UNIVERSITY of BRADFORD

Faculty of Life Sciences

Programme Specification

Programme title: BSc Chemistry (Apprenticeship)

Academic Year:	2018/19
Degree Awarding Body:	University of Bradford
Final and interim award(s):	BSc (Honours) Chemistry [Framework for Higher Education Qualifications (FHEQ) level 6] Diploma of Higher Education [Framework for Higher Education Qualifications (FHEQ) level 5] Certificate of Higher Education [Framework for Higher Education Qualifications (FHEQ) level 4]
Programme accredited by:	Subject to The Royal Society of Chemistry
Programme duration:	4 Years Part Time
UCAS code:	
QAA Subject benchmark statement(s):	Chemistry (2015)
Date of Senate Approval:	
Date last confirmed and/or minor modification approved by Faculty Board	

Introduction

The University of Bradford's key mission statement is 'Making Knowledge Work'. The BSc Chemistry (Apprenticeship) programme is directly aligned with this message of meshing the academic with real-world outputs. This degree will give apprentices a solid background in the chemical sciences, but will also focus on the application of chemistry in specific areas of this 'central science'. Whilst they are studying, apprentices on this programme will be applying their knowledge in their companies and developing practical and theoretical skills through their work.

Our degrees have been structured to give apprentices choice and flexibility. During the first two stages, apprentices will develop a sound understanding of theoretical and practical aspects of chemistry, with core content delivered across the traditional areas of organic, inorganic and physical chemistry. Further to this, apprentices will have the chance to pick elective modules that have been developed in collaboration with industry. These elective modules will provide a direct link between the apprentice's core learning and the application of chemistry in their industrial area.

As a Bradford Chemistry graduate, apprentices will be uniquely placed to deploy the skills that have developed across the programmes to 'Make Knowledge Work'.

Programme Aims

The programme is intended to:

- develop an enthusiasm for chemistry and an appreciation of its application in different contexts
- provide opportunities for apprentices to develop a systematic knowledge and understanding of the core principles of chemistry
- develop an understanding of the role of chemists in the chemical and related industries
- enable apprentices to develop a core range of chemistry-related practical skills
- develop apprentices ability to think critically and creatively
- develop collaborative and group working skills
- develop awareness of sustainability in the context of the chemical sciences
- extend apprentices comprehension of key chemical concepts and provide an in-depth understanding of applied areas of chemistry
- provide a supportive educational environment, which meets the needs of apprentices from a variety of backgrounds
- enable apprentices to become autonomous learners and prepare apprentices for the lifelong learning skills required to be adaptable over the course of their career
- enable apprentices to develop the ability to carry out experiments independently and assess the significance of their outcome
- develop the ability to adapt and apply methodology to the solution of unfamiliar problems
- instil a critical awareness of advances at the forefront of the chemical sciences

Programme Learning Outcomes

To be eligible for the award of Certificate of Higher Education at FHEQ level 4, apprentices will be able to:

LO1	Describe the physical world using the language of chemistry.
LO2	Describe chemical reactions in terms of the change in structure of organic and inorganic compounds and materials, and in the change of measurable physical attributes of these.
LO3	Describe the underlying scientific principles, principal theories, concepts and terminology of laboratory based experimentation, including laboratory techniques relevant to the specialist discipline.
LO4	Describe the application of quality standards, safe working practices and compliance with risk management systems relevant to the workplace in their own work and in the work of others.
LO5	Work collaboratively to analyse a given problem, and to prepare a presentation.
LO6	Recognise the importance of integrity, respect, compliance and confidentiality in the workplace.
LO7	Explain the business environment in which the apprentice's company operates including their personal role within the organisation, ethical practice and codes of conduct.
LO8	Manage time effectively, being able to plan and complete work to schedule

Additionally, to be eligible for the award of Diploma of Higher Education at FHEQ level 5, apprentices will be able to:

LO9 Interpret the structure and reactivity of organic and inorganic molecules and compounds by considering appropriate bonding models.

LO10 Discuss the way in which organic and inorganic compounds react at a molecular level with emphasis on mechanistic tools of interpretation.

LO11 Explain physical processes, both in terms of classical thermodynamics and in terms of the quantisation of energy.

LO12 Interpret the results of practical experiments, commenting specifically on the significance and quality of the associated data produced.

LO13 Evaluate their skill sets against subject-specific requirements and identify areas for professional and personal development.

LO14 Establish a collaborative approach to tackling problems and in the implementation of change management processes.

LO15 Identify and use the scientific approaches appropriate to the specialist discipline required to solve problems, support new investigations and follow-up experiments in the laboratory.

LO16 Compare different process mapping and analysis tools for performance improvement within the scientific and technical environment.

Additionally, to be eligible for the award of Ordinary Degree of Bachelor at FHEQ level 6, apprentices will be able to:

LO17 Accurately apply the range of theories contained within the sub-disciplines of organic, inorganic and physical chemistry to interdisciplinary areas of the chemical sciences.

Additionally, to be eligible for the award of Honours Degree of Bachelor at FHEQ level 6, apprentices will be able to:

LO18 Examine the internal and external regulatory environment and the needs of internal and external customers pertinent to the area of specialisation.

LO19 Develop a cohesive strategy for the implementation of a technical project, with a focus on the utilisation of data sources, team working, and project planning and experimental design.

LO20 Use mechanistic concepts to rationalise and discuss the outcome of complex reactions.

LO21 Communicate effectively to a scientific and non-scientific audience using oral presentation, scientific debate and technical writing skills.

Curriculum

Year 1

FHEQ Level	Module Title	Type (Core/	Credits	Semester (s)	Module Code

		Option)			
4	Organic Chemistry 1(at distance)	Core	20	1 + 2	
4	Inorganic Chemistry 1(at distance)	Core	20	1 + 2	
4	Study Skills for Apprentices	Core	20	1 + 2	
4	Practical Chemistry for Apprentices 1	Core	30	1 + 2	

At the end of Year 1, apprentices will be eligible to exit with the award of Certificate of Continuing Education if they have successfully completed at least 20 credits.

Year 2

FHEQ Level	Module Title	Type (Core/ Option/ Elective)	Credits	Semester	Module Code
4	Physical Chemistry 1(at distance)	Core	20	1 + 2	
5	Organic Chemistry 2(at distance)	Core	20	1 + 2	
5		Elective	20		
5	Practical Chemistry for Apprentices 2	Core	30	1 + 2	

At the end of Year 2, apprentices will be eligible to exit with the award of Certificate of Higher Education if they have successfully completed at least 120 credits and achieved the award learning outcomes.

Year 3

FHEQ Level	Module Title	Type (Core/ Option/ Elective)	Credits	Semester	Module Code
5	Physical Chemistry 2 (at distance)	Core	20	1 + 2	
5	Inorganic Chemistry 2 (at distance)	Core	20	1 + 2	
5		Elective	20		
6	Practical Chemistry for Apprentices 3	Core	30	1 + 2	

At the end of Year 3, apprentices will be eligible to exit with the award of Diploma of Higher Education if they have successfully completed at least 240 credits and achieved the award learning outcomes.

Year 4

FHEQ Level	Module Title	Core/ Option	Credits	Semester	Module Code
6	Organic Chemistry 3 (at distance)*	Option	20	1	
6	Introduction to Polymer and Colloid Science (at distance)*	Option	20	1	
6	Bio-organic and Bio-inorganic Chemistry (at distance)*	Option	20	2	
6	Molecular Analysis (at distance)*	Option	20	2	
6	Work based Research Project	Core	30	2	

Option* - Apprentices must choose three from four of these options

Apprentices will be eligible to exit with the award of Ordinary Degree of Bachelor if they have successfully completed at 120 credits in both Level 4 and 5 and 60 credits at level 6 and achieved the award learning outcomes.

Apprentices will be eligible for the award of Honours Degree of Bachelor if they have successfully completed at least 360 credits and achieved the award learning outcomes.

Placement and/or Study Abroad

This programme does not provide the option for apprentices to undertake an additional work placement or period of study abroad.

Learning and Teaching Strategy

Apprentices on this programme will be engaged on an apprenticeship in a chemical (or related) company. Each apprentice will be assigned a supervisory team to consist of one member of academic staff, and one member of staff from the apprentice's company. This supervisory team will work with the apprentice to support their study, and to help develop and document the practical skills that the apprentice will gain within their company. In the final year the supervisory team will support the research project. The supervisory team will closely monitor each apprentice's progress, through twice-yearly formal face-to-face meetings, and through more regular contact.

Each Year of study will commence with a residential summer school. These summer schools will be used to deliver key practical skills in support of the practical chemistry modules, and in year 4, for the final research project. Additionally, the year 1 Summer School will introduce apprentices to the study skills required to engage with the 'at distance' parts of the programme. The summer schools will also

allow apprentices to meet their cohort and tutors, and this will help reinforce the learning community which apprentices will engage with when studying the 'at distance' material.

The 'at distance' parts of the programme will generally be delivered using a 'flipped teaching' approach. This means that taught material will need to be studied before the class takes place. This material will be presented in a range of media including podcasts, vodcasts and directed reading. The majority of classes will be hosted and facilitated online using collaborative software where apprentices and their course tutor will meet for regular timetabled sessions. These sessions will require apprentices to use the knowledge they have gained through completion of the pre-work and apply it to real world problems. Furthermore, the problems will require apprentices to take a collaborative approach to solving them, enabling them to develop their employability skills in a peer-learning environment. This part of the teaching strategy will address Programme Learning Outcomes 1-3, 5-7, 9-11, 17 and 19.

Core practical skills will be developed in the residential summer school. Lectures in laboratory management and technique will be taught alongside intensive practical classes. Practical skills will be further developed in the apprentice's work-place. The supervisory team will regularly assess these skills and will facilitate the apprentice in evidencing them against defined capabilities using an on-line portfolio. This part of the course will address Programme Learning Outcomes 4, 8, and 12-16.

The individual project in year 4 will require the apprentice to engage in-depth with an aspect of research within their workplace. This project will be supported by the apprentice's supervisory team and will address Programme Learning Outcomes 18 and 19.

Assessment Strategy

Apprentices will demonstrate their achievement via written closed-book examinations using constructed (essays, short answers) and selected response (MCQ) questions and a variety of coursework assignments, including laboratory reports, oral presentations and dissertations.

The development of learning outcomes 3, 4, 6, 10 20, 23 and 24 will be through involvement in laboratory, small-group workshops, case-based work and projects (individual and small group). They will be assessed by critical appraisal, case analysis and critique, case presentations, laboratory reports and dissertations

Assessment Regulations

This Programme conforms to the standard University Assessment Regulations

http://www.bradford.ac.uk/aqpo/ordinances-and-regulations/

but with the following changes:

- Compensation and referral are not permitted
- Criteria relating to progression between years, entitlement to supplementary assessment and performance in supplementary assessment are bespoke because of the structure of the programme (90 credits per year over four years). Full details can be found in the BSc Chemistry (Apprenticeship) Bespoke Regulations at: [weblink to be inserted]

Admission Requirements

The University welcomes applications from all potential apprentices and most important in the decision to offer a place is our assessment of a candidate's potential to benefit from their studies and of their ability to succeed on this particular programme. Consideration of applications will be based on a combination of formal academic qualifications and other relevant experience.

The **minimum** entry requirements for the programme are as follows:

A typical offer to someone seeking entry through the UCAS scheme would be 112 UCAS points (old tariff 280 points).

The UCAS **tariff** applicable may vary and is published here

www.brad.ac.uk/chemistry

Applications are welcome from apprentices with non-standard qualifications or mature apprentices (those over 21 years of age on entry) with significant relevant experience.

On completion of a UCAS form apprentices will be invited to the School for an Open Day when they will have the opportunity to meet staff, view the facilities and discuss "the Bradford experience" with current apprentices.

Recognition of Prior Learning

If applicants have prior certificated learning or professional experience which may be equivalent to parts of this programme, the University has procedures to evaluate and recognise this learning in order to provide applicants with exemptions from specified modules or parts of the programme.

Minor Modification Schedule

Version Number		
1		