

Module Details	
Module Title	Colloids and Interfaces
Module Code	CFS7036-B
Academic Year	2023/4
Credits	20
School	School of Chemistry and Biosciences
FHEQ Level	FHEQ Level 7

Contact Hours	
Type	Hours
Online Lecture (Asynchronous)	15
Lectures	20
Tutorials	5
Tutorials	5

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 1

Module Aims
<p>This module will draw together organic chemistry, inorganic chemistry and physical chemistry at an advanced level in the study of colloids and interfaces. An introduction to the principles and practice of colloid science and interfaces will be followed by examining the stability, structure and texture of emulsion based systems. Terminology and concepts of colloid science, including aggregation, flocculation and gelation, will also be covered. In addition, the role of emulsifiers, hydrocolloids and stabilising agents and foam formation will be examined.</p> <p>The application of colloidal particles in modern innovations, such as recent literature regarding polymer self-assembly, will be discussed. Students will also study interactions at surfaces and interfaces, interfacial energies that govern vesicle/micelle formation, and practical applications of these phenomena, e.g. surface catalysis and micellar synthesis.</p>

Outline Syllabus

Introduction to Colloids and Interfaces: Derjaguin-Landau-Verwey-Overbeek (DLVO) theory. Colloidal stability: flocculation, aggregation and gelation. Polymers in disperse media. Interfaces: surface interactions, interfacial energies, vesicle and micelle formulation, micellar synthesis. Emulsion types: water-in-oil, oil-in-water, microemulsions, structure/function relationships. Application of colloidal systems in medicine, general chemical science and formulation science, e.g. cosmetic formulation, dairy and industrial and pharmaceutical coatings. Characterisation of colloidal systems: analysis of stability, particle size and nature of dispersions using a combination of scattering and spectroscopic techniques.

Learning Outcomes

Outcome Number	Description
01	Demonstrate a comprehensive and mechanistic understanding of the physicochemical characteristics of colloids, polymer self-assembly and interfaces.
02	Discuss and describe the complex interactions governing the physical behaviour of mixed-phase solutions due to interfacial factors.
03	Explain and critically discuss the physicochemical properties of macromolecules and justify their utilisation in a range of commercial applications.
04	Demonstrate breadth, depth of awareness and understanding of the chemistry of organic and inorganic particle interactions.
05	Demonstrate breadth and depth of understanding of the analysis and characterisation of formulations and communicate findings in writing, observing appropriate professional conventions in chemistry.
06	Critically evaluate and select data and literature sources based on accuracy and relevance to a selected topic in colloids and interfaces.

Learning, Teaching and Assessment Strategy

Lectures will deliver core content and provide students with the opportunity to enhance their knowledge and understanding of inorganic, organic and physical chemistry within the context of colloids and interfaces. Lectures will be complemented tutorials to allowing the application of this learning to specific topic areas and problems. A summative examination will assess understanding of the core content.

Students will research the literature and prepare an individually assessed report

The VLE will be used to provide access to online resources, lecture notes and external links to websites of interest. Directed study will provide students with the opportunity to undertake guided reading and develop indepth understanding of the subject material. During directed study hours, students are expected to undertake reading to consolidate and expand on the content of formal taught sessions. Directed study should include research and preparation for assessments and revision of material from the formal taught sessions.

Assessment 1: A summative examination will cover LOs 1-4.

Assessment 2: A written report will cover LOs 1-6.

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Examination - Closed Book	Summative Assessment: Closed Book Examination (2 Hrs)	50%
Summative	Coursework - Written	Scientific Report (2000 words)	50%

Reading List
To access the reading list for this module, please visit https://bradford.rl.talis.com/index.html

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

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