

Practical Chemistry for Apprentices 1

Module Code:	CFS4031-C
Academic Year:	2018-19
Credit Rating:	30
School:	School of Chemistry and Biosciences
Subject Area:	Chemistry
FHEQ Level:	FHEQ Level 4
Module Leader:	Dr Thomas Swift

Additional Tutors:
Alan Hague

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Work based learning	220
Tutorials	10
Laboratory	40
Directed Study	30

Availability Periods

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

Module Aims

You will be trained in the application of quality standards and in the design, use, and monitoring of risk-management systems. You will develop your skills in the safe handling of chemicals, in making accurate qualitative observations, quantitatively analysing compounds prepared in the laboratory, and in reporting and interpreting experimental results. You will learn about spectroscopic techniques and use these methods in the analysis of what you

synthesise in the lab. Through preparing laboratory reports you will be introduced to the standard formats and drawing packages used by professional chemists to share their results. You will be tutored in the basic numeracy skills necessary to study a degree in the chemical sciences, and will apply these skills to your experimental work.

The principles of Green Chemistry will be introduced, and you will learn how to assess the environmental impact of your laboratory work.

Outline Syllabus

Chemical hazards and risk assessments, sources of safety data, on-line databases, definitions and safety terms, exposure limits, legislation, CHIP, COSHH, REACH. Data manipulation & presentation of results. Precision, accuracy & sensitivity, linear regression, units. Experimental errors & calibration. Validation of data. Statistical methods. Reporting & interpreting experimental results. Quantitative & qualitative measurements, Algebra, Differential calculus, Integral calculus, Trigonometry. Green chemistry - Definitions & metrics used, the tools used to assess the environmental impact of chemical processes.

Laboratory techniques in separating organic mixtures: Elementary organic synthesis.

Spectroscopic characterisation of organic & inorganic compounds.

Professional Development: Presenting information effectively, monitoring & evaluating results, drawing conclusions, chemical reports, chemical structure drawing.

Maths Skills: Formative and summative online assessments in maths abilities, with online material provided for student development.

Module Learning Outcomes

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

- 1 Devise and manage a Chemical Skills E-Portfolio
- 2 Describe types of chemical hazards, carry out simple COSHH assessments, apply quality standards.
- 3 Use IT to prepare professional chemical documentation.
- 4 Demonstrate time and project management skills. Be able to plan and complete works to a schedule.
- 5 Describe principles and methods, and carry out experiments in; organic purification and organic and main group synthesis.
- 6 Record experimental lab work in the appropriate format;
- 7 Manipulate mathematical equations
- 8 Identify and quantify experimental errors
- 9 Evidence practical skills developed through on-the-job training

Learning, Teaching and Assessment Strategy

The introductory summer school will include laboratory-based work with staff-led demonstration of practical and manipulative skills at the bench and supervision of students'

experimental work.

The summer school will also have taught components to cover Health and Safety and laboratory management, the reporting of laboratory work, handling of data, and the use of spectroscopic techniques.

Students will be introduced to the e-portfolio system they will use for recording the techniques they develop on-the-job throughout the academic year.

After the summer school, the student will meet with their supervisory team to discuss the practical skills and techniques that will be developed in the workplace during that year. A skills development plan will be designed and implemented.

The supervisory team will monitor the development of the e-portfolio throughout the year and will identify if there are any additional learning requirements to meet the module learning outcomes.

At distance on-line seminars will be used to provide further instruction in fundamental spectroscopic techniques used in the lab, mathematical skills, and to give instruction in the use of specialist software for the preparation of laboratory reports.

Students will have the opportunity to build an e-portfolio of skills and knowledge to evidence their progression in the practical aspects of the chemical sciences. Laboratory work will be assessed via continuous assessment of the student's laboratory practices.

Assessment 1: Written and oral report based on Summer School Practical work, tests LO 3,5,6,8.

Assessment 2: An on-line maths assignment, to test LO 7. A diagnostic maths formative assessment will be given to students at the start of the module. Students who require extra tuition in maths will be required to engage with further maths teaching materials.

Assessment 3: An e-portfolio where students will evidence their practical skills development. This assessment will be facilitated by the supervisory team. Formative feedback will be given throughout the year prior to final submission. Tests LO 1, 2, 4, 9

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
Summative	Laboratory Report	Written and oral report based on Summer School Practical work	0-1000 words	25%	No
Summative	Coursework	e-portfolio of Chemistry skills and knowledge developed through year	0-5000 words	50%	Yes
Formative	Coursework	e-portfolio of Chemistry skills		%	No

		and knowledge developed through year			
Formative	Coursework	Formative laboratory report		%	No
Formative	Computer-based assessment	Formative online diagnostic test on mathematical skills		%	No
Summative	Computer-based assessment	Data handling and mathematical skills	2 hours	25%	No

Legacy Code (if applicable)

Reading List

To view Reading List, please go to [rebus:list](#).