1. **Title of the module**

CHEM7400 (CH740) - MChem Research Project

1. **School or partner institution which will be responsible for management of the module**

Physical Sciences

1. **The level of the module (Level 4, Level 5, Level 6 or Level 7)**

Level 7

1. **The number of credits and the ECTS value which the module represents**

75 credits (37.5 ECTS)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Autumn and Spring

1. **Prerequisite and co-requisite modules**

Successful completion of Stage 3 of the Chemistry Programme to threshold required for progression into Stage 4.

1. **The programmes of study to which the module contributes**

MChem Chemistry

1. **The intended subject specific learning outcomes.
On successfully completing the module students will be able to:**

Procedures:

8.1 Understand the procedures and skills required to undertake a research project in chemistry.

Information:

8.2 A critical awareness of current research at the forefront of chemistry and discipline boundaries, together with the capacity to evaluate its relevance to scholarship, industrial and commercial practice where appropriate.

8.3 The ability to acquire and assimilate information effectively in any appropriate medium, including the increasing range of networked information resources where relevant.

8.4 Critical understanding of the reliability of data from various sources (spanning peer reviewed articles in prominent journals, online databases (e.g. RSC ChemSpider), Wikipedia, newspaper articles, web based discussion forums).

8.5 Demonstrate conceptual thinking to evaluate critically current research and/or methodologies in chemistry, develop critiques of them and, where appropriate, adapt them in the context of both advanced scholarship and industrial/business/commercial/professional relevance.

Experimentation:

8.6 Working knowledge of a variety of experimental, computational and/or theoretical techniques applicable to current research within chemistry.

8.7 Experimental, computational and/or theoretical skills showing the competent use of specialised equipment or techniques, the ability to identify appropriate pieces of equipment and to master new techniques and equipment.

Planning:

8.8 Problem-solving skills, in the context of both problems with well-defined solutions and especially the challenges associated with open-ended problems.

8.9 The ability to plan an experiment or investigation under supervision, including consideration of the appropriate data analysis (errors, statistical significance, etc.) which will be required.

8.10 An ability to formulate problems in precise terms and to identify key issues, and the confidence to try different approaches in order to make progress on challenging problems.

Securing and analysing data:

8.11 The systematic, careful and reliable recording of experimental/computational data or derivation of theoretical results.

8.12 An ability to analyse critically the results of an experiment or investigation and draw valid conclusions. To evaluate the level of uncertainty in these results and compare them with expected outcomes, theoretical predictions or with published data; thereby to evaluate the (statistical) significance of their results in this context where appropriate.

Communication:

8.13 An ability to communicate complex scientific ideas, the premises and conclusion of an experiment, investigation or project concisely, accurately and informatively, both orally and in writing, to specialist and non-specialist audiences.

8.14 An ability to present and interpret information using traditional and/or contemporary methods of dissemination (such as graphics static/animation etc.)

1. **The intended generic learning outcomes.
On successfully completing the module students will be able to:**

9.1 An independent learning ability: to use initiative, to organise oneself to meet deadlines and to interact constructively with people including those from other disciplines.

9.2 Self-direction and originality in tackling and solving problems, working effectively both individually and in teams at a professional level, making informed judgements in the absence of complete data.

1. **A synopsis of the curriculum**

Students will undertake a project from an available project listing and will work under the guidance of a supervisor. The student will be encouraged to develop some level of research independence within the project remit appropriate of an M-level masters' student. The project will be assessed on a number of criteria, which will include the project work (the amount, quality, level of effort, etc. appropriate for the level), the preparation of a written report, an oral presentation, and a viva voce examination session. The composition of a micro review on a topic of the student's choice will round-off their skills through critical analysis of the academic literature.

Aims:

* To conduct individual masters level research.
* To develop research independence such that the student can take responsibility for the research direction of the project within the confines of the project remit.
* To further deepen the student's knowledge within a specific research area.
* To prepare students for independent research careers in industry or at PhD level.
* To further enhance student’s abilities for scientific communication through oral presentations and report writing.
* Time management and forward planning skills.
1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**
* Appropriate learned journals and texts as set by project supervisor and sourced by student
* Whitesides Group: Writing a Paper Adv. Mater. 2004, 16, 1375-1377
* How to Write and Publish a Scientific Paper, R. A. Day, Greenwood Press, 1998, ISBN: 1573561657
* Demystifying Masters Dissertations, A Guide to Producing a Successful Dissertation, D.M. Moore and D.S. Wright, Cranfield University, 2002, ISBN: 861940882
* A Handbook of Writing for Engineers J. Van Emden, Macmillan, 1998, ISBN: 0333728076
* Writing Successfully in Science, M. O’Connor, Spon, 2002, ISBN: 0419252401
1. **Learning and teaching methods**

Total contact hours: 196

Private study hours: 554

Total study hours: 750

1. **Assessment methods**
	1. Main assessment methods

Assignment (microreview) (5 pages, 15%)

Assignment (project report) (50 pages, 40%)

Supervisor assessment (15%)

Presentation (20 mins, 15%)

Viva (20 mins, 15%)

13.2 Reassessment methods

Like-for-like

1. **Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section12) and methods of assessment (section 13)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | *8.1* | *8.2* | *8.3* | *8.4* | *8.5* | *8.6* | *8.7* | *8.8* | *8.9* | *8.10* | *8.11* | *8.12* | *8.13* | *8.14* | *9.1* | *9.2* |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Private Study** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| *Laboratory* | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| *Workshops* | **X** | **X** | **X** | **X** | **X** |  |  |  | **X** | **X** |  | **X** | **X** | **X** |  |  |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *Assignment (microreview)* | **X** | **X** | **X** | **X** | **X** |  |  |  |  |  |  |  | **X** | **X** | **X** |  |
| *Assignment (project report)* | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| *Supervisor assessment* | **X** | **X** |  | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |  |  | **X** |
| *Presentation* | **X** | **X** | **X** |  |  | **X** | **X** |  |  |  | **X** |  | **X** | **X** | **X** |  |
| *Viva*  | **X** | **X** |  | **X** |  | **X** | **X** | **X** | **X** | **X** |  |  | **X** |  |  |  |

1. **Inclusive module design**

The School recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Canterbury

1. **Internationalisation**

Chemical findings contained within this module have been discovered by residents of many diverse countries and recognised as internationally important by awards such as the Nobel Prize. All the students will be well versed in internationally recognised ‘language’ of structure and mechanism in organic chemistry.

**FACULTIES SUPPORT OFFICE USE ONLY**

**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
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Revised FSO Jan 2018