**Programme Specification**

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| **Please note:** This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she passes the programme. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the programme handbook. The accuracy of the information contained in this specification is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education. |

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| **BSc Applied Chemical Sciences for Laboratory Scientists** |

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| 1. **Awarding Institution/Body**
 | University of Kent |
| 1. **Teaching Institution**
 | University of Kent  |
| 1. **School responsible for management of the programme**
 | CHDA |
| 1. **Teaching Site**
 | Medway, Canterbury, Employer |
| 1. **Mode of Delivery**
 | Part-time blended learning Work-based learning |
| 1. **Programme accredited by**
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| 1. **a) Final Award**
 | BSc (Hons)  |
| 7. **b) Alternative Exit Awards**  | BSc (non hons) Applied Chemical Sciences for Laboratory Scientists; FdSc in Applied Chemical Sciences for Laboratory Scientists;Certificate in Applied Chemical Sciences for Laboratory Scientists  |
| 1. **Programme**
 | Applied Chemical Sciences for Laboratory Scientists |
| 1. **UCAS Code (or other code)**
 | N/A |
| 1. **Credits/ECTS Value**
 | 360 credits (180 ECTS) |
| 1. **Study Level**
 | Undergraduate |
| 1. **Relevant QAA subject benchmarking group(s)**
 | Chemistry 2014 |
| 1. **Date of creation/revision**
 | Feb 2017/revised FSO Jan 2018 |
| 1. **Intended Start Date of Delivery of this Programme**
 | September 2018 |

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| 1. **Educational Aims of the Programme**

The programme aims to: |
| * Instil in students a sense of enthusiasm for learning which may lead to continuing professional development or pathways for lifelong learning.
* Produce graduates equipped with the skills to play an enhanced role in the Pharmaceutical and Chemical Sciences Industry, nationally.
* Educate students in the theoretical (subject specific knowledge) and practical (laboratory based) aspects of the chemical sciences which relate to current and future employment needs.
* Provide students with the skills to adapt and respond positively to new developments in the workplace.
* Develop the critical, analytical, problem based learning skills required by the students in the workplace.
* Develop student’s competences in a broad range of areas relevant to their current and future employment.
* Enhance and develop the student’s interpersonal skills.
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| **16 Programme Outcomes**The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have references to the subject benchmarking statement for Chemistry 2014 (SB).The programme outcomes also relate to the Foundation Degree benchmark 2010 (FdB). For more information on the skills provided by individual modules and on the specific learning outcomes see the module mapping. |

**A. Knowledge and Understanding of:**

1. A broad-based core covering the major elements (inorganic, organic and physical chemistry), together with specialised in-depth study (often career related) of some aspects of the subject areas (SB7.1, SB7.2.1, SB7.3.1)
2. Information and data, their setting within a theoretical framework, accompanied by critical analysis and assessment to enable understanding of the subject area (SB7.1, SB7.2.1, SB7.3.1)
3. A familiarity with terminology, nomenclature and classification systems (SB7.1, SB7.2.1, SB7.3.1)
4. Methods of acquiring, interpreting and critically analysing chemical information through the use of texts, original papers, reports and data sets (SB7.1, SB7.2.1 – SB7.2.4)
5. A range of communication techniques and methodologies relevant to the particular discipline and the workplace (SB7.2.4, SB7.3.4, FdB 42)
6. How to engage with some of the current developments in the chemical sciences and their applications, including the philosophical and ethical issues involved (SB7.1, SB7.2.4, SB7.3.4)
7. The capacity to give a clear and accurate account of a subject, marshal arguments in a mature way and engage in debate and dialogue both with specialists and non-specialists, using appropriate scientific language (SB7.1, SB7.2.4, SB7.3.4)
8. How to think independently, set tasks and solve problems (SB7.2.2, SB7.2.4, SB7.3.2, SB7.3.4, FdB 43)
9. The applicability of the chemical sciences to their careers (SB7.1)
10. How to successfully apply, in the workplace, the range of knowledge and skills learnt through the programme (SB7.1, SB7.2.2, SB7.2.3, SB7.3.2.3, FdB 42,43)
11. How to apply underlying concepts and principles outside the context in which they were first studied and the application of those principles in a work context (SB7.1, SB7.2, SB7.3)
12. Critical evaluation of the appropriateness of different approaches to solving problems in their field of study and application of these in a work context (SB7.1, SB7.2.2, SB7.3.2).

**Skills and Other Attributes**

**B. Intellectual Skills:**

1. The ability to recognise and apply subject-specific theories, paradigms, concepts or principles (SB7.1, SB7.2.1, SB7.2.2, SB7.3.1, SB7.3.2, FdB 42)
2. The ability to synthesise, analyse and summarise information critically, including published research or reports (SB7.1, SB7.2.4, SB7.3.4, FdB 42, 43)
3. The ability to obtain and integrate several lines of subject-specific evidence to formulate and test hypotheses (SB7.1, SB7.2.2, SB7.3.2)
4. The application of subject knowledge and understanding to address both familiar and unfamiliar problems (SB7.1, SB7.2.2, SB7.3.2)
5. The ability to recognise moral and ethical issues together with the appreciation of professional codes of conduct (SB7.1)
6. An ability to develop and utilise effective project management skills (SB7.2.4, SB7.3.4)
7. The ability to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis in their field of study and in a work context (SB7.1, SB7.2.2, SB7.3.2, FdB 42, 43).

**C. Subject-specific Skills:**

1. Sufficient practical ability to ensure competence in the appropriate basic experimental skills (SB7.2.3, FdB 42, 43)
2. The ability to design, plan, conduct and report on investigations, which may involve primary or secondary data, arising from individual or group projects (SB7.1, SB7.2, SB7.3, FdB 42, 43)
3. The ability to obtain, record, collate and analyse data using techniques appropriate to their work (SB7.1, SB7.2.3, SB7.3.3, FdB 42, 43)
4. The ability to undertake an extensive work-based Business project and Laboratory research projects in a responsible, safe and ethical manner, paying due attention to relevant health and safety guidelines/procedures, e.g. COSHH (SB7.1, SB7.2, SB7.3, FdB 42, 43, 44)
5. The ability to identify and undertake training to develop existing skills and acquire new competences that will enable them to assume responsibility within their organisation (SB7.2.4, SB7.3.4, FdB 42, 43, 44)

**D. Transferable Skills:**

1. The ability to use the internet and other electronic sources critically as a means of communication and a source of information (SB7.2.4, SB7.3.4, FdB 42)
2. A working knowledge of how to cite and reference work in an appropriate manner, including the avoidance of plagiarism (SB7.2.4, SB7.3.4, FdB 42)
3. An ability to effectively communicate information, arguments and analysis, in a variety of forms, to specialist and non-specialist audiences (SB7.2.4, SB7.3.4, FdB 42)
4. Develop numeracy skills and have a working appreciation of the terms: validity, accuracy, calibration, precision & replicability (SB7.1, FdB 42)
5. Extensive experience of solving problems by a variety of methods, including the use of computers (SB7.1, SB7.2.2 – SB7.2.4, SB7.3.2 – SB7.3.4, FdB 42)
6. An ability to recognise and respect the views and opinions of other team members and develop good negotiating skills (SB7.2.4, SB7.3.4, FdB 42)
7. The ability to evaluate one’s performance as an individual and a team member as well as being able to assess the performance of others (SB7.2.4, SB7.3.4, FdB 42)
8. Develop an adaptable, flexible and effective approach to study and work (SB7.2.4, SB7.3.4, FdB 42)
9. Develop the qualities and skills necessary for employment and progression requiring the exercise of personal responsibility and decision making (SB7.2.4, SB7.3.4, FdB 42)

**Teaching/learning and assessment methods and strategies used to enable the programme learning outcomes to be achieved and demonstrated**

Teaching/Learning

The programme will be taught as a 4.5-year work-based, distance learning programme. It is intended that this programme will involve extensive use of e-learning materials, which include theoretical content in the form of storyboards, video, links to related reading and activities with feedback provided.

Students will be required to produce a Reflective Portfolio online; this will act as a record of all learning. The emphasis of the programme is to link the knowledge and learning to work-based learning and employment wherever possible. Problem-solving scenarios will allow students to develop skills in applying knowledge from different parts of the programme and the work place to complex situations. Students will be expected to gain experience of working as a part of a team in the workplace and to effectively utilise their skills and knowledge in this setting. The Business-Based and Laboratory Research Projects provide extended periods of time to investigate an aspect of science or technology in detail using the knowledge and skills acquired during the programme.

Whilst most material will be in the form of directed self-learning, it is essential that the student has regular contact online and/or by telephone with the tutors. Ongoing feedback will be provided for development of the Reflective Portfolio. It is also critical that the workplace supervisor/mentor is able to provide regular contact and support for the student. This allows the opportunity for students to apply their knowledge and understanding in a work-based setting.

Both "hands-on" practical skills and broader skills including numeracy, IT and communication will be taught. Practical experience in the work place will be essential to develop and enhance these skills. A summer school in both the first and second year of the programme will be used to provide more "hands-on" teaching and experience of techniques/skills that are not available at work or locally.

Transferable skills will be embedded within modules, commencing in year one of the programme and a becoming enhanced in the later years. Students will “learn by doing” with an emphasis on work-based learning. There will be many opportunities for problem solving, presentations and written reports, thus providing the opportunity to enhance communication skills.

Assessment

Formal summative assessment assessed against the learning outcomes via written examinations and multiple choice quizzes, portfolio, coursework assignments, written assignments, problem solving, presentations, laboratory participation and performance and the company-based/hypothesis-driven research project reports.

Practical skills will be assessed, both formatively and summatively, through practical tests/assessments at the University or in the work place, reports or other documentation (e.g. Standard Operating Procedures [SOPs]), oral and written presentations, project plans and the Business-Based/Laboratory Research Project reports.

Formal summative assessment assessed against the learning outcomes via written examinations and multiple choice quizzes, portfolio, coursework assignments, written assignments, problem solving, presentations and reports arising from the Business-based and Laboratory research projects.

Transferable skills will be assessed through presentations, case studies, portfolio entries, project plans and the Business-Based/Laboratory Research Project reports.

Formal summative assessment assessed against the learning outcomes via written examinations and multiple choice quizzes, portfolio, coursework assignments, written assignments, problem solving, presentations and the Business-based/Laboratory research project reports.

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| For more information on the skills developed by individual modules and on the specific learning outcomes associated with any Certificate, FdSc or BSc non-honours awards relating to this programme of study, see the module mapping table, located at the end of this specification.  |

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| **17 Programme Structures and Requirements, Levels, Modules, Credits and Awards**This programme is studied over four and a half years in distance learning mode. The programme is divided into three stages, each stage comprising modules to a total of 120 credits. Students must successfully complete each module in order to be awarded the specified number of credits for that module. One credit corresponds to approximately ten hours of 'learning time' (including all classes and all private study and research). Thus obtaining 120 credits in an academic year requires 1,200 hours of overall learning time. For further information on modules and credits refer to the Credit Framework at <http://www.kent.ac.uk/teaching/qa/credit-framework/creditinfo.html> Each module and programme is designed to be at a specific level. For the descriptors of each of these levels, refer to Annex 2 of the Credit Framework at <http://www.kent.ac.uk/teaching/qa/credit-framework/creditinfoannex2.html>. To be eligible for the award of an honours degree students must obtain 360 credits, at least 210 of which must be at Level 5 or above, including at least 90 credits at level 6 or above at Stage 3.Students successfully completing Stages 1 and 2 of the programme, and meeting credit framework requirements, who do not successfully complete Stage 3 will be eligible for the award of FdSc.Students successfully completing Stage 1 of the programme and meeting credit framework requirements who do not successfully complete Stage 2 will be eligible for the award of the Certificate in Applied Chemical Sciences for Laboratory Scientists. Students successfully completing Stage 1 and Stage 2 of the programme and meeting Credit Framework requirements who do not successfully complete Stage 3 will be eligible for the award of the FdSc in Applied Chemical Sciences for Laboratory Scientists. Students successfully completing Stage 2 of the programme and achieving 300 credits overall including at least 60 credits at level 6 or above in Stage 3 and meeting Credit Framework requirements will be eligible for the award of a BSc non-honours degree.For further information refer to the Credit Framework at <https://www.kent.ac.uk/teaching/qa/credit-framework/creditinfo.html#exit-awards>. Compulsory modules are core to the programme and must be taken by all students studying the programme. Optional modules provide a choice of subject areas, from which students will select a stated number of modules. Where a student fails a module(s) due to illness or other mitigating circumstances, such failure may be condoned, subject to the requirements of the Credit Framework and provided that the student has achieved the **programme** learning outcomes. For further information refer to the Credit Framework at <http://www.kent.ac.uk/teaching/qa/credit-framework/creditinfo.html>. Where a student fails a module(s), but has marks for such modules within 10 percentage points of the pass mark, the Board of Examiners may nevertheless award the credits for the module(s), subject to the requirements of the Credit Framework and provided that the student has achieved the **programme** learning outcomes. For further information refer to the Credit Framework. No modules may be trailed. |

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| **KV Code** | **Code** | **Title** | **Level** | **Credits** | **Term(s)** |
| **Stage 1** |
| **Compulsory Modules** |
|  LABS4090 | LABS409 | Organic Chemistry | 4 | 15 | (1,2) |
|  LABS4100 | LABS410 | Physical Chemistry | 4 | 15 | (1,2) |
|  LABS4110 | LABS411 | General and Inorganic Chemistry | 4 | 15 | (1,2) |
|  LABS4120 | LABS412 | Basic Analytical Chemistry | 4 | 15 | (1,2) |
| LABS4060 | LABS406 | Basic Laboratory Skills | 4 | 15 | (1,2) |
| **Stage 1 – Year Two** |
| **Compulsory Modules**  |
| LABS4130 | LABS413 | Introduction to Polymer Chemistry | 4 | 15 | (1,2) |
| LABS4020 | LABS402 | Biochemistry | 4 | 15 | (1,2) |
| LABS4070 | LABS407 | Business Improvement | 4 | 15 | (1,2) |
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| **Stage 2 – Year Two** |
| **Compulsory Modules** |
| LABS5010 | LABS501 | Advanced Laboratory Skills | 5 | 15 | (1,2) |
| LABS5020 | LABS502 | Company-Based Project\* | 5 | 45\* | 2 |
| **Optional Modules** Students must select one level 5 15 credit CHDA module |
| **Stage 2 – Year Three** |
| **Compulsory Modules – Continue to complete Company-Based Project from Year Two in Terms 1,2** |
|  |  |  |  |  |  |
| **Optional Modules** Students must select three level 5 15 credit CHDA modules to make a total of 45 credits |
| **Stage 3 – Year Four** |
| **Compulsory Modules** |
| LABS6010 | LABS601 | Research Methods | 6 | 15 | (1,2) |
| LABS6020 | LABS602 | Drug Discovery and Development | 6 | 15 | (1,2) |
| **Optional Modules** Students must select three level 6 15 credit CHDA modules to make a total of 45 credits |
|  **Stage 3 – Year Five** |
| **Compulsory Module** |
| LABS6080 | LABS608 | Laboratory Research Project | 6 | 45 | (1,2) |

\* Module will run across years 2 and 3.

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| **18 Work-Based Learning**Disability Statement: Where disabled students are due to undertake a work placement as part of this programme of study, a representative of the University will meet with the work placement provider in advance to ensure the provision of anticipatory and reasonable adjustments in line with legal requirements. |
| Where relevant to the programme of study, provide details of any work-based learning element, inclusive of employer details, delivery, assessment and support for students.  |
| The character of this programme is based on the integration of employer involvement together with flexible delivery, having work-based learning at the core of the programme. Work based activities are embedded in the e-learning materials used to deliver the knowledge in the science based modules. There is a core business improvement module together with an optional business module on a topic relevant to the business or workplace. The programme also has two significant projects, one Business-based and the other Laboratory Research project which will ideally provide business improvement(s) for the relevant company. |

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| **19 Support for Students and their Learning** |
| * School and University induction programme
* Programme/module handbooks
* Centre for Higher and Degree Apprenticeships http:/www.kent.ac.uk/apprenticeships
* Library services <http://www.kent.ac.uk/library/>
* Student Support <http://www.kent.ac.uk/studentsupport/>
* Student Wellbeing [www.kent.ac.uk/studentwellbeing/](http://www.kent.ac.uk/studentwellbeing/)
* Centre for English and World Languages <http://www.kent.ac.uk/cewl/index.html>
* Student Learning Advisory Service <http://www.kent.ac.uk/uelt/about/slas.html>
* PASS system <https://www.kent.ac.uk/teaching/qa/codes/taught/annexg.html>
* Academic Adviser system <https://www.kent.ac.uk/teaching/advisers/index.html>
* Kent Union [www.kentunion.co.uk/](http://www.kentunion.co.uk/)
* Careers and Employability Services [www.kent.ac.uk/ces/](http://www.kent.ac.uk/ces/)
* Counselling Service https://www.kent.ac.uk/studentwellbeing/counselling/
* Information Services (computing and library services) [www.kent.ac.uk/is/](http://www.kent.ac.uk/is/)
* Undergraduate student representation at School, Faculty and Institutional levels
* International Recruitment Office <https://www.kent.ac.uk/internationalstudent/>; International Partnerships Office <https://www.kent.ac.uk/global/partnerships/>
* Medical Centre <https://www.kent.ac.uk/studentwellbeing/medicalcentre.html>
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| **20 Entry Profile**The minimum age to study a degree programme at the university is normally at least 17 years old by 20 September in the year the programme begins. There is no upper age limit. |
| 20.1 **Entry Route**For current information, please refer to the University prospectus |
| Entry requirementsApprenticeships are also offered to up-skill the existing workforce, therefore if you are an applicant without the traditional qualifications listed below; and have prior learning and skills developed from your workplace, please contact the university and we will consider applicants on a case by case basis. Home/EU students The University will consider applications from students offering a wide range of qualifications. Typical requirements are listed below. Students offering alternative qualifications should contact us for further advice. It is not possible to offer places to all students who meet this typical offer/minimum requirement.A level 80 points including DD at GCE A2 level for Chemistry and another science subject.Vocational Science based A level (Double award 12 units) and a pass in an approved English Language qualification GCSE Five GCSE passes, including English Language or Use of English and Mathematics at grade C or above (9- 4), and at least two subjects at A2 level. Access to HE Diploma A satisfactory pass in an approved Science Based Foundation or Access programme. Please check with the University beforehand that we will accept the Access/Foundation syllabus you took.  BTEC Level 3 Extended Diploma (formerly BTEC National Diploma) BTEC National Certificate in Science (merit level) and a pass in an approved English language qualification BTEC National Diploma in Science (merit level) and a pass in an approved English language qualification. International Baccalaureate 26/30 points (12/14 at Higher). The course studied must contain a significant content of Science at the required level. Please check with the University beforehand that you have studied sufficient Science at the required level. |
| 20.2 **What does this programme have to offer?** |
| * A thorough understanding of the fundamental principles of the scientific discipline of chemistry and how these fundamental principles can be applied to the understanding real-world situations in the chemical industry.
* A thorough understanding of how the scientific discipline of chemistry is integral modern-day medicines, materials and other products.
* A detailed understanding of the variety of technical approaches and research strategies which underpin chemical research.
* The opportunity apply knowledge directly to the workplace.
* A route to employment in the chemical/pharmaceutical industry and MSc/PhD study.
* Teaching by research active experts in the pillars of chemistry and in related scientific disciplines, such as materials, pharmaceuticals and biochemistry
 |
| 20.3 **Personal Profile** |
| * You should have good aptitude and enthusiasm for science and scientific discovery.
* You should be numerate and confident with mathematics.
* You should have a willingness to develop the practical and intellectual skills needed to gain a full appreciation of the scientific discipline of chemistry.
* You should wish to obtain advanced scientific/laboratory training relevant to the scientific discipline of chemistry or related scientific disciplines.
* You should wish to make opportunities to relate your learning to activities in your workplace.
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| 21 **Methods for Evaluating and Enhancing the Quality and Standards of Teaching and Learning** |
| 21.1 **Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards** |
| * Student module evaluations
* Annual programme and module monitoring reports <http://www.kent.ac.uk/teaching/qa/codes/taught/annexe.html>
* External Examiners system <http://www.kent.ac.uk/teaching/qa/codes/taught/annexk.html>
* Periodic programme review <http://www.kent.ac.uk/teaching/qa/codes/taught/annexf.html>
* Annual staff appraisal
* Peer observation
* Quality Assurance Framework <http://www.kent.ac.uk/teaching/qa/codes/index.html>
* QAA Higher Education Review <http://www.qaa.ac.uk/InstitutionReports/types-of-review/higher-education-review/Pages/default.aspx>
* External accreditation by Royal Society of Chemistry
 |
| 21.2 **Committees with responsibility for monitoring and evaluating quality and standards** |
| * Staff-Student Liaison Committee
* School Education Committee
* Faculty Education Committee
* Faculty Board
* Education Board
* Board of Examiners
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| 21.3 **Mechanisms for gaining student feedback on the quality of teaching and their learning experience** |
| * Student module evaluations
* Staff-Student Liaison Committee
* Student rep system (School, Faculty and Institutional level)
* NSS
* Employer feedback
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| 21.4 **Staff Development priorities include:** |
| * PGCHE requirements
* HEA (associate) fellowship membership
* Annual appraisals
* Institutional Level Staff Development Programme
* Academic Practice Provision (PGCHE, other development opportunities)
* Professional body membership and requirements
* Programme team meetings
* Research seminars
* Conferences
* Study leave
* Equality, Diversity and Inclusivity (EDI) awareness
* Attendance at employer/industry conferences.
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| 22 **Indicators of Quality and Standards** |
| * Results of periodic programme review when due
* QAA Higher Education Review 2015
* Annual External Examiner reports
* Annual programme and module monitoring reports
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| 22.1 **The following reference points were used in creating these specifications:** |
| * QAA UK Quality Code for Higher Education <http://www.qaa.ac.uk/assuring-standards-and-quality>
* QAA Benchmarking statement for Chemistry 2014
* School and Faculty plan
* University Plan <https://www.kent.ac.uk/about/plan/> and Learning and Teaching Strategies https://www.kent.ac.uk/uelt/strategies/lta.html
* Staff research activities
* Kent Inclusive Practices (<https://www.kent.ac.uk/studentsupport/accessibility/inclusive-practice.html>)
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| 23 **Inclusive Programme Design**  |
| The School recognises and has embedded the expectations of current equality legislation, by ensuring that the programme 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. |

*Template last updated November 2017*

**BSc Applied Chemical Sciences for Laboratory Scientists**

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|  |  | **Stage 1** | **Stage 2** | **Stage 3** |
|  | Organic Chemistry | Physical Chemistry | General and Inorganic Chemistry | Basic Analytical Chemistry | Basic Laboratory Skills | Introduction to Polymer Chemistry | Biochemistry |  | Business Improvement | Advanced Laboratory Skills |  |  |  |  |  |  |  | Company Based Project | Research Methods | Drug Discovery |  |  |  |  |  | Laboratory Research Project |
|  | **Knowledge and Understanding** |
| A1 | X | X | X | X |  | X | X |  | X |  |  |  |  |  |  |  |  | X |  | X |  |  |  |  |  |  |
| A2 | X | X | X | X |  | X | X |  | X |  |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  |  |
| A3 | X | X | X | X | X | X | X |  | X |  |  |  |  |  |  |  |  | X |  | X |  |  |  |  |  | X |
| A4 |  | X | X | X | X | X |  |  | X |  |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| A5 |  |  | X | X | X |  | X |  | X |  |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| A6 |  |  |  |  |  | X | X |  | X |  |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  |  |
| A7 | X |  |  |  | X | X | X |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| A8 | X |  |  |  |  | X |  |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  |  |
| A9 |  |  |  |  | X |  | X |  | X | X |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  | X |
| A10 | X | X | X | X |  |  |  |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| A11 | X | X | X | X |  | X | X |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| A12 |  | X |  | X | X |  |  |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
|  | **Intellectual Skills** |
| B1 | X | X | X | X | X | X | X |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  |  |
| B2 | X | X | X | X | X | X | X |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| B3 | X | X | X | X | X | X | X |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| B4 |  |  | X | X | X |  |  |  | X |  |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| B5 |  |  | X | X |  |  |  |  | X |  |  |  |  |  |  |  |  | X | X |  |  |  |  |  |  | X |
| B6 |  |  | X | X |  |  |  |  | X |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  | X |
| B7 |  |  | X | X |  |  |  |  | X |  |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
|  | **Subject-Specific Skills**  |
| C1 | X | X | X | X | X | X | X |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| C2 | X | X | X | X | X | X | X |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| C3 | X | X | X | X | X | X | X |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| C4 |  |  |  |  |  | X | X |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  | X |
| C5 | X | X | X | X | X | X | X |  | X | X |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  | X |
|  | **Transferable Skills**  |
| D1 | X | X | X | X | X | X | X |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| D2 | X | X | X | X |  | X | X |  |  | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| D3 | X | X | X | X |  | X | X |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| D4 | X | X | X | X | X | X | X |  | X | X |  |  |  |  |  |  |  | X | X |  |  |  |  |  |  | X |
| D5 |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  | X | X |  |  |  |  |  |  | X |
| D6 |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  | X |
| D7 | X | X | X | X | X | X | X |  | X | X |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |
| D8 | X | X | X | X | X | X | X |  | X | X |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  | X |
| D9 | X | X | X | X | X | X | X |  | X | X |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  | X |