UNIVERSITY of BRADFORD

Module Descriptor

Practical Chemistry 2

Module Code:	CFS5019-D
Academic Year:	2018-19
Credit Rating:	40
School:	School of Chemistry and Biosciences
Subject Area:	Chemistry
FHEQ Level:	FHEQ Level 5
Module Leader:	Dr Rianne Lord

Additional Tutors:
Dr Philip Drake

Pre-requisites:	Practical Chemistry 1 2017-18
Co-requisites:	

Contact Hours

Type	Hours
Tutorials	5
Laboratory	168
Directed Study	227

Availability Periods

Occurrence	Location/Period
BDA	University of Bradford / Academic Year (Sept - May)

Module Aims

This module builds on practical chemistry 1 and aims to enhance your synthetic and analytical techniques. You will further develop your skills for the synthesis of organic and inorganic compounds by employing multi-step reactions. You will also apply advanced spectroscopic techniques for the structure elucidation of reaction products n and grasp an understanding of their physical properties.

You will extend your laboratory skills to considering the methods required for nanoscience, electrochemistry, colligative properties, crystallisation and computational chemistry. You will develop your professional and transferable skills through the means of group work, presentations and CV workshops.

Through pre-laboratory material, MCQ and COSHH assessment, laboratory write-ups, laboratory vivas and group work, you will develop your understanding and appreciation of practical chemistry, enabling you to link these practical skills into the other core curriculum modules and learn their importance within industrial applications.

Outline Syllabus

1. Design of multi-step reactions, with an understanding of conversion and yields
2. Introduction to the synthesis of coordination compounds, with analysis of isomerism using analytical techniques
3. Enhance the understanding and use of UVvis spectroscopy for the understanding of Crystal Field and Ligand Field Theory.
4. Understand the importance of NMR techniques in the analysis of industrially relevant molecules.
5. Learn the theory and concepts relating to powder X-ray diffraction and attend a workshop on Bragg's Law.
6. Monitor process-induced changes within a pharmaceutical system using vibrational spectroscopy.
7. Demonstrate the concepts in states of matter and determination of thermodynamic parameters.
8. Illustrate the concepts of thermodynamic and kinetic control in organic reactions.
9. Understand the reduction of metals using various reduction techniques.
10. Using separation techniques to understand the concepts of ion exchange.
11. Using synthetic techniques and mass spectrometry to understand carbonyl chemistry.
12. Manipulating diazo-compounds to generate substituted aromatic compounds from commercially available or straight forward aromatic amines.
13. Understand the use of computational methods to illustrate the theoretical basis of organic reaction mechanisms .
14. An introduction to nanoscience and to grasp an understanding of versatility of nano-particles within industrial applications.
15. Undertake experiments to gain an understanding of phase equilibria/colligative properties.
16. Illustrate what electrochemistry is and provide a practical introduction to the basic terms and concepts.
17. To undertake a 4 week group project with a topic relating to either research and/or industry
18. Communication skills, both written and oral, and use problem-solving skills relating to qualitative and quantitative information.
19. Enhance interpersonal skills to be attending workshops of CV and cover letter writing. Your interpersonal skills will also be enhanced by presenting your work both written and orally.

Module Learning Outcomes

On successful completion of this module, students will be able to...

1 Demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to the subject areas.

2 Apply knowledge and understanding to the solution of qualitative and quantitative problems.

3 Time management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working.

4 Development of interpersonal skills. relating to the ability to interact with other people and to engage in team working. and present the work as part of a team.

5 Perform multistep preparative syntheses and characterise characterisation of the products through advanced analytical techniques.

6 Implement core chemistry knowledge to grasp the concepts of various analytical and measurement techniques.

7 Analyse and interpret spectroscopic data and use a range of tools for the data output.

8 Enhance the skills required for effective documentation of laboratory procedures involved in synthetic and analytical work.

9 Demonstrate the use of information technology (IT) and data-processing skills, relating to chemical information and data.

10 Critically evaluate e. choose and carry out appropriate analytical methods arguments. assumptions and data to make judgements and conclusions.

11 Communicate scientific ideas. problems and solutions effectively through individual write ups and group work.

Learning, Teaching and Assessment Strategy

Pre-laboratory lectures, will deliver core content: providing you with the opportunity to acquire the information to enhance your knowledge and understanding of the practical This will be complemented by online reading material and an MCQ/COSHH assessment. which must be completed with >80% before entry into the laboratory, The laboratory-based work will include staff-led demonstrations of practical and manipulative skills at the bench. and this is to include supervision of students' practical work. All laboratory books are to be written during the laboratory sessions and signed off by a member of staff before the session is over. ;reaching of health and safety and laboratory skills will be delivered in workshops and no student will be allowed to enter the laboratory without completing the MCO/COSHH assessments. Students will receive feedback in the form of marked laboratory reports. review of laboratory records. oral vivas and group work/presentations. Workshops will be used to develop reflective practice. and for developing professional attributes in CV and cover letter writing.

Semester 1 will have 5 weeks of synthesis experiments. 5 weeks of measurement experiments and 2 weeks of group work. Semester 1 assessments: MCQ/COSHH, laboratory write-up oral viva, group work and laboratory book check.

Semester 2 will have 4 weeks of synthesis experiments. 4 weeks of measurement experiments and 4 weeks of group work. with the final week including a group presentation. Semester 2 assessments: MCQ/COSHH. laboratory write-up, oral viva. group work and laboratory book check.

Directed study provides you with the opportunity to undertake guided reading and to develop your own portfolio of learning to enhance transferable skills and knowledge relating to evaluation of your own role and subject provision.

The VLE will be used to provide access to online resources. pre-laboratory material. COSHH forms,
MCQ/COSHH assessments, and external links to websites of interest.

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
Summative	Coursework	Continuous summative assessment of practical work and reports	0-7000 words	90%	Yes
Summative	Coursework	Produce a CV, cover letter and a skills audit	0-2000 words	10%	No

Legacy Code (if applicable)

CT-2028K

Reading List

To view Reading List, please go to **rebus:list**.