CH418-15 Advanced Synthetic Chemistry

26/27

Department
Chemistry
Level
Undergraduate Level 4
Module leader
Sebastian Pike
Credit value
15
Module duration
10 weeks
Assessment
100% exam
Study location
University of Warwick main campus, Coventry

Description

Introductory description

This module encompasses advanced synthesis of molecules across the fields of inorganic, organic and supramolecular chemistry, from small to large structures relevant in catalysis, molecular machines, medicines and as precursors to (nano)materials. The module aims to provide the required skills to participate in practical synthetic chemistry at research level.

Module web page

Module aims

1. To develop student awareness of current problems and directions at the forefront of synthetic molecular chemistry.
2. To engage with and critically evaluate selected research literature in this area
3. To demonstrate design strategies to synthesise a range of important molecules
4. To build understanding of practical aspects of synthetic chemistry and analysis of products.
5. To build problem solving skills and knowledge to address research-based problems
   Students will undertake a written examination that will test both their critical thinking around the subject as well as their ability to apply their knowledge to original problems.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

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Depending on the nature of contemporary research and the particular research interests of staff members, at least four of the following areas will be addressed: precursors for inorganic synthesis; polar-organometallic reagents; bioinorganic chemistry; total synthesis, including disconnection strategies and protecting groups; stereocontrol and asymmetric induction; synthesis of mechanically interlocked molecules; homogenous transition metal catalysis & small molecule activation; soluble metal-organic cages and extended metal-organic frameworks.
By definition this module will focus on recent research and the specific examples and literature discussed may differ on a year-to-year basis.
The module will be structured into four themed sets of lectures, with each accompanied by a corresponding suite of dedicated directed reading from the scientific literature and practical workshop time.

Learning outcomes

By the end of the module, students should be able to:

- Appreciate frontier topics in inorganic and organic molecular synthesis
- Design synthetic pathways to molecular structures
- Critically analyse contemporary literature in this research area
- Demonstrate enhanced knowledge of practical and analytical techniques relating to contemporary molecular synthesis

Indicative reading list

Reading lists can be found in Talis

Specific reading list for the module

Subject specific skills

Atomic and Molecular Structure
Functional Group Reactivity and Stereochemistry
Coordination Chemistry and Periodicity

Transferable skills

Critical thinking
Problem solving

Study

Study time

Type	Required
Lectures	12 sessions of 1 hour (8%)
Practical classes	12 sessions of 1 hour (8%)
Private study	126 hours (84%)
Total	150 hours

Private study description

N/A

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group B

Assessment component	Weighting	Study time	Eligible for self-certification
Written examination	100%		No

- Students may use a calculator
- Periodic Tables
- Answerbook Pink (12 page)

Reassessment component is the same

Feedback on assessment

Cohort level examination feedback provided via Moodle.

Past exam papers for CH418

Availability

Courses

This module is Optional for:

- UCHA-F110 Undergraduate Master of Chemistry (with Industrial Placement)
  - Year 4 of F110 MChem Chemistry (with Industrial Placement)
  - Year 4 of F112 MChem Chemistry with Medicinal Chemistry with Industrial Placement
- Year 5 of UCHA-F107 Undergraduate Master of Chemistry (with Intercalated Year)
- UCHA-F109 Undergraduate Master of Chemistry (with International Placement)
  - Year 4 of F109 MChem Chemistry (with International Placement)
  - Year 4 of F111 MChem Chemistry with Medicinal Chemistry (with International Placement)
- UCHA-4M Undergraduate Master of Chemistry Variants
  - Year 4 of F105 Chemistry
  - Year 4 of F125 MChem Chemistry with Medicinal Chemistry
- Year 5 of UCHA-F127 Undergraduate Master of Chemistry with Medicinal Chemistry(with Intercalated Year)