MODULE SPECIFICATION TEMPLATE

**SECTION 1: MODULE SPECIFICATIONS**

1. Title of the module

CH622 – Topics in Inorganic Synthetic Chemistry

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

School of Physical Sciences

1. Start date of the module

September 2015

1. The number of students expected to take the module

25

1. Modules to be withdrawn on the introduction of this proposed module and consultation with other relevant Schools and Faculties regarding the withdrawal

N/A

1. The level of the module (e.g. Certificate [C], Intermediate [I], Honours [H] or Postgraduate [M])

H

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

15 (ECTS 7.5)

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

Autumn

1. Prerequisite and co-requisite modules

Completion of Stage 2 of the following programmes: Chemistry (BSc); Chemistry (MChem) and Chemistry with year in Industry

1. The programmes of study to which the module contributes

Chemistry (BSc); Chemistry (MChem) and Chemistry with year in Industry

1. The intended subject specific learning outcomes

Knowledge and understanding of:

11.A1 Core and foundation scientific concepts, terminology, theory, units, conventions, and laboratory practice and methods in relation to inorganic synthetic chemistry.

11.A3 Areas of inorganic synthetic chemistry including synthetic pathways of inorganic materials, such as sol-gel, “shake and bake” and high pressure synthesis.

11.A4 Appreciate developments at the forefront of some areas of inorganic materials chemistry such as nanoparticles and catalysts.

Intellectual skills:

11.B1 Ability to demonstrate knowledge and understanding of inorganic synthetic chemistry methods and to apply such knowledge and understanding to the solution of qualitative and quantitative problems in inorganic synthetic chemistry.

11.B2 Ability to recognise and analyse problems in inorganic synthetic chemistry and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data.

Subject-specific skills:

11.C1 Skills in the safe handling of chemical materials, taking into account their physical and chemical properties, including any specific hazards associated with their use and to risk assess such hazards.

11.C2 Skills required for carrying out documented standard laboratory procedures involved in synthetic work in relation to inorganic systems. Skills in observational and instrumental monitoring of physiochemical events and changes. The systematic and reliable documentation of the above. Operation of standard analytical instruments employed in the chemical sciences.

11.C3 The ability to collate, interpret and explain the significance and underlying theory of experimental data, including an assessment of limits of accuracy.

1. The intended generic learning outcomes

Transferable skills:

12.D1 Communication skills, covering both written and oral communication.

12.D2 Generic skills needed for students to undertake further training of a professional nature.

12.D3 Problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information.

12.D4 Numeracy and computational skills, including such aspects as error analysis, order-of-magnitude estimations, correct use of units and modes of data presentation.

12.D7 Interpersonal skills, relating to the ability to interact with other people and to engage in team working within a professional environment.

12.D8 Time-management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working. Self-management and organisational skills with the capacity to support life-long learning.

1. A synopsis of the curriculum

Lectures (24 lectures):

1. Sol-gel, hydrothermal and templated synthesis.
2. Synthesis of nanoparticles. Control of their size and shape. Functionalisation and stabilisation.
3. Catalyst design and synthesis.
4. “Shake and bake” to synthesise oxide materials for applications such as multiferroics.
5. High-pressure synthesis to prepare novel type of materials; advantages and disadvantages.
6. Indicative Reading List

# Synthesis of Inorganic Materials, Ulrich Schubert, Nicola Husing, ISBN: 978-3-527-32714-0, Wiley

1. Learning and Teaching Methods, including the nature and number of contact hours and the total study hours which will be expected of students, and how these relate to achievement of the intended module learning outcomes

* lectures given by a variety of teachers (24hrs); practical lab classes (18 hrs);
* assignments (50hrs); personal study using textbooks, and other self-study material (58 hrs).
* Total number of study hours: 150 hrs
* Lectures (11.A1, 11.A3, 11.A4, 11.B1, 11.B2)
* Practical lab classes (11.C1, 11.C2, 11.C3, 12.D3, 12.D7, 12.D8)
* Assignments (12.B1, 12.B2)
* Self-studies (12.D1, 12.D2, 12.D4, 12.D7, 12.D8)

1. Assessment methods and how these relate to testing achievement of the intended module learning outcomes

* 40% coursework: 3 assignment (25%), lab reports (15%);

Assignments (11.B1, 11.B2, 12.D2, 12.D3), lab reports (11.C1, 11.C2,11.C3, 12.D1, 12.D4, 12.D7, 12.D8).

* 60% final exam (written unseen)

Exam (11.A1, 11.A3, 11.A4, 12.D3)

1. Implications for learning resources, including staff, library, IT and space

* Lecture room, existing facilities;
* Chemical laboratory, existing facilities;
* Library resources (literature and space) for self-study, existing facilities;
* Moodle for lecture notes and on-line assignments, existing facilities.

1. The School) recognises and has embedded the expectations of current disability equality legislation, and supports students with a declared disability or special educational need in its teaching. Within this module we will make reasonable adjustments wherever necessary, including additional or substitute materials, teaching modes or assessment methods for students who have declared and discussed their learning support needs. Arrangements for students with declared disabilities will be made on an individual basis, in consultation with the University’s disability/dyslexia support service, and specialist support will be provided where needed.
2. Campus(es) where module will be delivered:

Canterbury campus

***If the module is part of a programme in a Partner College or Validated Institution, please complete the following:***

1. Partner College/Validated Institution: N/A
2. University School responsible for the programme: N/A

**SECTION 2: MODULE IS PART OF A PROGRAMME OF STUDY IN A UNIVERSITY SCHOOL**

**Statement by the School Director of Learning and Teaching/School Director of Graduate Studies (as appropriate):** "I confirm I have been consulted on the above module proposal and have given advice on the correct procedures and required content of module proposals"

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| ................................................................  Director of Learning and Teaching/Director of Graduate Studies (delete as applicable)  …………………………………………………  Print Name | ..............................................  Date |

**Statement by the Head of School:** "I confirm that the School has approved the introduction of the module and, where the module is proposed by School staff, will be responsible for its resourcing"

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| .................................................................  Head of School  …………………………………………………….  Print Name | ..............................................  Date |

**SECTION 3: MODULE IS PART OF A PROGRAMME IN A PARTNER COLLEGE OR VALIDATED INSTITUTION**

(Where the module is proposed by a Partner College/Validated Institution)

**Statement by the Nominated Officer of the College/Validated Institution** *(delete as applicable)***:** "I confirm that the College/Validated Institution*(delete as applicable)* has approved the introduction of the module and will be responsible for its resourcing"

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| .................................................................  Nominated Responsible Officer of Partner College/Validated Institution  ………………………………………………….  Print Name  …………………………………………………..  Post | ..............................................  Date |

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Partner College/Validated Institution

Module Specification Template  
Last updated February 2013