1. **Title of the module**

LABS4130 Introduction to Polymer Chemistry

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

Digital and Lifelong Learning

1. **The level of the module (Level 4, Level 5, Level 6 or Level 7)**

Level 4

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

15 Credits (7.5 ECTS)

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

This module is part of the FdSc and BSc (Hons) in Applied Chemical Sciences being delivered through a part-time distance learning approach.

1. **Prerequisite and co-requisite modules**

None

1. **The programmes of study to which the module contributes**

FdSc and BSc (Hons) in Applied Chemical Sciences

1. **The intended subject specific learning outcomes.  
   On successfully completing the module students will be able to:**
2. Identify common monomers and polymers and name major classes of polymers.
3. Understand and calculate molecular weight averages.
4. Understand basic principles of step-growth & chain-growth polymerisation.
5. Discuss the different types of polymerisation.
6. Discuss the basic methods used to characterise polymers.
7. Understand glass transition and discuss the different types of polymer morphologies/structures.
8. **The intended generic learning outcomes.  
   On successfully completing the module students will be able to:**
9. Demonstrate the development of practical/technical skills.
10. Demonstrate an ability to analyse, evaluate and correctly interpret data.
11. Demonstrate an ability to present and communicate data.
12. Demonstrate an ability to obtain and use information from a variety of sources as part of self-directed learning.
13. Demonstrate time-management and organisational skills within the context of self-directed learning.
14. **A synopsis of the curriculum**

Introduction to polymers (e.g. size, properties, nomenclature).

Step-growth polymerisation (e.g. nylons, polyesters, polycarbonates).

Radical chain polymerisation (e.g. polystyrene, polyacrylates, PVC).

Ionic polymerizations (e.g. polystyrene, poly (vinyl ethers), synthetic rubber).

Characterization techniques (e.g. SEC, DSC, NMR, DMA).

1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**

Kricheldorf, H.R., Nuyken, O. and Swift, G. (2005) *Handbook of polymer synthesis*. 2nd edn. New York: Marcel Dekker.

Mark, J.E. (2007) *Physical properties of polymer handbook*. 2nd edn. New York: Springer.

Rudin, A. and Choi, P. (2013) *The elements of polymer science and engineering*. Waltham, Mass.: Academic.

Brazel, C.S. and Rosen, S.L. (2012) *Fundamental principles of polymeric materials*. Hoboken N.J.: John Wiley & Sons Inc.

Cowie, J.M.G. and Arrighi, V. (2008) *Polymers: Chemistry and physics of modern materials*. Boca Raton: CRC Press.

Peacock, A.J. and Calhoun, A.R. (2006) *Polymer chemistry: Properties and applications.* Munich: Hanser Gardner Publications.

1. **Learning and teaching methods**

* Total Contact Hours: 120
* Private Study Hours: 30
* Total Study Hours: 150

1. **Assessment methods**
   1. Main assessment methods

Essay assignment/s (70%) - 1600 words.

Moodle Quiz (30%).

The pass mark for this module is 40%. The aim of the assessment is that there should be an equal balance between ‘application’ (i.e. reflection related to practical/work experience) and ‘theory’ (i.e. examination), but that neither should enable the student to obtain a pass grade independently and in its entirety.

13.2 Reassessment methods

Like for Like

1. ***Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section12) and methods of assessment (section 13)***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 8.6 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |  |
| **Teaching** | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Work-based experience |  |  |  |  |  |  | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |
| Essay assignment/s | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Moodle Quiz | **x** | **x** | **x** | **x** | **x** | **x** |  |  |  |  |  |

1. **Inclusive module design**

The *division* recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Distance, Medway

1. **Internationalisation**

Introduction to Polymer Chemistry is a core component of the Pharmaceutic R & D industry and reflects international aspects.

**DIVISIONAL USE ONLY**

**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
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