

CH974-10 Advanced Polymer Synthesis

26/27

Department

Chemistry

Level

Taught Postgraduate Level

Module leader

Sebastien Perrier

Credit value

10

Module duration

10 weeks

Assessment

20% coursework, 80% exam

Study location

University of Warwick main campus, Coventry

Description

Introductory description

This module is cotaught with the undergraduate MChem course CH404: Synthetic Chemistry III (Macromol) and consists of 10 lectures between October and December. Two lecturers will deliver the content and you will have an extended workshop with each lecturer (just Polymer MSc students) to discuss recent literature in the area. The assessed work component will be to write an essay detailing literature advances by an assigned author relating to the content of the lectures.

[Module web page](#)

Module aims

This module is designed to present and develop awareness of the most recent and advanced techniques in polymer synthesis including advanced techniques, catalysts and polymer modification. Students will have the opportunity to evaluate critically selected current research in this area. The course is designed to allow students to be original in the application of their knowledge to the solution of, research-based problems and will be achieved by a range of teaching methods including directed reading and set exercises. Students will be expected to undertake a significant amount of student centered learning around the subject which will be

directed appropriately during the 10 academic contact hours with the whole class.

An additional contact hour a week will be set aside (as bookable) so that students who have concerns with directed reading and student centred learning can discuss their problems with an academic on a one to one or group basis. Students will be expected to demonstrate their abilities by critical evaluation of recent published material in one of the areas of study. This will be achieved the presentation of a written report/poster. Students will also undertake a written examination, which 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.

By definition this module will focus on VERY RECENT research in the areas of study. The specific examples used may differ on a year to year basis.

Syllabus

A compulsory set of 10 classes will be used to discuss material in two of the following areas.

New controlled polymer synthetic methods (5 lectures + seminars)

Adaptation of living polymerisation for advanced applications

Responsive polymers (thermal, pH, etc)

Post-polymerisation modification

Polymers in therapeutics

Classic case studies

Degradable and Sustainable Polymers (5 lectures + seminars)

a) Polymers from renewable resources

b) Functional degradable polymers by ring-opening polymerization

c) Degradable polymers in tissue engineering

d) Classic case studies

Polymer Architectures (5 lectures + seminars)

a) Star-shaped and hyperbranched polymers

b) Graft or comb-shaped polymers

c) Dendrimers

d) Classic case studies

Supramolecular Assembly of Polymers (5 lectures + seminars)

a) Methods for poly(peptide) synthesis

b) Secondary and tertiary structure of poly(peptide)s

c) Biologically-inspired self-assembly of macromolecules

d) Classic case studies

An additional review article from each taught area will be provided and supported by a 2 h seminar per article to discuss the content.

An additional contact hour a week will be set aside (as bookable) so that students who have

concerns with directed reading and student centered learning can discuss their problems with an academic on a one to one or group basis.

Learning outcomes

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

- Understand and be aware of current research and problems in the areas of polymer synthetic methods and supramolecular assembly of polymers.
- Use their knowledge to critically evaluate recent research work in any of the areas of study
- disseminate that knowledge by the preparation of a CONCISE written report. (A concise report will test the students ability for communicating/abstracting only the MOST relevant material)
- Show originality in application of their knowledge to solving problems in the three areas of study
- Read and understand published literature reviews
- Use IT to prepare a Presentation

Indicative reading list

[Reading lists can be found in Talis](#)

Subject specific skills

Use their knowledge to critically evaluate recent research work in any of the areas of study
To be able to disseminate that knowledge by the preparation of a concise written report.
Read and understand published literature reviews

Transferable skills

Use IT to prepare a Presentation
Problem-solving

Study

Study time

Type	Required
Lectures	10 sessions of 1 hour (10%)
Private study	90 hours (90%)
Total	100 hours

Private study description

Self-study.

Costs

No further costs have been identified for this module.

Assessment

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

Assessment group D4

	Weighting	Study time	Eligible for self-certification
Assessment component			
Assessed Work Essay	20%		Yes (extension)

Reassessment component is the same

Assessment component			
Written Examination (Locally Held) A 1.5-hour exam, locally held.	80%		No

Reassessment component is the same

Feedback on assessment

Written feedback on assessed work will be given.

[Past exam papers for CH974](#)

Availability

Courses

This module is Core for:

- Year 1 of TCHS-F1PK Postgraduate Taught Polymer Chemistry

This module is Optional for:

- TCHA-F1PW Postgraduate Taught Polymer Science
 - Year 1 of F1PW Polymer Science
 - Year 2 of F1PW Polymer Science

This module is Option list B for:

- Year 1 of TCHA-F1PW Postgraduate Taught Polymer Science