CH169-15 Beyond Science: Collaborative Student-Led Challenges (CSLC)

24/25

Department
Chemistry
Level
Undergraduate Level 1
Module leader
Tom Ritchie
Credit value
15
Module duration
20 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

This optional module is designed for first-year Chemistry students who want to develop their skills as reflective, outward-facing, and impact-focused project leaders. The Beyond Science module will equip you with the principles, tools, and mindset needed to create, complete, and present a research project within a dedicated timeframe.

Throughout the three phases of the module (lasting 5 weeks each), you'll learn how to work in teams, define a research problem linked to the UN Sustainable Development Goals, engage the public and industry, and effectively communicate your findings through an academic poster presentation. Mentors from across different disciplines will support you throughout the process, and you'll have the freedom to choose a research topic that interests you.

Benefits Beyond the Module:

- Gain valuable experience for future assignments and research projects.
- Deepen your understanding of the Chemistry department and connect with academics

across campus.
- Learn about wider Warwick opportunities to apply your skills, including part-time work, volunteering (URSS), undergraduate research opportunities (ICUR/BCUR), and career development resources.

By the end of this module, you'll be well-equipped to tackle future academic challenges and contribute meaningfully to the scientific community.

Module aims

Students will gain invaluable insights into real-world project management, research, and public engagement skills from academics and leading industry professionals.

The module offers:

- Alternative Assessments: Students will experience diverse assessment methods beyond traditional reports, helping them develop their research and communication skills for future years in their degree, and beyond.

- Real-World Application: Students will apply their learning to authentic research projects, collaborating with experts to work on topics linked to the 17 UN Sustainable Development Goals.

- Early Exposure to Collaboration: The module fosters a collaborative environment, where students with diverse academic backgrounds can work together on interdisciplinary research projects, creating research posters, and navigating group working dynamics.

By engaging with industry experts and undertaking interdisciplinary research, students will complete the module with a well-rounded skillset that prepares them for success in future academic endeavours and professional careers. It will also help them identify a purpose or cause they can work on, which aligns with their interests.

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.

Beyond Science: Collaborative Student-Led Challenges (CSLC) provides students with a structured programme to choose a research problem they want to tackle as a group. Throughout the module, students will learn the principles, tools, and mindset needed to create, complete, and present a group research project. CSLC has been created to support the development of Chemistry students' skills as reflective, outward-facing, and impact-focused project leaders for the evolving workplace of the 21st century.

Students will be supported by an Early Career Fellow throughout the module, providing advice and guidance each week on their research challenge. However, the emphasis for planning and completing the project sits with the students and the extent to which they engage with the project milestones and the optional content released each week.

Learning outcomes

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

- SKU: Develop theoretical and practical knowledge of how to manage a research project, through mindset, techniques, and tools.
- SKU: Evaluate and apply theory and practice to make impacts and apply this knowledge to project challenges and external contexts.
- KS: Research skills and practical use of insight gathering methods such as networking, outreach, and interviewing techniques.
- KS: Teamwork and collaboration skills, working in teams and with interdisciplinary stakeholders to create effective, feedback-driven dynamics to constructively move forward.
- KS: Leadership and ability to lead project processes and teams of people in problem solving scenarios.
- CS: Creative thinking and ability to look at familiar problems, experiences and environments and re-imagine them in a new way.
- CS: Critical thinking and ability to deconstruct arguments and ideas, avoid bias, create informed arguments.
- CS: Storytelling and ability to inspire action with stories that are meaningful and powerful; ability to develop compelling arguments and presentations.
- SSS: Empathising and connecting with target audience to draw valuable and in-depth insights from user research to inform action.
- SSS: Effective, innovative, and interdisciplinary decision making and problem solving.
- SSS: Recombine and come up with ideas that are radical, innovative, creative, while being focused on the target audience and intended impact.

Indicative reading list

- A Young Innovator's Guide to STEM: 5 Steps To Problem Solving For Students, Educators, and Parents, Rao, Gitanjali
- The Innovator's Guide to Growth: Putting Disruptive Innovation to Work (Harvard Business School Press), Anthony, Scott D., Johnson, Mark W., Sinfield, Joseph V., Altman, Elizabeth J.
- Running Lean: Iterate from Plan A to a Plan That Works (Lean Series), Ash Maurya
- Innovation and Entrepreneurship (Routledge Classics), Drucker, Peter.
- Zero to One: Notes on Start Ups, or How to Build the Future, Masters, Blake, Thiel, Peter.
- Ten Types of Innovation: The Discipline of Building Breakthroughs, Keeley, Larry, Walters, Helen, Pikkel, Ryan, Quinn, Brian
- The Ten Faces of Innovation: Strategies for Heightening Creativity, Kelley, Tom
- Thinkertoys: A Handbook of Creative-Thinking Techniques, Michalko, Michael.
- Creative Confidence: Unleashing the Creative Potential within Us All, Kelley, David, Kelley, Tom.
- Range: How Generalists Triumph in a Specialized World, Epstein, David.
- Adapt: Why Success Always Starts with Failure, Tim Harford.

Books/Resources available in Warwick Library

- Lean project management -- How to apply Lean thinking to project management / Rainer Erne.
  https://encore.lib.warwick.ac.uk/iii/encore/record/C__Rb3754481__Sproject%20management__P0%
- Project management, Harvey Maylor, Neil Turner.
  https://encore.lib.warwick.ac.uk/iii/encore/record/C__Rb3766441__Sproject%20management__P0%
- Time Management, Kate Williams, Michelle Reid.
  https://encore.lib.warwick.ac.uk/iii/encore/record/C__Rb3442969__Stime%20management__P0%2

Research element

The projects that groups will be completing will teach them basic research skills.
The focus on UN Sustainable Development Goals will give them a understanding of how to apply research to real-world contexts.

Interdisciplinary

Mentors will be from non-Chemistry backgrounds. Research skills will come from business, innovation, and design thinking disciplines, and the project teams will be encouraged to engage with others outside of Chemistry.

Elements of transdisciplinary practice with colleagues from across different opportunities and services will speak to students each week, including: Careers, IATL, Wellbeing, URSS, WIE, Warwick Innovation, WIHEA.

International

Contributors to the module content will be from overseas organisations.

Subject specific skills

N/A - not a Chemistry subject-specific module.

Transferable skills

Academic Poster Design
Analysing, Synthesising, and Evaluating Information
Communication and Collaboration
Systems thinking
Engagement with industry and society
Verbal, Written, Reading, Listening
Interacting and empathising with others
Intercultural Curiosity
Collegiality
Team Working
Building Rapport
Peer Support

Intelligence Gathering
Preparation and Prioritisation
Project Planning and Delivery
Time Management
Proactivity
Design Thinking
Entrepreneurship
Creativity and Imagination
Lateral Thinking
Learning from Failure
Self-Reflection

Mapped on Warwick Skills Award Criteria
Critical Thinking
Information Literacy
Digital Literacy
Sustainability
Communication
Intercultural Awareness
Teamwork
Organisational Awareness
Professionalism
Problem Solving
Self-Awareness

Study

Study time

Type	Required
Lectures	15 sessions of 1 hour (10%)
Online learning (independent)	15 sessions of 1 hour (10%)
Other activity	30 hours (20%)
Private study	35 hours (23%)
Assessment	55 hours (37%)
Total	150 hours

Private study description

N/A

Other activity description

Groups expected to do 2 hours per week of non-timetabled group work on their project. This will

be monitored through weekly catch-ups and through assessments at end of each five-week block.

Costs

Category	Description	Funded by	Cost to student
Other	600 overall hours to be paid to mentors: • Hours – four hours per week per mentor (1 hour per group (x2), 1 hour as a wider group (split into two thirty-minute sessions, and 1 hour with Tom/Chris as part of preparation). 60 hours per mentor • FA5 (PhD): £643.05 (without on costs) • FA6 (ECF): £744.75 (without on costs) Overall projected costs (without on costs): • 300 x 14.29 (FA5) = £4,287 • 300 x 16.55 (FA6) = £4,965 • Total = £9,252 Costs for Launch Session and Conference Poster Presentations: • £1,500 for branding, prizes, refreshments, and expenses for two guest judges Cost to add VR component: • £2,000 - Have applied to IATL for this - will update.	Department	£0.00

Assessment

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

Assessment group A1

Assessment component	Weighting	Study time	Eligible for self-certification
Project Poster	60%	20 hours	No

	Weighting	Study time	Eligible for self-certification

At the end of phase three of the module, students will submit their research poster. This poster is split 50-50 between their research project, and reflecting on the process and skills developed.

Reassessment component is the same

Assessment component

Project Reflection Portfolio	10%	10 hours	No

At the end of phase two, students will submit a group reflection portfolio, detailing the skills and processes of working on their group project over the course of the module. This builds on their weekly formative reflections.

Reassessment component is the same

Assessment component

Module Engagement	10%	10 hours	No

This assessment will be judged against engagement with weekly content in online Teams groups, focused on formative reflections (the 1-2-1 rule).

Reassessment component is the same

Assessment component

Project Launch Piece	10%	5 hours	No

At the end of phase one of the project, teams will be required to create a project video/wiki on Teams of their project work and plan to launch it to the public.

Reassessment component is the same

Assessment component

Poster Presentation	10%	10 hours	No

In term three, project groups will demonstrate and present their research project at a research

	Weighting	Study time	Eligible for self-certification

symposium.

Reassessment component is the same

Feedback on assessment

Feedback will be given in written form on Moodle and Teams and verbally at weekly check ins.

Feedback on assessments will be provided within the 20-day turnaround.

Availability

Courses

This module is Optional for:

- UCHA-4 Undergraduate Chemistry (with Intercalated Year) Variants
  - Year 1 of F101 Chemistry (with Intercalated Year)
  - Year 1 of F122 Chemistry with Medicinal Chemistry (with Intercalated Year)
- UCHA-3 Undergraduate Chemistry 3 Year Variants
  - Year 1 of F100 Chemistry
  - Year 1 of F121 Chemistry with Medicinal Chemistry
- UCHA-F110 Undergraduate Master of Chemistry (with Industrial Placement)
  - Year 1 of F100 Chemistry
  - Year 1 of F110 MChem Chemistry (with Industrial Placement)
  - Year 1 of F112 MChem Chemistry with Medicinal Chemistry with Industrial Placement
- Year 1 of UCHA-F107 Undergraduate Master of Chemistry (with Intercalated Year)
- UCHA-F109 Undergraduate Master of Chemistry (with International Placement)
  - Year 1 of F109 MChem Chemistry (with International Placement)
  - Year 1 of F111 MChem Chemistry with Medicinal Chemistry (with International Placement)
- UCHA-4M Undergraduate Master of Chemistry Variants
  - Year 1 of F100 Chemistry
  - Year 1 of F105 Chemistry
  - Year 1 of F110 MChem Chemistry (with Industrial Placement)
  - Year 1 of F109 MChem Chemistry (with International Placement)
  - Year 1 of F125 MChem Chemistry with Medicinal Chemistry
- Year 1 of UCHA-F127 Undergraduate Master of Chemistry with Medicinal Chemistry(with Intercalated Year)