

CH3G0-15 Extended Laboratory

22/23

Department

Chemistry

Level

Undergraduate Level 3

Module leader

Daniel Murdock

Credit value

15

Module duration

3 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

N/A

[Module web page](#)

Module aims

This module builds on previous practical chemistry modules by offering a choice of two further optional practical experiments (each 5 CATS, with a choice of two experiments out of six offered) and the presentation of a piece of published research work through a poster.

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.

Each student will select two units from those listed below (the order does not necessarily reflect the running order). No more than one unit may be selected from any chemistry field (IOP). A process for soliciting preferred options will operate, and these will then be allocated to students subject to any timetabling and /or laboratory space restrictions;

Inorganic laboratory;

I2; Inorganic Laboratory - Polymer Synthesis (5 CATS); students plan and undertake the synthesis of small molecule organics to be used as ligands for transition metals, initiators and chain transfer agents and use these to synthesis a series of polyacrylate materials which are characterised by a range of physical techniques (NMR, GPC).

I3; Organometallic chemistry (5 CATS); This features a series of single stage syntheses and full characterisation of organometallic complexes based on arene ligands. Guidance will be given in the laboratory manual in the first instance, but second and subsequent preparations will draw heavily on the earlier attempts.'

Physical laboratory ;

P2; Physical laboratory 2 (5 CATS); In this computational experiment students will use molecular dynamics simulations to investigate the changes induced in the atomistic structure of a Lennard-Jones binary liquid by variations in the sample pressure and temperature. As part of this investigation, students will design their own simulation protocols, including precisely which thermodynamic conditions are to be explored and the timescales the simulations will cover.

Organic laboratory;

O2; Organic laboratory 2 (5 CATS); Students will complete a methodology study of an organic reaction, typically cross-coupling catalysis. A range of target molecules will be allocated to the group of students taking this module.

O3; Chemical Biology (5 CATS); Purification, analysis and catalytic activity investigations of a polyketide biosynthesis enzyme.

Outreach; circumstances permitting, students will be able to select an option to do a 5 CATs outreach-based project in place of one of the experiments. The number of places for this option is capped at 10 students and it is possible the department will be unable to offer this option due to the circumstances and logistical arrangements at the time. This would be assessed by a short reflective report.

COSHH assessments will be completed and checked for all the about units of this module before practical work is undertaken.

A full report on the work completed in each unit is submitted at the end of each unit. This is marked and the marker takes into account the quality of the write-up, the samples submitted, and the competence of the student during the unit.

The module also contains a specific lecture on presentation skills related to the poster presentation. Key skills elements of the module are outlined in the module aims above. Key skills elements of the module are outlined in the module aims above.

Learning outcomes

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

- Complete individual COSHH assessments for a diverse range of experiments
- Design synthetic and measurement experiments on the basis of input from laboratory scripts, literature sources, previous experiments and advice from demonstrators.

- Perform advanced synthetic techniques such as column chromatography, manipulation of air sensitive compounds and emulsion polymerisation.
- Understand and assess the spectroscopic etc. properties of new or unknown organic, organometallic or natural products in relation to their identity, purity and physico-chemical properties as appropriate.
- Present the results of their studies, including aspects of research work in a full laboratory report for each experimental unit.
- Present an area of research in the style of a poster/talk.

Indicative reading list

A bibliography is provided for each stage of the practical work in each unit. Standard texts and online resources are used for safety data.

Research element

e.g. individual or group research, research skills activity, etc.

Subject specific skills

Problem solving
 Organisation and time management
 Information literacy and research skills

Transferable skills

Problem solving
 Organisation and time management
 Information literacy and research skills

Study

Study time

Type	Required
Practical classes	10 sessions of 7 hours (47%)
Other activity	3 hours (2%)
Private study	77 hours (51%)
Total	150 hours

Private study description

Lab write-up and study 40 hours

Poster preparation and presentations 30 hours

or

Lab write-up and study 20 hours

Outreach session planning, delivery and reflective write-up 20 hours

Poster preparation and presentations 30 hours

Other activity description

Poster workshop

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

Assessment group A5

	Weighting	Study time
Poster Presentation	33%	
Practical Write Ups	67%	

Feedback on assessment

Formative and summative feedback on experimental write ups and poster/oral presentation marksheets. Verbal feedback during laboratory sessions and during the poster session.

Availability

Pre-requisites

To take this module, you must have passed:

- All of
 - [CH222-30 Practical and Professional Chemistry Skills II](#)

Courses

This module is Core for:

- Year 4 of UCHA-F107 Undergraduate Master of Chemistry (with Intercalated Year)
- UCHA-4M Undergraduate Master of Chemistry Variants
 - Year 3 of F105 Chemistry
 - Year 3 of F125 MChem Chemistry with Medicinal Chemistry
- Year 4 of UCHA-F127 Undergraduate Master of Chemistry with Medicinal Chemistry (with Intercalated Year)

This module is Option list A for:

- UCHA-4 Undergraduate Chemistry (with Intercalated Year) Variants
 - Year 4 of F101 Chemistry (with Intercalated Year)
 - Year 4 of F122 Chemistry with Medicinal Chemistry (with Intercalated Year)
- UCHA-3 Undergraduate Chemistry 3 Year Variants
 - Year 3 of F100 Chemistry
 - Year 3 of F100 Chemistry
 - Year 3 of F121 Chemistry with Medicinal Chemistry
- Year 3 of UCHA-F110 Undergraduate Master of Chemistry (with Industrial Placement)
- Year 3 of UCHA-4M Undergraduate Master of Chemistry Variants