MRes in Nanomaterials

The Department of Chemistry
Imperial College London

Academic Year: 3rd October 2016 – 30th September 2017
Some Important Dates

**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
13.00 – 14.30 Welcome & Introduction to the Course (G47A, Flowers Building)
16.15 – 17.00 Welcome Talk by the President, 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 3 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** Submit Research Proposal:
1) One electronic copy of Research Proposal by email to Dr Mike Ray by email (michael.ray@imperial.ac.uk)
2) One electronic copy of your Research Proposal (as word or pdf format) on Blackboard Virtual Learning Environment

**Monday 9th – Friday 13th January 2017**
Exam Week – Exam dates and times to be confirmed.

**Spring Term 2017**
(Advanced lectures journal club; dates and times to be confirmed)

**April 2017**
Materials Characterisation Exam– Exam date, time and venue to be confirmed.

---

MRes in Nanomaterials 2016/17
Monday 22\textsuperscript{nd} – Friday 26\textsuperscript{th} May 2017
European Materials Research Society (E-MRS) meeting, Strasbourg, France.

Thursday 24\textsuperscript{th} August 2017
Deadline 12.00 (midday) Submit:
1) One electronic copy of Final Research Report by email to Dr. Mike Ray by email (michael.ray@imperial.ac.uk)
2) One electronic copy of your Final Research Report (as word or pdf format) on \textit{Blackboard Virtual Learning Environment}

Mid-September 2017 (venue to be confirmed)
All day MRes Symposium – project presentations (date and venue to be announced)
Attendance Compulsory

Mid/End of September 2017 (venue to be confirmed)
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 timetable is also available through the Imperial App.

CONTACTS

Those responsible for the general organisation of the course are;

Prof. Nicholas Harrison
Course Director & Chair Board of Examiners
Room B339, Bessemer Building
Ext 45884 nicholas.harrison@imperial.ac.uk

Dr. Saif Haque
Course Co-Director
Room 164b, Level 1, Chemistry Building
Ext 41886 s.a.haque@imperial.ac.uk

Dr. Mike Ray
MRes Programme Coordinator
Room 258, Level 2, Chemistry Building
Ext 50694 michael.ray@imperial.ac.uk
USEFUL WEBSITES
www.mrs.org
www.imperial.ac.uk/chemistry
www.london-nano.com

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
• Details of Departmental/College Committees, including Staff-Student Committees.
  http://www3.imperial.ac.uk/registry/proceduresandregulations/qualityassurance/goodpractice

• Other support services (e.g. Registry, Careers Advisory Service):
  http://www3.imperial.ac.uk/registry
  http://www3.imperial.ac.uk/careers
Course synopsis:

MRes in Nanomaterials

Nanotechnology represents a fundamental change in the way we interact with the natural world, and is set to deliver some of the major scientific and technological advances of the new century. The massive global investment in nanotechnology means that scientists who are trained to work effectively in an interdisciplinary environment – bridging the diverse fields of chemistry, physics, materials science and engineering – will play a vital role in shaping the future.

Combining interdisciplinary teaching with cutting edge research, Imperial College's flagship Masters Degree in Nanomaterials is designed to train the next generation of nanotechnologists. Imperial College is a world class research institution with internationally leading expertise and facilities. Its nanomaterials course is a demanding one and competition for places is intense. Academic excellence and a willingness to work in an interdisciplinary environment are a prerequisite. You will carry out a major year long research project, visit state-of-the-art research laboratories in industry and academia, and discuss their work at a fully funded conference in the USA

Educational aims of the provision

1- Learning outcomes
The programme aims/objectives are to:

- Produce physical sciences postgraduates equipped to pursue careers in nanomaterials science in academia, industry, the public sector and non-governmental organisations;
- Develop the ability to undertake research in multidisciplinary teams at this interface;
- Develop a knowledge of a range of basic and advanced nanomaterials concepts;
- Develop research and analytical skills related to nanomaterials research;
- Develop oral and written scientific presentation skills;
- Attract the most motivated physical sciences graduates, both from the UK and overseas;
- Develop new areas of teaching in response to the advance of scholarship and the needs of vocational training.

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:

1. Core concepts in nanomaterials – semi conductor nanostructures, supramolecular chemistry, optical and electrical properties, nanotubes and computational techniques.
2. Specialised concepts in nanomaterials – molecular nanobiotechnology, colloidal semiconductors, advanced materials characterisation techniques, patterning techniques, photonic and optoelectronic applications, theory modelling and simulation of nanomaterials.
3. Research techniques, including information retrieval, experimental design and statistics, modelling, materials characterisation techniques, and laboratory safety.
4. Detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to the student’s project.
5. Management and communication skills, including problem definition, project design, decision processes, teamwork, written and oral reports, scientific publications.

Teaching/learning methods and strategies
Acquisition of A1 to A5 is through a combination of lectures, seminars, coursework and research. Throughout the course, the students are encouraged to undertake independent reading both to supplement and consolidate what is being taught/learnt and to broaden their individual knowledge and understanding of the subject. Assessment of the knowledge base is through a combination of unseen written examinations, (A1-2), coursework exercises and assessed project work (A3-5).

B) Intellectual skills. To be able to:
   1. Analyse and solve problems in nanomaterials science using an integrated multidisciplinary approach.
   2. Integrate and evaluate information.
   3. Formulate and test hypotheses using appropriate experimental design and analysis of data.
   4. Plan, conduct and write-up a programme of original research.

Teaching/learning methods and strategies
Intellectual skills are developed through the teaching and learning methods outlined above. Experimental design skills are developed in lectures and subsequently in the individual research project. Individual, formative and summative feedback is given to students by the project team. The feedback on the project synopsis / research plan submitted in November provides important summative feedback on student progress. Assessment is through research project plan, unseen written examinations and the individual research project.

C) Practical skills
   1. Plan and execute safely a series of experiments.
   2. Use laboratory–based methods to generate data.
   3. Analyse experimental results and determine their strength and validity.
   4. Prepare technical reports.
   5. Give technical presentations.
   6. Use the scientific literature effectively.
   7. Use computational tools and packages.

Teaching/learning methods and strategies
Practical skills are developed through the teaching and learning programme outlined above. Practical experimental skills (C1 to C3) are developed through project work. Skills C4 and C5 are taught and developed through feedback on reports written and presentations made as part of the coursework assignments. Skill C6 is developed through the project synopsis/research plan, presentation workshops and supervised research project. Skill C7 is taught and developed through project work. Practical skills are assessed through the project synopsis / research plan and the research project dissertation and talk.

D) Transferable skills
   1. Communicate effectively through oral presentations, computer processing and presentations, written reports and scientific publications.
   2. Apply statistical and modelling skills.
   3. Management skills: decision processes, objective criteria, problem definition, project design and evaluation, risk management, teamwork and coordination.
   4. Integrate and evaluate information from a variety of sources.
   5. Transfer techniques and solutions from one discipline to another.
   6. Use information and communications technology.
   7. Manage resources and time.
   8. Learn independently with open-mindedness and critical enquiry.
   9. Learn effectively for the purpose of continuing professional development.

Teaching/learning methods and strategies
Transferable skills are developed through the teaching and learning programme outlined above and in section 11. Skill D1 is taught through coursework and developed through
feedback on assessed reports and oral presentations. Skill D2 is taught through lectures and practical work and developed, as appropriate, during individual research project. Skill D3 is developed in the research team meetings (eg bi-weekly) and by putting together a project synopsis/research plan. Skill D4 is developed through feedback on a research project plan. Skill D5 is a core activity of the research projects and is additionally taught in lectures. Skill D6 is taught in lectures developed through project work and individual learning. Skill D7 is developed throughout the course within a framework of staged coursework deadlines. Although not explicitly taught, skills D8 and D9 are encouraged and developed throughout the course, which is structured and delivered in such a way as to promote this. An example is the student participation in an international research conference during the course.
2 – MRes in Nanomaterials programme structure, features and assessment
The programme is only offered as a full-time, one-year course and leads to the MRes degree. Students begin their lecture programme with core courses mostly in the first term (October-December) and follow this up in second term (January-March) with advanced courses. The core courses are examined in January and the advanced courses are examined in Feb. For skills development, the students are required to make (unassessed) oral presentations on research in the scientific literature. In October students choose a 10 month (November-August) multidisciplinary research project. They present a Research Proposal on the topic of their research in December and a final report and talk on the research in August. The overall pass mark is 50% and the research project and taught elements contribute 60% and 40% to the total mark, respectively; students are required to pass both elements for a successful completion of the course. Students obtaining marks within 2.5% of a grade boundary may be called to viva by the external examiners at their discretion.

2.1 Autumn Term (October-December):
Students choose 3 possible research projects after discussion with academic staff in the first three weeks. They are allocated a project from this selection at the end of October. Under the supervision of their project team they start researching and writing their research proposal, to be submitted in December. Students start their core courses, which cover the following topics, given in 3 lecture modules: (i) Nanomaterials; (ii) Plastic Electronics: from materials chemistry to device applications; (iii) Renewable Energy: from solar cells to fuel cells: the chemistry of sustainable energy.

2.2 Spring Term (January-March):
At the beginning of the second term students are examined on the core lecture courses. Students will by this time already have spent time on their research projects. They will also attend a lab course and assessment on nanomaterials characterisation. The students will attend eight two hour advanced lectures on the following topics:
- Cellular Nanobiotechnology (A. Cass)
- Computer-aided design of porous materials (K. Jelfs)
- Organic electronic Materials (S Haque)
- Nanofluidics (N. Quirke)
- Single Molecule Detection (J. Edel)
- Nanomechanics (F. Giuliani)
- New Tools to measure Microscopic Viscosity (M. Kuimova)
- Design & Synthesis of Semiconducting Polymers (M. Heeney)

2.3 Summer Term (April-September):
Project assessment in September is based on a written dissertation and a scientific talk in early September. Students obtaining marks within 2.5 % of a grade boundary may be called to viva by the external examiners at their discretion.

2.4 Assessment
The assessment rules & degree classification for the programme will be:

- Minimum standards in each element and assessed component will be required with an overall pass mark of 50%.
- To qualify for the award of MRes, students will have to complete all the course requirements and must achieve an overall pass mark in each assessed component. This includes the combined taught elements (written examinations) and research elements (Research Proposal, research project report, project oral presentation) of the course.
- The percentage weighting of marks contributing to the degree are given in the following table:

<table>
<thead>
<tr>
<th>Taught Element</th>
<th>Percentage</th>
<th>Research</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessed Component</td>
<td>(40 %)</td>
<td>weighting of marks contributing to degree</td>
<td>Element (60%)</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>--------</td>
<td>--------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Chemistry Core Courses (Exams)</td>
<td>20 %</td>
<td>Research Proposal</td>
<td>9 %</td>
</tr>
<tr>
<td>Materials Characterisation Course (Course work &amp; Exam)</td>
<td>5 %</td>
<td>Research Project Report</td>
<td>42 %</td>
</tr>
<tr>
<td>Advanced Lectures Journal Club</td>
<td>15 %</td>
<td>Project Oral Presentation</td>
<td>9 %</td>
</tr>
</tbody>
</table>

Summary of grades, marks and their interpretation for the MRes degree classification:

<table>
<thead>
<tr>
<th>GRADE</th>
<th>MARKS</th>
<th>INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distinction</td>
<td>70% - 100%</td>
<td>Marks represent a distinction performance</td>
</tr>
<tr>
<td>Merit</td>
<td>60% - 69.9</td>
<td>Marks represent a merit performance</td>
</tr>
<tr>
<td>Pass</td>
<td>50% - 59.5%</td>
<td>Marks represent a pass</td>
</tr>
<tr>
<td>Fail</td>
<td>0% - 49.9%</td>
<td>Marks represent a fail performance at MRes level</td>
</tr>
</tbody>
</table>

- **Distinction**: to be awarded where a candidate has achieved:
  - either: an aggregate mark of 70 per cent or greater across the programme as a whole, comprising a mark of 70 per cent or greater in each element;
  - or a mark of 70 per cent or greater across the programme as a whole, with a mark of 70 per cent or greater in each element with the exception of one element, for which a mark of 60 per cent or greater must have been obtained.

- **Merit**: to be awarded where a candidate has achieved:
  - either: an aggregate mark of 60 per cent or greater across a programme as a whole, comprising a mark of 60 per cent or greater in each element;
  - or: has obtained a mark of 60 per cent or greater across a programme as a whole, with a mark of 60 per cent or greater in each element with the exception of one element, for which a mark of 50 per cent or greater has been obtained.

- **Pass**: to be awarded where a candidate has achieved an aggregate mark of 50 per cent or greater across a programme as a whole, comprising a mark of 50 per cent or greater in each element.

- **Fail**: to be awarded where a candidate has achieved an aggregate mark of 49.9 per cent or less across a programme as a whole, comprising a mark of 49.9 per cent or less in each element.

At the end of the course an external examiner will assess the examination process. The date of this meeting is **TBC, but all students must be present for this day**. Students that are either at boundaries between grades (i.e. pass/failure or pass/distinction) or have failed one or more components of the course are likely to get an additional oral examination (viva). A prize will be awarded to the highest performing student.

### 3 – Research Components of Course
The major element of the research component of this course is a 10-month long multidisciplinary research project. A Research Proposal will be presented in December, a summary of your research written in the form of a Research Project Report will be submitted in August and a research talk will be given at the MRes nanomaterials symposium shortly after this submission date (see above). All these assessed elements make up the research component of the course (see below for further details of the weighting of these elements).

3.1 Research Proposal (submission deadline: midday, Wednesday 14th December 2016)
A proposal will be written on your chosen research project outlining the aims, background, objectives, impact and work plan for research that you will undertake from January 2016.

The proposal is based upon the format of an EPSRC research grant proposal, and is to be written throughout the first term of the course. It is expected to include a critical review of the literature on the subject matter chosen for the research project.

Your proposal will be marked by both supervisors as well as by one other independent marker. The purpose of the project proposal is to test independent work. The written style, standard of presentation, completeness and analysis of the literature survey, and rationale for the proposed research will be assessed, to ensure an understanding of the aims and objectives of the proposed research.

The Department and College take plagiarism very seriously. Do not plagiarise. You must read and comply with the Chemistry Department Policy on Plagiarism: http://www3.imperial.ac.uk/chemistry/teaching/undergraduateteaching/materials/plagiarism

A copy of the Plagiarism Form (included at the end of this booklet) should be submitted with your Research Proposal.

Students are required to submit the following by the specified deadline:
1) One electronic copy (pdf) of your Research Proposal by email to the MRes programme coordinator Dr. Mike Ray (michael.ray@imperial.ac.uk)
2) One electronic copy of your Research Proposal (as word document format) uploaded to Blackboard Virtual Learning Environment

Failure to do so will result in a penalty. 5% of the awarded mark will be deducted for each day of delay.

3.2 Research Project Report (submission deadline: 2pm, Thursday 25th August 2017)
The research project report should be a succinct, but complete account of your achievements up to a maximum of 60 pages in length. Your report should follow the guidelines laid out below:

- Introduction
  - Place your research in the context of the current state of the art.
  - Identify the significant advance(s) in knowledge you are aiming for.

- Methodology
  - Explain and justify the approach you have chosen.
  - Ensure that your work can be repeated.

- Results/Discussion
  - Summarise your key results.
  - Discuss your results in the context of previous work.
  - Identify the advances in methodology and knowledge that have been made.

- Conclusions & Future Work
  - Summarise your key findings.
o Outline the next steps to extend or exploit your research.

The research project reports will be marked by both supervisors as well as by one other independent marker, moderated by the course directors. The purpose of the project proposal is to test independent work. The written style, standard of presentation, completeness of literature survey and analysis of literature are assessed. The rationale for the proposed research will also be marked, to ensure an understanding of the aims and objectives of the proposed research.

The Department and College take plagiarism very seriously. Do not plagiarise. You must read and comply with the Chemistry Department Policy on Plagiarism: http://www3.imperial.ac.uk/chemistry/teaching/undergraduateteaching/materials/plagiarism

A copy of the Plagiarism Form (included at the end of this booklet) should be submitted with your Research Proposal.

Students are required to submit the following by the specified deadline:

1) One electronic copy (pdf) of manuscript by email to the MRes programme coordinator Dr. Mike Ray (michael.ray@imperial.ac.uk)
2) One electronic copy of your manuscript (word format) on Blackboard Virtual Learning Environment (instructions on how to upload are given towards the end of this booklet)

Failure to do so will result in a penalty. 5% of the awarded mark will be deducted for each day of delay.

3.3 Oral presentation at MRes symposium (September 2017, date TBC)
The oral presentation will further test understanding of the research undertaken. The MRes symposium is a meeting for all the students attending the MRes in nanomaterials, MRes in Green Chemistry and MRes in Catalysis. It provides an opportunity to present the work carried out during the research project (in the form of a 12 minute presentation with 3 minutes for questions), and also the opportunity to hear about research carried out by your fellow cohort.

4 – Taught Components of Course
4.1 – Core Lectures
I-S2 Nanomaterials (12 Lectures, Prof. Milo Shaffer, Prof. Nic Harrison and Prof. James Durrant, Term 1).

I-S6 Plastic Electronics: from materials chemistry to device applications (12 Lectures, Prof. Martin Heeney, Prof. Iain McCulloch, Dr Saif Haque, Prof. John de Mello and Prof. James Durrant, Term 1).

I-S7 Renewable Energy: from solar cells to fuel cells: the chemistry of sustainable energy (12 Lectures, Prof. Anthony Kucernak & Prof. James Durrant, Term 1).

And..

Materials Characterisation (MSE 302) Materials Department
24 lectures
Dr. Stephen Skinner, Dr. Michelle Moram, Mr. Richard Chater and Mr. Richard Sweeney
This course is designed to give students a firm foundation in the fundamentals of Materials Characterisation required in particular for their research project. The mission of Materials Characterisation is to explain the use of advanced techniques for the study of structure-property relationships in materials. The course builds on the basic knowledge of materials chemistry and physics and details the theory and practical application of key techniques:
4.2 – Advanced Lectures Journal Club

- Cellular Nanobiotechnology (A. Cass)
- Computer-aided design of porous materials (K. Jelfs)
- Organic electronic Materials (S Haque)
- Nanofluidics (N. Quirke)
- Single Molecule Detection (J. Edel)
- Nanomechanics (F. Giuliani)
- New Tools to measure Microscopic Viscosity (M. Kuimova)
- Design & Synthesis of Semiconducting Polymers (M. Heeney)
- Dr Piers Barnes

This lecture course is taught in the Spring term and is assessed by the advanced Journal Club which will take place in March 2017. The students would be divided into groups of 3 and provided with a seminal high impact paper from the advanced lectures and expected to work together as a group and produce a presentation no longer than 30 mins, with up to 10 mins questions to follow. Each group member is expected to present a roughly equal proportion of the material. You will be expected to read all papers in advance of the session regardless of whether you are presenting or not. As one group presents, another is expected to prepare some questions in advance and lead the Q&A session.

In addition to the key content of the paper (results, methods, etc.) you will be 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.

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. You will be assessed on:

- **Presentation**: organisation of material, quality of slides, delivery, keeping to time.
- **Science**: Selection of material, clarity of explanation at a level that can be understood by the MRes student audience, insight into the paper and evidence of reading around the subject.
- **Integration**: flow and complementarity to other sections of the presentation delivered by the other group members.
- **Questions**: this mark is awarded to the presenting group as a whole according to how well questions from the audience are answered.

5 – Additional compulsory, non-assessed components of the course:

5.1 Monthly Project Meetings (Throughout the year, Nov 2016 – July 2017)

The whole cohort will be expected to gather once a month for brief oral reports and discussion of the research projects. These meetings are designed to be informal allowing all of you to share your experiences. One of the course directors will usually be in attendance.

5.2 External Examiners Meeting (Wednesday 22nd September 2017)

Important: You may be called to a viva by the external examiners on the day of the external examiners meeting (exact date to be arranged) so you must be in college on this day.

5.3 Research seminars and colloquia (Throughout the year, Oct 2016 – Jul 2017)

Regular research seminars given by leaders in particular fields are organised by the Chemistry department, and attendance is expected. Details will be sent via email.

6 – Professional Development for Master’s students
6.1 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

6.2 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

From October 2012 courses will also be run at the St Mary’s Campus, and will be reviewed in order to incorporate sufficient emphasis on Personal Effectiveness, Networking and Verbal Communication.

6.3 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.

6.4 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.

Students are strongly encouraged to take transferable skills courses given by the Graduate School at Imperial College London. For more information on the courses available please see: http://www3.imperial.ac.uk/gseps/transferableskillscourses
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.registrystorage@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://www3.imperial.ac.uk/chemistry/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:

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Email</th>
<th>Phone</th>
</tr>
</thead>
<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 Supervisor</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 Specialist</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>
</tr>
</tbody>
</table>
When in laboratories you are expected to apply **Safe Lab Practice** as described below:

<table>
<thead>
<tr>
<th>Preparation for lab work</th>
<th>DON'T:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DO:</strong></td>
<td><strong>DON’T:</strong></td>
</tr>
<tr>
<td>• Wear clothing which minimises potential for skin exposure</td>
<td>• Wear clothing that is loose enough to drag over bench or floor surfaces</td>
</tr>
<tr>
<td>• Remove dangling jewellery and items that can get contaminated or caught in equipment</td>
<td>• Wear clothing you care about</td>
</tr>
<tr>
<td>• Wear sensible shoes which cover your feet completely</td>
<td>• Wear expensive jewellery as it may get tarnished if it comes into contact with chemicals</td>
</tr>
<tr>
<td>• Tie back long or loose hair</td>
<td>• Wear sandals or lip flops or similar in the lab</td>
</tr>
<tr>
<td></td>
<td>• Wear contact lenses, use prescription glasses with safety glasses or prescription safety glasses</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General rules when working in the lab</th>
<th>DON’T:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DO:</strong></td>
<td><strong>DON’T:</strong></td>
</tr>
<tr>
<td>• Ensure personal items are stored outside of the laboratory or in the containers provided</td>
<td>• Leave any personal items on lab benches or outside of the containers</td>
</tr>
<tr>
<td>• Check the safety signs on lab entry doors to identify the personal protective equipment required</td>
<td>• Eat, drink, smoke or apply cosmetics in the laboratory</td>
</tr>
<tr>
<td>• Cover cuts or abrasions on the hands with suitable water resistant covering</td>
<td>• 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.</td>
</tr>
<tr>
<td>• Change your lab coat if it gets contaminated or dirty</td>
<td>• Chew pens or pencils, rub the eyes or face with gloved hands.</td>
</tr>
<tr>
<td>• Wash your hands before leaving the laboratory</td>
<td>• Use mobile phones in the laboratory.</td>
</tr>
<tr>
<td>• Maintain clear passages to lab exits</td>
<td>• Wear any equipment that will interfere with hearing audible alarms.</td>
</tr>
<tr>
<td>• Ensure waste bins are emptied regularly</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Housekeeping</th>
<th>DON’T:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DO:</strong></td>
<td><strong>DON’T:</strong></td>
</tr>
<tr>
<td>• Keep your lab workspace in a tidy state and wipe down lab benches and other work surfaces after use.</td>
<td>• Leave any sharps (needles, scalpels etc) exposed on work surfaces</td>
</tr>
<tr>
<td>• Clear up spillages in the lab and inform others working in the area of the spill.</td>
<td>• Reuse disposable lab gloves</td>
</tr>
<tr>
<td>• Know the locations of the emergency showers and exits.</td>
<td>• Leave experiments unattended without suitable label including name, date, hazards and your emergency contact number</td>
</tr>
<tr>
<td>• Dispose of used consumables and waste in the appropriate waste bin.</td>
<td>• Ignore warning alarms associated with equipment</td>
</tr>
</tbody>
</table>

**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:

Salus can be accessed via the Department safety web pages: [http://www3.imperial.ac.uk/chemistry/safety](http://www3.imperial.ac.uk/chemistry/safety) or via the college Safety Dept. Web pages: [http://www3.imperial.ac.uk/safety](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](http://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. 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](http://www3.imperial.ac.uk/portal/pls/portallive/docs/1/7289138.pdf)
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 bursary is for a full-time employment up to the end of September 2017. **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 2017, March – May 2017.**

It is mandatory to attend all scheduled lectures, seminars, courses and exams. Missing an exam without any support by a doctor’s notice 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 will be assigned to a personal tutor, who should be the first contact in all matters concerning problems with the supervision of the projects or other pastoral difficulties. The administrator of the MRes course, Dr. Mike Ray, will be the point of contact for all administrative or logistic issues. Once these channels have been exhausted matters should be raised with the MRes course directors, Prof. Nicholas Harrison and Dr. Saif Haque.

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 should have at least two project supervisors. Both supervisors should be approached for guidance. It is the students’ 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 all assessed components of the course. This includes the written exams, the literature report & project plan, the final research project report and the oral presentation. Failing in one of the components could lead to a failure of the whole course.

At the end of the course an external examiner will assess the examinations process. All students have to be present for this day. Students that are either at boundaries between marks (i.e. pass/failure or merit/distinction) or have failed one or more components of the course are likely to get an additional oral examination (viva) that will determine their final mark.

Students should seek guidance with respect to their research project report and literature report & project plan from their corresponding supervisors, since they will be involved in the marking. After completion of the literature report & project plan students should seek feedback from their corresponding supervisors to foster the improvement of their final research project report.

Students are required to submit an electronic version of the final report to their supervisors. Additionally, they must hand over all notes, lab-books, results, computer programmes etc to their supervisors.
The assessment will take into consideration the teaching of the subject and the type of problems and tasks set. Allowance is made for what is reasonably achievable under examination conditions.

<table>
<thead>
<tr>
<th>Percentage Grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>85-100</td>
<td><strong>Exceptional.</strong> Originality, critical/analytical ability ** and evidence of outside reading is expected. The presentation of the subject combines conciseness and exemplary understanding of all relevant concepts and facts.</td>
</tr>
<tr>
<td>70-84</td>
<td><strong>Excellent.</strong> As for Exceptional, but not fully achieving one of them.</td>
</tr>
<tr>
<td>60-69</td>
<td><strong>Very Good.</strong> Provides a clear and accurate account of the relevant knowledge, concepts and facts. Evidence of some outside reading and critical/analytical ability **.</td>
</tr>
<tr>
<td>55-59</td>
<td><strong>Good.</strong> Provides a mainly accurate account of the basic concepts covering at least half of the relevant taught material, but is marred by significant errors.</td>
</tr>
<tr>
<td>50-54</td>
<td><strong>Adequate.</strong> Provides only a minimal account of the basic concepts covering at least a third of the relevant taught material, but is marred by major errors.</td>
</tr>
<tr>
<td>35-49</td>
<td><strong>Unsatisfactory.</strong> Provides only a vague account covering less than a third of the relevant taught material and indicates a confused understanding of the subject.</td>
</tr>
<tr>
<td>20-34</td>
<td>Provides only a vague understanding of some concepts and facts covering about a quarter of the expected material. Presentation is dominated by inaccurate or irrelevant material.</td>
</tr>
<tr>
<td>10-19</td>
<td>A maximum of three relevant facts (sentences) are presented.</td>
</tr>
<tr>
<td>1-9</td>
<td>Answer includes at most one relevant fact (sentence)</td>
</tr>
<tr>
<td>0</td>
<td>Answer contains nothing correct that is relevant to question. Mark to be given where the work is discovered not to be that of the candidate (plagiarised). Further disciplinary action is usually taken in cases of plagiarism.</td>
</tr>
</tbody>
</table>

**Analytical** = assessing a hypothesis or statement by breaking it down into its elements and examining their inter-relationships and contribution to the whole; cf. **Critical** = judging a hypothesis or conclusion by examining the validity of the evidence adduced for it.
Guidelines for Marking MRes Research Proposal

The following should be submitted on or before 12.00 Wednesday 14th December 2016:

1) One electronic copy (pdf) of the Research Proposal by email to the MRes programme coordinator Dr. Mike Ray (michael.ray@imperial.ac.uk)

2) One electronic copy of your Research Proposal (as word document format) on Blackboard Virtual Learning Environment (instructions on how to upload are given later in this booklet)

The purpose of the project proposal is largely to test the students’ ability to conceive and design the necessary steps for their research project, which will be undertaken throughout the second half of the MRes course. It is essential that a good understanding of relevant state-of-the-art research is demonstrated, and the aims and objectives of the proposed research programme should be defined.

Your MRes proposal (maximum 8 pages including figures, references, etc) must adhere to the following format:

Background (maximum 5 pages): Introduce the topic of research and explain its academic and industrial context; review the literature necessary for the understanding of the project aims and methodology employed. Demonstrate a knowledge and understanding of past and current work in the subject area in the UK and abroad. Include any preliminary work here, if it is necessary for formulating the aims and objectives of the programme of work covered in the following section

Programme and Methodology (2 pages maximum): State 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 the 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 (relate to diagrammatic workplan).

Relevance to Beneficiaries; potential impact (0.5 page maximum): Identify the potential impact of the proposed work. Indicate 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; (note that other research workers are legitimate beneficiaries).

Diagrammatic work plan (maximum 0.5 page). This should be a diagrammatic indication of the project plan, for example, a PERT or Gantt chart.

Proposals should have a minimum of 2,000 words and not exceed 8 word-processed pages including figures and references. The proposal must be written using the font Arial (11pt), 1.5 lines spacing, with document margins of 1.5 cm at the top, bottom, left and right. The report should include the title, your name and your supervisors name in the header of the word document. It is advisable to maximise the use of space by being selective about the figures needed for the proposal as well as listing publications as footnotes. The font size for header and footer can be 10pt.
Assessment of MRes proposals

Proposals will be marked independently by the biological supervisor, the physical supervisor and the independent marker. The proposal will then be moderated.

When writing the following marking criteria should be borne in mind.

Written style/Presentation
- Is the proposal well written and presented (typewritten, bound, organisational figures, formatting etc) and clearly explained?
- The proposal should be concise and complete (thorough and informative)
- Are the references listed actually referred to or discussed in the text? Is the project the candidate’s own work, written in their own words?
- Is the format up to the standards expected from grant proposals to research councils?

Background information
- Is the literature survey thorough and complete?
- Are important references missing?
- Are all relevant subjects (biological context & physical/technical aspects) sufficiently covered?
- A mechanical copy of existing material is not acceptable.

Programme and methodology
- The programme should be concise and logical.
- Is the proposed work’s relationship to other work in the literature clear?
- Aims and methodology should be clearly justified.
- Is the choice of methodology clear and is it justified?
- Is the diagrammatic workplan aligned with the text, and is it showing realistic timelines.

Relevance to Beneficiaries
- Are the main beneficiaries of the proposed work being identified?
- Are the mechanisms and pathways to create impact appropriate?

The Department and College take plagiarism very seriously. Do not plagiarise. You must read and comply with the college Policy on Plagiarism:

Any evidence of plagiarism will have serious consequences according to College rules.
**MRes Proposal Assessment Form**

**Imperial College London – Department of Chemistry**

**MRes in Nanomaterials 2016/17**

<table>
<thead>
<tr>
<th>Written style and Presentation</th>
<th>Supervisors</th>
<th>Independent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation</td>
<td>/30</td>
<td></td>
</tr>
<tr>
<td>Conciseness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clarity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Background information</th>
<th>Supervisors</th>
<th>Independent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command/completeness of literature</td>
<td>/30</td>
<td></td>
</tr>
<tr>
<td>Critical evaluation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Programme and methodology</th>
<th>Supervisors</th>
<th>Independent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice of methods</td>
<td>/25</td>
<td></td>
</tr>
<tr>
<td>Justified objectives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realistic time lines</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relevance to Beneficiaries</th>
<th>Supervisors</th>
<th>Independent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate mechanism</td>
<td>/15</td>
<td></td>
</tr>
<tr>
<td>Realistic impacts</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total                          | /100        |             |

Comments on research proposal (justify your mark taking into account the attached marking criteria): *(This will be seen by the course directors and external examiners)*

Feedback to student (Please provide feedback that will be passed on to the student):
Account is taken of the nature of the work proposed, critical analysis of the relevant literature, the proposed work and what is reasonably achievable in the timescale of the course.

<table>
<thead>
<tr>
<th>Percentage Grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>85-100</td>
<td><strong>Exceptional.</strong> Outstanding analysis of the relevant literature and methodology showing a standard equal to successful research council grants in depth and content. Evidence of originality, high critical/analytical ability.** Competent assessment of the limitations of the proposed research and the relevance and impact of the proposed research (putting the work in context).</td>
</tr>
<tr>
<td>70-84</td>
<td><strong>Excellent.</strong> As for Exceptional, but not fully achieving one of them.</td>
</tr>
<tr>
<td>60-69</td>
<td><strong>Very Good.</strong> Complete and accurate presentation of the literature, experimental procedures and proposed work, showing a clear understanding of the methodology. Demonstrates critical/analytical ability** including an assessment of the limitations of the proposed work and the relevance of the research.</td>
</tr>
<tr>
<td>55-59</td>
<td><strong>Good.</strong> Accurate account and presentation of most of the background, experimental procedures and proposed work. Demonstrates critical/analytical ability** including an assessment of the limitations of the proposed work and the relevance of the research, but has significant errors of interpretation.</td>
</tr>
<tr>
<td>50-54</td>
<td><strong>Adequate.</strong> Basic account and presentation of the background, experimental procedures and proposed research. Demonstrates some critical/analytical ability** including an assessment of the significance of the research, but has major errors or omissions.</td>
</tr>
<tr>
<td>35-49</td>
<td><strong>Unsatisfactory.</strong> Confused and incomplete account of the background, experimental procedures and proposed work. Presence of errors of interpretation or factual mistakes.</td>
</tr>
<tr>
<td>20-34</td>
<td>Vague and seriously inadequate account and presentation of the proposed work with substantial omissions and errors. Very poor review of relevant literature.</td>
</tr>
<tr>
<td>10-19</td>
<td>Mainly incorrect and incompetent background information and research proposal demonstrating only few relevant thoughts.</td>
</tr>
<tr>
<td>1-9</td>
<td>Incorrect and incompetent literature survey and research proposal containing nothing of relevance.</td>
</tr>
<tr>
<td>0</td>
<td>Work not handed in. Mark given where the work presented is discovered not to be that of the candidate (plagiarised). Further disciplinary action is usually taken in cases of plagiarism.</td>
</tr>
</tbody>
</table>

**Analytical** = assessing a hypothesis or statement by breaking it down into its elements and examining their inter-relationships and contribution to the whole; cf. **Critical** = judging a hypothesis or conclusion by examining the validity of the evidence adduced for it.
Please read all the following guidelines carefully.
The following should be submitted on or before 14:00 Thursday 25th August 2017.

- One signed Plagiarism Form
- An electronic copy of your manuscript (PDF) sent via email to the MRes programme coordinator Dr. Mike Ray.
- An electronic copy of your manuscript (in Word format) uploaded onto Blackboard virtual learning environment.

Report format
The report should present your MRes project research achievements (both positive and negative). The report should not be any longer than 60 pages in length.

Note that you are expected to consult your supervisors for advice on preparing your research manuscript; your supervisors and their groups have long experience of preparing reports and papers for publication, so take advantage of their expertise early in the process. You have read many papers during your MRes to date, so you should be very familiar with how data and information are presented.

The Report should include the following sections (further divided into subheadings wherever needed to enhance readability):

**Title**
The manuscript should have a concise title directed at the general reader. Please note that abbreviations in the title should be avoided.

**Author names**
As author of this manuscript, you should be the first author listed. Full names should be given. Please also list your supervisors as the co-authors.

**Abstract**
The paper must include an abstract which is a summary (50-350 words) setting out briefly and clearly the main objects and results of the work; it should give the reader a clear idea of what has been achieved. The summary should be essentially independent of the main text; however, names, partial names or linear formulae of compounds may be accompanied by the numbers referring to the corresponding displayed formulae in the body of the text. Please do not cite references in the abstract.

**Keywords**
You should list three to ten keywords representing the main content of the article.

**Introduction**
*This should give clearly and briefly, with relevant references, both the nature of the problem under investigation and its background.*

**Methodology**
Descriptions of experiments should be given in detail sufficient to enable experienced experimental workers to repeat them. Descriptions of established procedures are unnecessary. Standard techniques and methods used throughout the work should be stated at the beginning of the section. Apparatus should be described only if it is non-standard; commercially available instruments are referred to by their stock numbers (*e.g.* Perkin-Elmer 457 or Varian HA-100 spectrometers). The accuracy of primary measurements should be stated.


Results and Discussion
It is usual for the results to be presented first, followed by a discussion of their significance. You are marked both on the clarity and conciseness of your report. Therefore only relevant results should be presented and figures, tables, and equations should be used for purposes of clarity. This can include the use of flow diagrams and reaction schemes. Supporting information and data should be included in the supplementary section of your submission.

Conclusions & Future Work
This section should state the main conclusions of your research project, and give a clear explanation of their importance and relevance. It should be used to highlight the novelty and significance of the work and how it sits relative to the state of the art in the field.

Acknowledgements
Contributors other than co-authors (i.e. supervisors) may be acknowledged in a separate paragraph at the end of the paper; acknowledgements should be as brief as possible. All sources of funding should be declared.

Bibliographic references and notes
These should be listed at the end of the report in numerical order. Details regarding the format of the bibliography are given below. Note that the names of journals or their abbreviations should be written in italics.

Style and presentation
Brevity
Your report should be written clearly and concisely. Repetition or embellishment with unnecessary words or phrases should be avoided. Excessive use of diagrams and duplication of data in text, tables and figures is discouraged.

Grammar and spelling
Standard English or American spelling may be used but consistency should be maintained throughout the document.

Abbreviations
The use of common or standard abbreviations is encouraged. If non-standard abbreviations must be used these should be defined at the first use.

Illustration and figures
Preparation of graphics
Graphics to be embedded in the report should fit within either single column (8.3 cm) or double column (17.1 cm) width, and must be no longer than one page.

- Schemes and structures should be drawn to make best use of single and double column widths. Lettering used in graphics should be legible at the required size (e.g. 7 point Arial font or Helvetica if Arial is unavailable)
- The format of units in graphics should conform to IUPAC convention and be consistent with those used in the paper
- Insets in images should be avoided where possible. However, if insets are used there is no need to shrink down the size of the text, axes labels and symbols in the inset. These should be the same size as in the main graph so that they are readable.

Chemical Structures
Structural formulae should ideally be prepared with chemistry drawing software (e.g. ChemDraw, ChemWindows, ISIS/Draw).

Figure Legends
Figure legends should be included underneath each figure. Each legend should include a figure number (in sequence using Arabic numerals i.e. Figure 1, 2, 3 etc); short title of the figure (maximum 15 words); detailed legend, up to 300 words.
Tables and Table legends
Each table should be numbered and cited in sequence using Arabic numerals (i.e. Table 1, 2, 3 etc). Tables should have a title (above the table) that summarises the whole table; it should be no longer than 15 words). Detailed legends may then follow, but should be concise.

Bibliographic references
You are assessed on your command of the literature. Therefore you should ensure that you adequately cite the relevant literature throughout your report. Around 50 references might be expected for a report of this length, with further references included in the supplemental data. You are required to make use of reference managing software (e.g. EndNote) to standardise your bibliography. All references must be numbered consecutively, in brackets, in the order in which they are cited in the text (including those in tables and figure captions, which should be numbered according to where the table or figure is designated to appear).

The references themselves should be listed at the end of the text, as indicated in the template. The names and initials of all authors are always given in the reference; they must not be replaced by the phrase et al. Examples of the report reference style are given below, and must be adhered to.

Journals
The style of journal abbreviations to be used here is as defined in Chemical Abstracts Service Source Index (CASSI). See http://www.cas.org/expertise/cascontent/caplus/corejournals.html If you cannot locate an authoritative abbreviation for a journal, and if it is not obvious how the title should be abbreviated, please cite the full title.

Bibliographic details should be cited in the order: year, volume, page. Where page numbers are not yet known, articles should be cited by DOI (Digital Object Identifier), e.g. A. R. Jones, *Dalton Trans.*, 2005, DOI: 10.1039/B503459J.

Article within a journal

Books

Patents

Reports and bulletins, etc.

Material presented at meetings

Theses

Reference to unpublished material
For material presented at a meeting, congress or before a society, etc. but not published, the following form is used: A. R. Jones, presented in part at the 28th Congress of the International Union of Pure and Applied Chemistry, Vancouver, August 2001.

For material accepted for publication, but not yet published, the following form is used: A. R. Jones, *Angew. Chem.*, in press.

For material submitted for publication but not yet accepted the following form is used: A. R. Jones, *Angew. Chem.*, submitted.

For personal communications the following is used: G. B. Ball, personal communication.
Footnotes
Footnotes may be used to present material which, if included in the body of the text, would disrupt the flow of the argument but which is, nevertheless, of importance in qualifying or amplifying the textual material. Footnotes are referred to with the following symbols: †, ‡, §, ¶, ‖ etc.
Please note that any material exceeding the conciseness of a footnote, but which is relevant to the report conclusions should be placed in the supplementary material.
Imperial College London – The Department of Chemistry

MRes in Nanomaterials 2016/17

MRES Final Project Report ASSESSMENT 2016-17

Student’s Name: 

Title of Report:

Report due from student: 25th August 2017

Received:

Supervisors’ Names:

Marker:

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Performance</th>
<th>Supervisors’ Mark† Performance</th>
<th>Criterion</th>
<th>Supervisor Report Mark†</th>
<th>Independent Report Mark†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill</td>
<td>/30</td>
<td>Background</td>
<td></td>
<td>/20</td>
<td>/20</td>
</tr>
<tr>
<td>Originality</td>
<td>/10</td>
<td>Understanding</td>
<td></td>
<td>/30</td>
<td>/30</td>
</tr>
<tr>
<td>Achievement</td>
<td>/30</td>
<td>Experimental</td>
<td></td>
<td>/30</td>
<td>/30</td>
</tr>
<tr>
<td>Commitment</td>
<td>/10</td>
<td>Presentation</td>
<td></td>
<td>/20</td>
<td>/20</td>
</tr>
<tr>
<td>Record keeping</td>
<td>/20</td>
<td>---</td>
<td></td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

Total Mark /100 | /100 | /100 |

Signed: 

Date: 

MRES Directors Review:

Agreed Supervisor Mark: 

Agreed Report Mark: 

Final Mark (90% Report + 10% Performance):

Comment:

Notes:
- † Circle as appropriate.
- Where the independent assessor and supervisor disagree about the merit of the report, the Course Directors will commission a third assessor and/or arbitrate.
- Return this form with the report to: Dr. Mike Ray, room 258, Chemistry, **by Thursday 8th September 2017**
- Supervisors, please also state as part of your report, how much support you gave the student
- **Overall comments should be written overleaf and will be passed to students as feedback.**
  Any brief confidential comments to the examiners should be written here (or on a separate sheet):
Imperial College London – The Department of Chemistry

MRes in Nanomaterials

Criteria for Assessment of Research Project Report

Account is taken of the nature of the work, endeavour in the laboratory, the instructions provided and what is reasonably achievable.

<table>
<thead>
<tr>
<th>Percentage Grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>85-100</td>
<td><strong>Exceptional.</strong> Outstanding presentation of results showing publishing standard in quality and quantity. Evidence of originality, high critical/analytical ability** and substantial outside reading. Competent assessment of the limitations of the experimental procedures and the significance of results.</td>
</tr>
<tr>
<td>70-84</td>
<td><strong>Excellent.</strong> As for Exceptional, but not fully achieving one of them.</td>
</tr>
<tr>
<td>60-69</td>
<td><strong>Very Good.</strong> Accurate account and presentation of results and experimental procedures showing a clear understanding of the background by providing evidence of sufficient outside reading. Demonstrates critical/analytical ability** including an assessment of the limitations of the experimental procedures and the significance of results.</td>
</tr>
<tr>
<td>55-59</td>
<td><strong>Good.</strong> Accurate account and presentation of most of the background, experimental procedures and results. Demonstrates critical/analytical ability** including an assessment of the limitations of the experimental procedures and the significance of results, but has significant errors of interpretation.</td>
</tr>
<tr>
<td>50-54</td>
<td><strong>Adequate.</strong> Basic account and presentation of the background, experimental procedures and results. Demonstrates some critical/analytical ability** including an assessment of the significance of results, but has major errors or omissions.</td>
</tr>
<tr>
<td>35-49</td>
<td><strong>Unsatisfactory.</strong> Confused and incomplete account of the background, experimental procedures and results marred by substantial errors or omissions.</td>
</tr>
<tr>
<td>20-34</td>
<td>Vague and seriously inadequate account of the experiments with substantial omissions and errors.</td>
</tr>
<tr>
<td>10-19</td>
<td>Mainly incorrect and incompetent account and presentation of experimental work demonstrating only few relevant thoughts.</td>
</tr>
<tr>
<td>1-9</td>
<td>Incorrect and incompetent account of experimental work containing nothing of relevance</td>
</tr>
<tr>
<td>0</td>
<td>Experiment not attempted or work not handed in. Mark given where the work presented is discovered not to be that of the candidate (plagiarised). Further disciplinary action is usually taken in cases of plagiarism.</td>
</tr>
</tbody>
</table>

** Analytical = assessing a hypothesis or statement by breaking it down into its elements and examining their inter-relationships and contribution to the whole; cf. Critical = judging a hypothesis or conclusion by examining the validity of the evidence adduced for it.
MRes Symposium Presentation ASSESSMENT: September 2017

Student’s Name:

Title of Talk:

SUPERVISORS / Markers Name

MARKS:

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Course Director Mark</th>
<th>Course Co-ordinator Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro, General Background &amp; Context</td>
<td>/25</td>
<td>/25</td>
</tr>
<tr>
<td>Results &amp; Scientific Content</td>
<td>/50</td>
<td>/50</td>
</tr>
<tr>
<td>Future Work &amp; Foresight</td>
<td>/25</td>
<td>/25</td>
</tr>
</tbody>
</table>

Total Mark /100 /100

Signed: __________ Date: __________

MRES Directors Review

Agreed Mark: __________ Final Mark: __________ %

Comment: __________________________ Signed: __________________________

Comments on presentation
### Criteria for Assessment of MRes project oral presentation performance

<table>
<thead>
<tr>
<th>Percentage Grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>85-100</td>
<td><strong>Exceptional.</strong> Presentation is comprehensive and well structured, displays an excellent understanding of the relevant concepts and facts and contains exceptional detail.</td>
</tr>
<tr>
<td>70-84</td>
<td><strong>Excellent.</strong> Presentation gives an accurate account of all the main points, displays a clear understanding of the material and includes a high level of detail.</td>
</tr>
<tr>
<td>60-69</td>
<td><strong>Very Good.</strong> Presentation gives an accurate account of all the main points and displays a clear understanding of the material, but is slightly flawed in organisation or detail.</td>
</tr>
<tr>
<td>55-59</td>
<td><strong>Good.</strong> Presentation shows a clear grasp of relevant concepts and facts and gives a mainly accurate account of the main points and their significance, but lacks detail.</td>
</tr>
<tr>
<td>50-54</td>
<td><strong>Adequate.</strong> Presentation shows a grasp of the basic concepts and facts and (ii) includes the major points, but (iii) does not go beyond that, or goes beyond that but is then marred by significant errors or flawed organisation</td>
</tr>
<tr>
<td>35-49</td>
<td><strong>Fail.</strong> Presentation shows a relatively weak grasp of the subject and (ii) is marred by major errors or brevity, but (iii) by presenting at least a third of the material expected,</td>
</tr>
<tr>
<td>20-34</td>
<td><strong>Fail</strong> shows a confused understanding of the question, and (ii) presents less than a third of a material expected.</td>
</tr>
<tr>
<td>10-19</td>
<td><strong>Fail.</strong> Presentation is too inaccurate, too irrelevant, or too brief to indicate more than a vague understanding of the question and (ii) presents, at most, only about a quarter of the material expected</td>
</tr>
<tr>
<td>1-9</td>
<td><strong>Fail.</strong> Presentation contains only two or three concepts or facts that are correct and relevant.</td>
</tr>
<tr>
<td>0</td>
<td><strong>Fail.</strong> Presentation contains nothing correct that is relevant. Mark given where the work presented is discovered not to be that of the candidate (plagiarised). Further disciplinary action is usually taken in cases of plagiarism.</td>
</tr>
</tbody>
</table>
Instructions on submitting your Literature Report & Project Plan or Research project report on Blackboard Learn

1. Go to Blackboard Virtual Learning Environment homepage https://bb.imperial.ac.uk and log in using your College username/password

2. Select your MRes course, i.e Chemical Biology of Heath & Disease from the Course List shown.
3. Select **Course Content** and left click the **view/complete** link (circled) for the report you need to submit, in this example **MRes final manuscript 2016**. This will take you to ‘Turnitin UK’.

4. Ensure ‘**single file upload**’ is selected under “Choose a paper submission method”.

Enter your ‘**first and last name**’

Enter the ‘**submission title**’ – this is your Literature Report or Manuscript Title

Select ‘**Browse**’ and locate your Manuscript and select it

Press ‘**Upload**’
5. Press **submit** once your report has been uploaded onto the system.

6. You will receive a notification if the document has been successfully submitted.

7. You can now log out of Blackboard.
Please read this carefully. You will be required to submit a signed copy of this form to cover all the work submitted for the MRes in Nanomaterials course.

The Department of Chemistry, Imperial College – Plagiarism Policy

The Department of Chemistry and College take plagiarism very seriously. All work submitted as part of the requirements for any examination (including coursework) of Imperial College London must be expressed in your own words and incorporate your own ideas and judgments.

Plagiarism is the presentation of another person’s thoughts, words or graphics/art work as though they were your own. This includes e.g. copying text, figures, schemes and graphs from another source such as a book, an academic article/paper or the internet without acknowledging it explicitly. Plagiarism 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/cite your sources.

Direct quotations (i.e. anything that is “copy-pasted”) 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. This means you must provide the reference directly after information is given and, in the case of figures/schemes/graphs indicate explicitly in the caption that this has been taken from the literature: e.g. “Figure taken from ref. X” or “Scheme adapted from ref. Y”. 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 judgments, figures, diagrams or software, you must refer to that person in your text (and in the case of figures/schemes/graphs in the caption of the corresponding graphic), and include the work referred to in your bibliography/reference list. If in doubt, ask for advice from academic staff in the Department 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 (see also ‘addendum 1’: ‘Plagiarism in the context of MRes Research Reports’, below). Where group work is submitted, this should be presented in an approved manner. You should therefore consult the supervisor of the group assignment, your tutor or another member of academic staff 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.

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 directors and the Director of MRes Studies who will take appropriate action which may result in an allegation of plagiarism/cheating. Cases of suspected plagiarism/cheating will be dealt with by the College Registry under the College’s Examination Offences Policy. The penalty for proven cases can vary from loss of marks to expulsion from the College.

NB. This policy is adapted from the Imperial College Student Handbook: http://www3.imperial.ac.uk/studenthandbook/advice/plagiarism/ (accessed 15.07.2010).

ADDENDUM 1: Plagiarism in the Context of MRes Research project report:
We recognise that your Introduction and Aims and Objectives sections may have substantial overlap in terms of content with your Literature Report & Project Plan. Consequently, for these sections, a reasonably lenient threshold for self-plagiarism (which will be picked up by the electronic plagiarism scans that we perform on both documents, see later) will be allowed (e.g. some identical sentences and paragraph constructions). However, wholesale verbatim transcription of multiple paragraphs should be avoided. If you think this is necessary then place the relevant text in inverted commas and insert a reference to your Literature Report & Project Plan. In general, it is expected that your understanding of the project will have matured substantially during the course of the year and that such verbatim transcription will not be appropriate.

**ADDENDUM 2: How to Correctly Reference Material**

In a research publication or reference work you will almost always find a bibliography/reference section included. The aim of this is three fold, to act as a source of background information for the interested reader, to provide original sources for specific pieces of information vital to your scientific case, and to acknowledge the efforts of others on whom you have drawn for ideas and inspiration. The most usual way of referencing a paper, book, figure or quotation in the text is to use a superscript number,1 or number in parenthesis [1], or an author name in parenthesis (Spivey, 2001), clearly associated with the item you want to reference. The first mentioned convention (i.e. using superscripted numbers) is employed in most chemistry journals and is illustrated below, but this is varies with academic discipline. If you select ‘RSC style’ within the reference manager Endnote then the superscripted number style of referencing will be implemented automatically. In the bibliography/reference section you must then give the full source. The source should be completely specified such that it can be located without ambiguity by the reader. Therefore, the bibliography should generally contain static references such as journal papers and books; citing dynamic reference sources such as websites is discouraged as they may disappear.

If you need to cite material from a website and you cannot trace the primary source, then you should quote text directly from the website, using quotation marks around the text in question. The text must then be referenced, in the manner indicated above, to the full website URL with the date on which you viewed it indicated in parenthesis. Similarly, if you copy figures from the web, you must clearly state so in the figure caption and this should also be referenced, in the manner indicated above, to the full website URL with the date on which you viewed it indicated in parenthesis.

Always ensure that you make it clear where your work stops, and copied material starts, and that you give a sufficiently detailed reference to allow the source to be identified clearly and uniquely.

Useful additional College sources of information re-Plagiarism see:

Department of Physics:
http://www3.imperial.ac.uk/physics/students/ug/info/guidance/

**I have read and understood the above and am willing for the Course Directors to submit any piece of my work to the TurnitinUK Plagiarism Detection Service.**

Signed……………………………………………………..Date………………………..

Print Name………………………………………………………………………. 