molecular structure. It will explain the basic mechanisms of OLED, OFET and OPV devices and the importance of electronic energy levels at interfaces. The students will learn how to design an organic semiconductor to have defined energy levels and morphology (i.e. understand the influence of molecular functionality on electron density, p orbital conjugation, planarity). The course will provide rational synthetic routes for synthesis of a typical conjugated aromatic polymer based on routes discussed.

GC-1 Green Solvents (4 x 2h lectures, Dr Hallett, Chemical Engineering, Term 2)
This course investigates what makes a solvent ‘green’. It surveys the literature of solvent types that are being advocated as Green replacements for currently used solvents. The first three lectures are formal presentations; the remainder of the course is taught by reading review papers, followed up by discussion classes. The examination is by essay.

GC-2 Recycling Metals from Waste (4 x 2h lectures, Dr Serpe, Chemistry, Term TBC)
The recovery and re-use of metals from electrical and other waste will become ever more important as the use of these metals increases and new applications are found. The scarcity and geographical location both play important roles in the cost and availability of metals, that are often found ‘green’ technologies (e.g., automotive catalytic converters). These lectures examine the means by which waste electronic and electrical equipment (WEEE) and other sources can be recovered and returned to the original form or, alternatively, used in an intermediate state for a new application. The course will also provide a background in ligand design and coordination chemistry chemistry in this context. The examination is by essay.

Optional courses (not for credit):

I-S2 Nanomaterials (12 x 1h lectures, Prof. Shaffer, Prof. Harrison and Prof. Durrant, Term 1).
An introduction to the field will be provided along with synthetic approaches to nanomaterials via both liquid phase chemistry and physical vapour / chemical vapour deposition of 0D, 1D, and 2D nanomaterials. Characterisation using electron and probe microscopy, optical spectroscopy will be discussed. Examples of properties and applications will be provided. This will be followed by an introduction to quantum confinement and optoelectronic properties (eg: photoluminescence,
photocatalysis), inorganic, organic and hybrid systems. In the last part of the course, quantum and classical modelling of nanomaterials will be discussed along with practical quantum theory, molecular dynamics & Monte Carlo simulations. These will be illustrated by examples applied to semiconductor and organic materials.

I-S3 Advanced Catalysis (12 x 1h lectures, Dr Cordier and Dr Hii, Term 1).

This course will commence with an introduction to kinetics in catalysis, covering basic concepts of chemical kinetics and catalysis, rate laws for catalytic cycles, Reaction Progress Kinetic Analysis (RPKA) and, finally, modelling of catalytic reaction kinetics. This will be followed by an introduction to palladium-catalysed cross-coupling reactions, such as Heck-type reactions, allylic substitution reactions (including asymmetric) and involve a discussion of catalyst design. The application of kinetics for rationalising selectivities (chemo, regio and stereo) will also be presented. In the last part, enantioselective catalysis will be discussed in terms of enamine and iminium species, chiral Lewis acids and bases, H-bond donors and Brønsted acids and chiral ion pairs.

CHE.428 Clean fossil fuels (Chemical Engineering, 10 x 2h lectures plus coursework, Prof. Maitland, Prof. Brandon, Prof. Blunt, Prof. Hellgardt, Dr Fennell, Dr Millan-Agorio, Dr La Force and Dr Martinez-Botas, Term 2).

Educational aims of the course

1. Learning outcomes

The programme aims to:
- Produce science postgraduates equipped to pursue careers relating to sustainable technologies, in academia, industry, the public sector and non-governmental organisations
- Develop the ability to undertake research in multidisciplinary teams
- Develop knowledge of a range of basic and advanced Green Chemistry concepts
- Develop research and analytical skills related to sustainable technology research
- Develop oral and written scientific presentation skills
- Attract the most able and motivated physical sciences graduates from the UK and from overseas
- Develop teaching methods in response to scholarship advances and vocational training needs

Considering the above aims, the main outcome of the programme is to provide opportunities for postgraduate students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

a) Knowledge and understanding of:
- Core concepts in Green Chemistry including analytical tools and techniques
- Research techniques, including information retrieval, experimental design and laboratory safety
- Detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to the student's project
- Management and communication skills, including problem definition, project design, decision processes, teamwork, written and oral reports, scientific publications

b) Intellectual skills. To be able to:
- Analyse and evaluate sustainability issues using a multidisciplinary integrated approach
- Integrate and evaluate information
- Formulate and evaluate hypothesis
- Plan, conduct and write up a programme of original research

c) Practical skills
- Plan and execute safely a series of experiments
- Use laboratory–based methods to generate data
- Analyse experimental results and determine their strength and validity
- Prepare technical reports and give technical presentations
- Use the scientific literature effectively
- Use relevant computer packages

d) Transferable skills
- Communicate effectively through oral presentations, computer processing and presentations, written reports and scientific publications
- Management skills: decision processes, objective criteria, problem definition, project design and evaluation, risk management, teamwork and coordination
- Integrate and evaluate information from a variety of sources
- Transfer techniques and solutions from one discipline to another
- Use information and communications technology
- Manage resources and time
- Learn effectively for the purpose of continuing professional development
**Student responsibilities**

The MRes course is a postgraduate assignment and as such is not following undergraduate timing. There is no term-free time in this course. Students should be aware that their course is full-time employment up to the end of September. Any holidays or sick-leave will have to be taken at the discretion of the supervisors, but should under no circumstances be taken in the examination periods of January and May.

It is mandatory to attend all scheduled lectures, seminars, courses and exams. Missing an exam without any support from a doctor’s letter for the day of the exam will count as failure. It is the responsibility of the student to ensure that sufficient time is allocated for the exam and write-up preparation.

Students should contact the Course Director for discussion of all matters concerning problems with the supervision of the projects or other pastoral difficulties.

Students are expected to organise, conduct and present their research project in an independent fashion. The supervisory role is to guide and advise the student intellectually as well as technically, but it is not the supervisor’s responsibility to do the thinking or the work for the student. All projects will have at least two supervisors. Both supervisors should be approached for guidance. It is the student’s responsibility to make an effort and seek contact with their supervisors on a regular basis.

In order to pass the course successfully students have to pass both the Taught and Research Elements of the course. This includes the written exams, the research proposal, journal club, the dissertation and the oral presentations.

At the end of the course an external examiner will assess the examination process. All students have to be available on this day unless instructed otherwise. Students that are either at boundaries between marks (i.e. pass/failure or merit/distinction) could get an additional oral examination (viva) that will determine their final mark.

Students should seek guidance with respect to their write-up from their supervisors, since they will be involved in the marking. After completion of the Research proposal students should seek feedback from their corresponding supervisors to help improve the quality of their final Dissertation.

Students are required to submit an electronic version of the Dissertation to their supervisors. Additionally, they must hand over all notes, lab-books, results, computer programs etc to their supervisors at the end of the course.
Professional Development for Master’s students

Introduction
An Imperial College Master’s degree provides students with high quality, discipline specific training. To complement this we wish to ensure that all Master’s students obtain generic skills training with a view to providing skills relevant both for their degree and for future employment. It is recognised that there is excellent practice with respect to professional development skills embedded within many Master’s courses. In addition, many Master’s courses make use of the current MasterClasses provided by the Graduate School while others benefit from the professional development skills courses developed for our doctoral students. However what is currently lacking is a formalised College-wide approach to the generic skills training for all our Master’s students. Following the recent College review of transferable skills it has been decided that all Master’s students at Imperial should receive professional development training with a view to particularly developing:

- Reflective independent learning
- Critical thinking
- Communication of complex ideas
- Interdisciplinary awareness
- Project and time management
- Flexibility and ability to manage complexity
- Networking skills

Professional development skills requirement
As mentioned above it will be Course Directors’ responsibility to ensure that the professional skills component is embedded into each Master’s course. It is also expected that all students are given the opportunity to further develop their generic skills within their Master’s course, for example by giving poster and oral presentations. It is important that students are receiving feedback on such existing professional development elements. Clear statements should be made in course handbooks so that the professional development content is evident to students. The professional development components of Master’s Programmes will be assessed by the Master’s Quality Committees through annual monitoring.

Embedding the professional development skills components
Course Directors will be responsible for ensuring that the different components are embedded within their respective courses. Support will be given in the provision of Master’s training by the Postgraduate Development Unit (Head: Elaine Walsh). Two new staff members, a teaching fellow and an e-learning technologist, with responsibility for development and delivery of Master’s training courses, have been appointed to start in August. The Postgraduate Development Unit (PDU) will support Course Directors for example by outlining the professional development skills requirement, providing course materials and providing guidance on ensuring adequate feedback on generic skills training. In addition we aim to disseminate examples of good practice and generate links between individual courses with a view to encouraging the sharing of existing training resources where possible.

Currently Master’s students may attend appropriate Graduate School professional skills courses and this will still be possible during the 2016-2017 academic year. Where there are Master’s Programmes which have a requirement for their students to attend specific Graduate School professional development course(s), we will be able to maintain existing arrangements for 2016-2017, but will move away from this model over the next few years and embed all required training within the Master’s course itself. As described above, help and support will be provided to facilitate this transition.
**MasterClasses**
Currently the Graduate School runs a series of MasterClasses at the South Kensington, Hammersmith and Silwood Park Campuses. These are normally in the form of 90 minute lectures held over lunchtime. The current MasterClasses are:

- Note-taking and Efficient Reading
- Research Skills and Reference Management
- Preparing and Writing a Literature Review
- Stress Management
- Academic Writing
- Developing your Career through Networking
- Interview Skills
- Job Search with a Difference
- Informational Posters - Layout and Design.
- Interpersonal Skills
- Negotiating Skills

**E-learning tools**
The Graduate School is in the process of setting up a dedicated website for Master's students. This will contain information on the courses available to Master’s students as well as links to information on the support and advice available for Course Directors. This site will also contain links to existing e-learning tools which are of relevance to at least some of our Master’s students. There is an excellent on-line maths and statistics tool which will be available on Blackboard and additional courses are being developed. In addition the Masters e-learning technologist will be developing specific tools on plagiarism. New e-learning tools may be developed in consultation with specific Course Directors. We also have two DVDs covering presentation skills and oral examination skills.

Although the PDU is able to help substantially in the development and delivery of generic skills course, it will be the responsibility of the Course Director to arrange training in skills specific to a particular Master's programme.

**Careers Advisory Service (CAS)**
Each year in October and again in January, the CAS hold a lunchtime talk aimed mainly at incoming Master’s students on “Working in the UK”. In addition, there are some specific whole day workshops for Master’s students to provide last minute help and advice on job hunting. The CAS also provides bespoke careers advice sessions to individual Master's courses which are delivered at different College campuses. If a Course Director feels their students could benefit from such a course then they can contact the CAS directly to arrange a session.

**Updates to the programme**
New developments and updates to the programme will be disseminated in the Graduate School's newsletter to Course Organisers.
Frequently Asked Questions

1. Is the MRes in Green Chemistry a taught or a research masters programme?

The course consists principally of research (75%) with a mixture of core and optional lecture courses on relevant topics making up the remaining 25%. Lectures are not confined to the Chemistry Department but also include ones offered by the Centre for Environmental Policy and the Sustainable Energy Futures course. Research projects commence in January after a proposal has been devised between student and supervisor. The projects can be based in one department or jointly between supervisors in various departments across the University such as Chemistry, Chemical Engineering, Materials, Physics, Biology and Biochemistry.

2. When do I need to choose a supervisor for my research project?

Contact is made between students and supervisors once the course has started. A range of projects will be offered and you will have the chance to talk to those offering projects and your choices will be used to allocate projects in the first term.

3. What reading material related to the course would you recommend?

A good source is the book ‘Green Chemistry: An introductory text’ by Mike Lancaster (RSC paperbacks, ISBN: 0854046208). On the topic of energy, we recommend ‘Without the Hot Air’ by David MacKay, which is available as a free download (consider before printing that the book consists of 370 pages including appendices!) in a number of languages (http://www.withouthotair.com/download.html).

4. What are the career prospects after graduation?

Environmental concerns have never been more prominent on the international stage, making this field of study particularly relevant. Many students (sometimes as many as 70%) follow this course by studying for a PhD while others go on to use what they have learnt in fields related to Green Chemistry.

5. How much are living costs in London?

It is recommended that you budget £14,000 per annum for living costs in London.

6. Is it possible to do a part-time job while attending the course?

The course is full time so we only suggest that, if you wish to work while attending the course, you only take a part-time job at weekends.

7. Can I get help with my English language skills?

Yes, the Centre for Academic English (CAE) offers classes to students who are not native speakers of English and suit their support specifically to the language needs of MRes students. The majority of these courses are free of charge. You will need to register at the link below: http://www3.imperial.ac.uk/academic-english/mres
MRes GUIDANCE FOR WRITING A RESEARCH PROPOSAL

FORMAT OF PROPOSAL:
A research proposal should be clear, concise and not cluttered with technical jargon. Try to convey what it is that is exciting about the research. You need to convince the reader about the value of your project. Provide a convincing case for the originality of your proposal and describe your objectives clearly and succinctly.

Your research proposal should adhere to EPSRC guidelines as far as possible (see: http://www.epsrc.ac.uk/funding/appprev/preparing/Pages/documents.aspx). This means that the proposal should be composed of the main proposal (maximum 6 sides of A4) and a diagrammatic work plan (e.g., Gantt chart) (maximum 1 side of A4):

1. Main proposal. This should comprise:

   Background: Introduce the topic of research and explain its academic and industrial context. Demonstrate a knowledge and understanding of past and current work in the subject area in the UK and abroad.

   Programme and Methodology: Identify the overall aims of the project and the individual measurable objectives against which you would wish the outcome of the work to be assessed. Detail the methodology to be used in pursuit of the research and justify this choice. Explain why the proposed project is of timeliness and novelty. Describe the programme of work, indicating the research to be undertaken and the milestones that can be used to measure its progress.

   Relevance to Beneficiaries: Identify the potential impact of the proposed work. Show who is likely to benefit from the proposed research. If the benefits do not directly relate to wealth creation and/or to improving the quality of life, give details of other beneficiaries and explain their importance; other research workers are legitimate beneficiaries.

   Dissemination and Exploitation: Indicate the proposed dissemination and technology transfer routes and explain how the transfer of knowledge will take place to beneficiaries and the general public.

2. Diagrammatic work plan. This should be a diagrammatic indication of the project plan, for example, a PERT or Gantt chart.

PLAGIARISM
The Department and College take plagiarism very seriously. Do not plagiarise. Cutting and pasting from an article or any another person’s work is plagiarism, even if you cite them (the exception to this is quotations). You must read and comply with the Chemistry Department Policy on Plagiarism: http://www3.imperial.ac.uk/chemistry/teaching/undergraduate/teaching/materials/plagiarism

COVER PAGE FORMAT:
All research proposals must provide the following information on the cover:

- The title
- Your name, course and year (e.g. Tom Jones, MRes Green Chemistry)
- The type of report: e.g. Research Proposal.
- Your examination (candidate) number
- The name of your supervisor(s)
- The place where the work is to be carried out, if not at Imperial
- The date of submission (month and year)
**ASSESSMENT:**
The report will be assessed by your supervisor and an independent assessor (another member of staff) using the criteria shown in the attached guidelines. Where the independent assessor and supervisor disagree about the merit of the report, the report will be returned to the coordinator who will commission further independent assessors and/or arbitrate.

**SUBMISSION DEADLINE:**
An electronic version of the research proposal (word or pdf file) must be submitted to Dr Mike Ray by the specified date and time (see page 2 of this Handbook). An identical electronic (pdf) version must be uploaded onto the **Blackboard** site, both by the stated deadline. This file should be named as follows:

Surname[CIDnumber]prop.pdf

e.g. jones00788951prop.pdf

This pdf electronic copy of your report will be scanned for evidence of plagiarism.

**Late submission will be penalised:** At the discretion of the Course Director, 10% of the awarded mark will be deducted for submission up to 24 h late; an additional 5% will be deducted for each subsequent working day.

**FEEDBACK ON PROPOSAL:**
Once your proposal has been marked by your supervisor and an independent assessor you can ask your supervisor for verbal feedback on its content, structure, presentation etc. Please contact your supervisor directly for this. Bear in mind that he/she will not be able to do this until marking by both assessors is complete.
GUIDANCE FOR THE ASSESSMENT OF RESEARCH PROPOSALS

<table>
<thead>
<tr>
<th>No.</th>
<th>Criterion</th>
<th>Factors</th>
<th>Supervisor</th>
<th>Maximum Marks</th>
<th>Independent Assessor</th>
<th>Maximum Marks</th>
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<td>1</td>
<td>Lit Survey</td>
<td>coverage context</td>
<td>√</td>
<td>25</td>
<td>√</td>
<td>25</td>
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<tr>
<td>2</td>
<td>Understanding of background</td>
<td>Insight, critical analysis</td>
<td>√</td>
<td>25</td>
<td>√</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Planning and assessment of viability</td>
<td>Fallback options, appreciation of risk</td>
<td>√</td>
<td>25</td>
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<tr>
<td>4</td>
<td>Presentation</td>
<td>Structure, clarity, written style, quality of English</td>
<td>√</td>
<td>25</td>
<td>√</td>
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</tbody>
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Total 100 100

DETERMINATION OF FINAL MARKS

For MRes research project proposals:
Supervisors mark for proposal 50%
Independent Assessor's mark for proposal 50%

CRITERIA FOR MARKING APPLIED TO MRes RESEARCH PROPOSALS
(with comparison to degree classification)

Clear Fail (40%):
1) Literature survey (coverage & context) - poor coverage of topic; little evidence of structure.
2) Understanding of background (insight, critical analysis) - very limited grasp of key scientific issues; little evidence of critical analysis.
3) Planning & assessment of viability (fallback options, appreciation of risk) - very limited concept of scope of project; no fallback options indicated.
4) Presentation (structure, clarity, written style, quality of English) - minimal organisation of material; difficult to follow; unclear; poor English.

Fail/Merit Borderline (50%):
1) Literature survey (coverage & context) - acceptable coverage; somewhat illogical composition.
2) Understanding of background (insight, critical analysis) - some comprehension of scientific issues; attempts to apply reason-based analysis.
3) Planning & assessment of viability (fallback options, appreciation of risk) - basic scope of project adumbrated; some indications of priority and fallback avenues.
4) Presentation (structure, clarity, written style, quality of English) - apparent structure into sections; English acceptable; some text to scheme links.

Pass/Merit Borderline (60%):
1) Literature survey (coverage & context) - good coverage; logical selection of literature citations.
2) Understanding of background (insight, critical analysis) - appreciation of key issue; some insight and analysis into key aspects.
3) Planning & assessment of viability (fallback options, appreciation of risk) - coherent picture of scope of project conveyed; priorities and fallbacks alluded to.
4) Presentation (structure, clarity, written style, quality of English) - English good; clear organisation of material into logical section; Good, clear style.

Merit/Distinction Borderline (70%):

MRes in Green Chemistry 2016-17
1) **Literature survey (coverage & context)** - comprehensive coverage; carefully chosen & evaluated references.
2) **Understanding of background (insight, critical analysis)** - clear awareness of scientific background; logical and insightful analysis.
3) **Planning & assessment of viability (fallback options, appreciation of risk)** - clear description of project scope; objectives prioritised and fallbacks clearly identified.
4) **Presentation (structure, clarity, written style, quality of English)** - essentially error free; clear logical construction; balanced presentation of message.

**Clear Distinction (~85%)**:

1) **Literature survey (coverage & context)** - highly accomplished précis of subject area; publishable quality.
2) **Understanding of background (insight, critical analysis)** - lucid presentation of complex ideas; mature, critical analysis.
3) **Planning & assessment of viability (fallback options, appreciation of risk)** - Research Council quality planning; clear, concise, reasoned and justified.
4) **Presentation (structure, clarity, written style, quality of English)** - flawless English; clear, logical structure; engaging style; clear developed message.
MRes GUIDANCE FOR JOURNAL CLUB

All MRes Green Chemistry students are required to attend all Journal Club sessions (a register will be taken) as the marks will count towards your final degree grade. Two weeks before each session a primary research paper will be circulated.

The presenting group will present for a strict maximum of 15 mins, with up to 20 minutes questions to follow; you do not have to use the full time allotted, but each group member is expected to present a roughly equal proportion of the material. The grouping of students is random apart from the inclusion of a native English speaker in each group. Please let us know as soon as possible if there is any problem with the groupings as given.

Both groups will be expected to have read the paper on which the session is based. One group presents and the other is expected to prepare some questions in advance and lead the Q&A session. Those questioning will be marked on their questioning as a group. The more effort you make collectively, the better your mark will be. It is your responsibility to ensure that all group members contribute. If major conflicts arise, contact the Course Director.

In addition to the key content of the paper (results, methods, etc.) you are expected to present the background and put the paper into context in its field (e.g. unique features, advance on previous work, competing techniques, conflicting data, papers that have cited the paper since it was published, etc.), as well as critically assess the conclusions and data. You must present the paper at a level suited to the MRes cohort as a whole.

To give an example of the potential scope, a presentation from another MRes course will be provided along with the paper on which it is based. However, you are encouraged to use whatever format you feel is most appropriate.

Your performance will be assessed by the Course Director present and one other academic at the session and counts towards your final MRes mark. Each person presenting will be assessed (equal weighting) by the two members of staff present on presentation (e.g. slides, delivery, timekeeping), science (e.g. pitched at an appropriate level, awareness of context), integration (e.g. evidence of teamwork, organisation, even division of material between the group) and critical analysis (e.g., how well the claims are assessed and probed).

Some additional advice based on where people have wanted to improve in previous years:

Speak up during your talk, and during questions & answers – everyone in the room must be able to hear. Ask audience to repeat a question if it is not loud enough for the whole audience to hear (or repeat it yourself for the whole audience) before you answer.

Consider unconventional ways to present the paper: you don’t have to allocate each person to a separate section of intro, results, discussion, and you can present results in a different order from the paper. Consider breaking the paper into two or three related themes that build on each other, so that each person can provide an intro, results & discussion part to their respective theme. Be as creative as you wish in order to entertain your audience!

Avoid a dry summary of data – the Journal Club is all about interpretation and clear presentation. You should be discussing the results as you go along, each result should be introduced with the reason behind the experiment, explanation/interpretation of the data, and a summary of what the data mean for the paper (and perhaps the field as a whole).

Avoid text-heavy slides; practise your talk so that you can present large clear images uncluttered by blocks of text, and use your voice to provide the context.

Do the work of interpretation for your audience, don’t make them struggle to interpret the raw data from scratch! Create your own figures where possible to provide optimal interpretation for your audience. Figures directly from a paper are designed to be studied at leisure, but the slides in a talk may only be visible for a minute or two, so you usually need to simplify and focus the information.
FORMAT OF THE RENEWABLE ENERGY POSTER:
The format of the poster is up to you. It must be A0 size and can be printed in the Department. In all cases, your posters should:

- be a clear and concise summary of your findings.
- be aesthetically pleasing: i.e. constructed thoughtfully with subtle but pertinent use of colour etc.
- be prepared with a font that is readable from at least 2-3 meters away (i.e. > 24 point, preferably sans-serif: e.g. Helvetica or Arial).
- have a clear title and display your name and that of your partner.
- occupy no more than the area of an A1 page.
- allow the reader to follow readily which parts of the poster follow on from others. Use of arrows and/or numbers for panels will aid this.

Be imaginative! There will be prizes for the best poster.

The Renewable Energy Poster must be brought to the poster session. An identical electronic (pdf) version must be e-mailed to Dr Mike Ray beforehand and the same file must be uploaded onto the Blackboard site, both by the stated deadline. This file should be named as follows:

Surname[CIDnumber]pos.pdf

e.g. jones00788951pos.pdf

This pdf electronic copy of your report will be scanned for evidence of plagiarism.

Late submission will be penalised: At the discretion of the Course Director, 10% of the awarded mark will be deducted for submission up to 24 hr late; an additional 5% will be deducted for each subsequent working day.
MRes GUIDANCE FOR CARRYING OUT A RESEARCH PROJECT, WRITING A DISSERTATION & MAKING AN ORAL PRESENTATION

CARRYING OUT THE PROJECT:
The lab-based research project should be carried out in collaboration with your designated research supervisor. The laboratory work will be carried out in a lab designated by your supervisor. You are expected to work in your supervisor’s lab during normal working hours (9 am – 5 pm) whenever you do not have lectures and allowing of course for a one hour lunch break. The project lasts from the first week of the Autumn term to mid-September in the Summer term. Holidays/revision breaks are arranged with your Supervisor.

Throughout the project, you should meet regularly with your supervisor to update him/her on what progress you are making. If you are having problems or difficulties with the work you should let your supervisor know as soon as possible. If for some reason you are unable or unhappy about doing this please contact the Director of the Green Chemistry programme or the Director of Postgraduate Studies.

Safety: You MUST attend a lab safety talk prior to starting laboratory work and abide by the Departmental safety procedures at all times. See: http://www3.imperial.ac.uk/chemistry/safety.

Lab book and primary data retention: During the course of your project you must keep a dated lab book in which details of all the experiments/investigations you carry out. This lab book is the property of the Department and must be retained by your supervisor once the project has finished. Additionally, you will generate primary spectroscopic and computational data from various instruments/systems that relate to your findings (e.g. spectroscopic data, computational output etc.). This primary data, in whatever form (electronic or paper etc.) is also the property of the Department and must be given to your supervisor once the project has finished. It is your responsibility to ensure that happens. This is of paramount importance as this will be required as evidence in the event that it is necessary to check the validity of the data reported.

FORMAT OF THE DISSERTATION:
Your Dissertation should be written in an accepted RSC style (i.e. Dalton, Faraday or Org. Biomol. Chem.). Start with Introduction and Aims and Objectives sections setting out why you are doing the work, i.e., why it is important, what you were expecting to achieve at the outset, and referring to any relevant publications. These are followed by Results and Discussion and Experimental sections - the order varies with the style. The References come at the end.

The length should be no more than 60-80 pages (A4 typed; 1.5 or double spaced) and may well be shorter than this as the scientific approach is to be concise.

The Results and Discussion chapter presents your experimental results, including the things that didn't work as well as those that did - this is important, as it allows the markers to judge how much you did during your time. Remember that much scientific research is unsuccessful! The discussion should explain the significance of your results and suggest avenues of future research. The Experimental chapter describes concisely the experimental techniques and procedures you used. It is not necessary to describe standard techniques in detail, but you should mention any special techniques, precautions or difficulties. When you have finished, write an Abstract of not more than one page - this goes at the front of your report.

Your research supervisor should be able to help you with the format of your report - it is important not to leave writing up too late so that he/she can see the first part in draft. Another reason for starting to write-up well before the deadline is that you may well think of a finishing touch that would round off your experimental work. It is the content rather than the number of pages that counts.

COVER PAGE FORMAT:
All Dissertations must provide the following information on the cover:

- The title
- Your name, course and year (e.g. Tom Jones, MRes Green Chemistry)
- The type of report: e.g. Dissertation
- Your examination (candidate) number
- The name of your supervisor
- The place where the work was carried out, if not at Imperial
- The date of submission (month and year)

SUBMISSION DEADLINE:
MRes in Green Chemistry 2016-17
An electronic version of the thesis (word or pdf file) must be submitted to Dr Mike Ray by the specified date and time (see page 2 of this Handbook). An identical electronic (pdf) version must be uploaded onto the Blackboard site, both by the stated deadline. This file should be named as follows:

Surname[CIDnumber]res.pdf

e.g. jones00788951res.pdf

This pdf electronic copy of your report will be scanned for evidence of plagiarism.

**Late submission will be penalised:** At the discretion of the Course Director, 10% of the awarded mark will be deducted for submission up to 24 hrs late; an additional 5% will be deducted for each subsequent day.

The presentations must be prepared in time for the appropriate MRes Green Chemistry Presentation Day. Failure to show up will result in zero marks being assigned.

All MRes students making presentations MUST attend the ENTIRE Presentation Day.

A viva will also be conducted on the research work carried out. Failure to attend will result in zero marks. It is the students responsibility to arrange the time, date and venue of the viva with your supervisors and independent marker.

**FORMAT OF THE ORAL PRESENTATION:**

Discuss the format of this with your supervisor and preferably have a number of practice sessions prior to the Departmental presentation. In all cases, your talk should:

- be a clear and concise summary of your research.
- provide a non-specialist audience with sufficient background information to place your research contribution in perspective.
- be prepared using power point or similar presentation software using a font that is easily readable in a lecture theatre (i.e. > 14 point, preferably sans-serif; e.g. Helvetica or Arial).
- start with a slide displaying clearly your project title, your name & your supervisor’s name as well as the College Logo.
- last no more than 12 min to allow 3 min for questions.

Be imaginative! There will be prizes for best presentations.

An identical electronic (pdf) version of the presentation must be uploaded onto Blackboard Learn by the stated deadline. This file should be named as follows:

surname(CID number)talk.pdf

e.g. jones(00258951)talk.pdf

This pdf electronic copy of your report will be scanned for evidence of plagiarism.

**Late submission will be penalised:** At the discretion of the Course Director, 20% of the awarded mark will be deducted for submission up to 24 hr late; an additional 5% will be deducted for each subsequent day.

**ASSESSMENT:**

Assessment of this assignment has four components:

1. Your performance in carrying out the research project – this is assessed by your research supervisor using the criteria shown in the attached guidelines.
2. Your Dissertation – this is assessed by your supervisor and an independent member of staff using the criteria shown in the attached guidelines. Where the independent assessor and supervisors disagree about the merit of the dissertation, it will be returned to the Course Director who will commission further independent assessors and/or arbitrate.
3. Your research presentation – this is assessed by a panel of staff (excluding your supervisor) at the Green Chemistry Presentation Day.
4. Your performance in discussing your research work in the Viva.

For the division of marks between these categories, see the guidelines below.
GUIDANCE FOR THE ASSESSMENT OF RESEARCH PERFORMANCE

These criteria should be combined with the definitions of degree classification given overleaf in making an assessment of the students’ performance. This will make up 20% of the overall dissertation mark.

<table>
<thead>
<tr>
<th>No.</th>
<th>Criterion</th>
<th>Factors</th>
<th>Supervisor</th>
<th>Maximum Marks</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>skill</td>
<td>technical competence</td>
<td>√</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>originality</td>
<td>independence, initiative</td>
<td>√</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>productivity &amp; achievement</td>
<td>output, time management</td>
<td>√</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>commitment</td>
<td>diligence, motivation</td>
<td>√</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>record keeping</td>
<td>Clarity, accuracy</td>
<td>√</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

Total: Supervisor 100

GUIDANCE FOR THE ASSESSMENT OF DISSERTATION

These criteria should be combined with the definitions of degree classification given overleaf in making an assessment of the report. This will make up 80% of the overall dissertation mark with 40% coming from the Supervisors' mark and 40% from the Independent Assessor’s mark.

<table>
<thead>
<tr>
<th>No.</th>
<th>Criterion</th>
<th>Factors</th>
<th>Supervisor</th>
<th>Maximum Marks</th>
<th>%</th>
<th>Independent Assessor</th>
<th>Maximum Marks</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>background &amp; introduction</td>
<td>quality of coverage &amp; context</td>
<td>√</td>
<td>20</td>
<td>√</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>understanding &amp; analysis</td>
<td>scientific awareness, justification</td>
<td>√</td>
<td>30</td>
<td>√</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>quality of experimental</td>
<td>volume &amp; accuracy</td>
<td>√</td>
<td>30</td>
<td>√</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>presentation</td>
<td>structure, clarity, written style, quality of English</td>
<td>√</td>
<td>20</td>
<td>√</td>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total: Supervisor 100 Independent Assessor 100

MRes in Green Chemistry 2016-17
GUIDANCE FOR THE ASSESSMENT OF ORAL PRESENTATION AND VIVA

The criteria for these are based on the same aspects above, however, at the Presentations Day it will be the delivery and presentation of the research rather than the content which will be marked. The Viva seeks to reveal the student’s fundamental understanding of the project, background knowledge and context.

CRITERIA FOR MARKING APPLIED TO FINAL YEAR RESEARCH PROJECTS
(degree classifications provided for comparison)

Clear Fail (40%):

Research Performance:
1) **Skill (technical competence)** - a just passable level of skill; implemented some ideas but misunderstood some.
2) **Originality (independence, initiative)** - did have some ideas but mainly irrelevant and impractical.
3) **Productivity and achievement (output, time management)** - poor attendance; poor time management, minimal progress achieved.
4) **Commitment (diligence, motivation)** - expended minimal effort to progress the project.
5) **Record keeping (clarity, accuracy)** - very poor record of experiments; many critical details not recorded.

Dissertation:
1) **Background and introduction (quality of coverage & context)** - scientific aims and background poorly conveyed; absent key references/concepts.
2) **Understanding and analysis (scientific awareness, justification)** - very limited grasp of key scientific issues; little evidence of critical analysis.
3) **Quality of experimental (volume and accuracy)** - few meaningful results obtained; presentation of data imprecise/ineffective.
4) **Presentation (structure, clarity, written style, quality of English)** - minimal organisation of material; difficult to follow; unclear; poor English.

Fail/Pass Borderline (50%):

Research Performance:
1) **Skill (technical competence)** - competent but required significant help with complex tasks/experiments.
2) **Originality (independence, initiative)** - some ideas which contributed to advancement of the project.
3) **Productivity and achievement (output, time management)** - lacking in commitment; most experiments conducted in a satisfactory fashion.
4) **Commitment (diligence, motivation)** - showed some interest in progressing the project but easily distracted.
5) **Record keeping (clarity, accuracy)** - most necessary experimental details recorded; some ambiguity apparent.

Dissertation:
1) **Background and introduction (quality of coverage & context)** - most scientific aims identified; some confusion relating to prioritisation and relevance.
2) **Understanding and analysis (scientific awareness, justification)** - some comprehension of scientific issues; attempts to apply reason-based analysis.
3) **Quality of experimental (volume and accuracy)** - some useful data; format and presentation non-ideal.
4) **Presentation (structure, clarity, written style, quality of English)** - apparent structure into sections; English acceptable; some text to scheme links.

Pass/Merit Borderline (60%):

Research Performance:
1) **Skill (technical competence)** - able to carry out most techniques; receptive to ideas which were then implemented.
2) **Originality (independence, initiative)** - contributed most ideas to advance the project.
3) **Productivity and achievement (output, time management)** - effective use of time and good number of reliable results.
4) **Commitment (diligence, motivation)** - diligent work pattern; keen to achieve progress.
5) **Record keeping (clarity, accuracy)** - sufficient details recorded to allow repetition; some non-optimal formatting.

Dissertation:
1) **Background and introduction (quality of coverage & context)** - coherent narrative; style slightly derivative; almost all aims adumbrated.
2) Understanding and analysis (scientific awareness, justification) - appreciation of scientific challenges; reasoned justification of strategic decisions taken.
3) Quality of experimental (volume and accuracy) - useful data collected; most important details documented; some inconsistencies.
4) Presentation (structure, clarity, written style, quality of English) - English good; clear organisation of material into logical section; Good, clear style.

Merit/Distinction Borderline (70%):

Research Performance:
1) Skill (technical competence) - very good skills from outset.
2) Originality (independence, initiative) - required minimal assistance; high level of critical judgement
3) Productivity and achievement (output, time management) - a substantial volume of results generated.
4) Commitment (diligence, motivation) - excellent motivation; voluntarily exceeded expectations.
5) Record keeping (clarity, accuracy) - precise and clear records with all details noted.

Dissertation:
1) Background and introduction (quality of coverage & context) - scientific aims clearly identified; clear comprehension of background; all key refs. cited.
2) Understanding and analysis (scientific awareness, justification) - clear awareness of scientific challenges; logical approach to problem solving.
3) Quality of experimental (volume and accuracy) - good volume of high quality, publishable results; format largely adheres to convention.
4) Presentation (structure, clarity, written style, quality of English) - essentially error free; clear logical construction; balanced presentation of message.

Clear Distinction (~85%):

Research Performance:
1) Skill (technical competence) - excellent technical ability; publishable quality of output.
2) Originality (independence, initiative) - excellent grasp of concepts; innovative lines of enquiry self-generated.
3) Productivity and achievement (output, time management) - excellent productivity and professional level of output.
4) Commitment (diligence, motivation) - tenacious; single minded dedication to advancing the project.
5) Record keeping (clarity, accuracy) - model record keeping including insightful observations and perceptive annotations.

Dissertation:
1) Background and introduction (quality of coverage & context) - clear display of subject mastery; precise, coherent, structured; all key refs. cited.
2) Understanding and analysis (scientific awareness, justification) - lucid presentation of nub of challenges faced; mature, reasoning-based analysis.
3) Quality of experimental (volume and accuracy) - outstanding volume of high quality, publishable results; substantial project progress made.
4) Presentation (structure, clarity, written style, quality of English) - flawless English; clear, logical structure; engaging style; clear developed message.
Imperial College London
Research Student Assessment: MRes Mid-Project Progress Report Form
MRes in Green Chemistry

Student name: 
Project Title: 
Supervisors: 
Date: 

**Evaluation to be completed by the Supervisor** (please circle as appropriate, if starred response please give details/agreed action in space provided)

<table>
<thead>
<tr>
<th>attendance:</th>
<th>Excellent / good / satisfactory / unsatisfactory*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment:</td>
<td>Excellent / good / satisfactory / unsatisfactory*</td>
</tr>
<tr>
<td>Awareness of Literature:</td>
<td>Excellent / good / satisfactory / unsatisfactory*</td>
</tr>
<tr>
<td>Presentation skills (written and oral):</td>
<td>Excellent / good / satisfactory / unsatisfactory*</td>
</tr>
<tr>
<td>Overall Progress:</td>
<td>Excellent / good / satisfactory / unsatisfactory*</td>
</tr>
</tbody>
</table>

**Supervisor’s comments on project progress to date. Please highlight any successes and problems and comment on the agreed targets for the second half of the project (please continue overleaf if required).**

**Student’s General Comments, including identification of any issues which need to be addressed** (please continue overleaf if required).

Student’s signature ................................. Date .............................
Supervisor’s signature ............................. Date .............................
Imperial College London
MRes Mid-Project Progress Report Form - Student Evaluation
MRes in Green Chemistry

Name:
Project Title:
Supervisors:
Date:

Evaluation to be completed by the Student *(please circle as appropriate, if starred response please give details/agreed action in space provided)*

Quality of Supervision: Excellent / good / satisfactory / unsatisfactory*
Overall Project Progress to date: Excellent / good / satisfactory / unsatisfactory*

Please highlight successes/problems encountered during the project to date, and detail any changes made to the research plan in light of these. Use this opportunity to identify any issues which need to be addressed in the coming weeks/months.

Student's signature .................................................. Date ...............................
Other useful links

Assessment

• Link to Academic and Examination regulations:
  http://www3.imperial.ac.uk/registry/proceduresandregulations/regulations

• Link to religious obligations in assessments:
  https://workspace.imperial.ac.uk/registry/Public/Exams/Exams%20and%20religious%20obligations.pdf

Procedures

• The College’s Regulations for Students:
  http://www3.imperial.ac.uk/registry/proceduresandregulations

• Mitigation / extenuating circumstances policy and procedures:
  http://www3.imperial.ac.uk/registry/proceduresandregulations/policiesandprocedures/examinationassessment

• Complaints and Appeals procedures:
  http://www3.imperial.ac.uk/registry/proceduresandregulations/policiesandprocedures/complaintsappeals

• Academic integrity:
  https://workspace.imperial.ac.uk/registry/Public/Procedures%20and%20Regulations/Policies%20and%20Procedures/Examination%20and%20Assessment%20Academic%20Integrity.pdf

• Cheating offences policy and procedures:
  http://www3.imperial.ac.uk/registry/proceduresandregulations/policiesandprocedures/disciplinary

Employment

• Link to the Policy on employment during studies:

Welfare and Support

• Information for students with disabilities, including the Disability Advisory Service:
  http://www3.imperial.ac.uk/disabilityadvisoryservice

• Other welfare and pastoral care /support resources both Departmental and College-wide (e.g. College Tutors, Dean of Students, Counselling Service, Health Centre, NHS Dentist, Student Hub, Chaplaincy, support for International Students inc. ELSP):
  http://www3.imperial.ac.uk/humanities/englishlanguagesupport
  http://www3.imperial.ac.uk/students/welfareandadvice
  http://www3.imperial.ac.uk/students/international

• Information about the Library:
  http://www3.imperial.ac.uk/library

• Student representation – how to become a student representative:
  https://www.imperialcollegeunion.org/representation

MRes in Green Chemistry 2016-17
Details of Departmental/College Committees, including Staff-Student Committees. (The College’s Staff-Student Committee Good Practice Guidelines are available at: http://www3.imperial.ac.uk/registry/proceduresandregulations/qualityassurance/goodpractice)

Other support services (e.g. Registry, Careers Advisory Service): http://www.imperial.ac.uk/registry http://www.imperial.ac.uk/careers

Imperial College London, South Kensington campus

It is suggested that you use the tunnel connecting South Kensington Underground station with Imperial College Road. After coming through the ticket barriers in the station, turn right (do not go to street level) and walk (follow the tunnel to the very end (5 mins). Ascend the stairs at the end and turn left where you will find the start of Imperial College Road.

Buildings where wheelchair access is not possible at this time

1. Belt Quadrangle
2. Imperial College Union
3. College House
4. Ethos Sports Centre
5. Student Accommodation Office
6. Weiss Hall
7. Blackett Laboratory
8. Roderic Hill Building
9. Bone Building
10. Royal School of Mines
11. Aston Webb
12. Bessmer Building
13. Goldsmiths Building
14. Health Centre, Dentist
15. Hooley Building
16. A.C.E. Extension
17. William Penney Laboratory
18. Electrical Engineering
19. Tennek Business School
20. 53 Prince’s Gate
21. Lister Hall
22. Sheffield Building
23. Faculty Building
24. SB Prince’s Gate
25. Conference Link
26. 170 Queen’s Gate
27. Imperial College and Science Museum Libraries
28. Queen’s Tower
29. St John’s Building
30. Mechanical Engineering Building
31. Institute for Mathematical Sciences
32. Southside (under construction)
33. Biochemistry Building
34. Flowers Building
35. Chemistry Building
36. Sir Alexander Fleming Building
37. Chemistry RCS