# Programme Specification (Undergraduate) FOR ENTRY YEAR: 2021/22

**Date created:** Click or tap here to enter text. **Last amended:** 07/04/2021 **Version no.** Choose an item.

## 1. Programme title(s) and code(s):

BSc Chemistry

### a) HECOS Code

| HECOS Code | % |
|---|---|
| | |
| | |
| | |
| | |

### b) UCAS Code (where required)

BSc Chemistry F100

## 2. Awarding body or institution:

University of Leicester

## 3. a) Mode of study

Full-time

### b) Type of study

Campus-based based in Panjin campus, DUT, PRC

## 4. Registration periods:

BSc Chemistry

The normal period of registration is four years.
The maximum period of registration is six years.

## 5. Typical entry requirements

All students that have followed the Chinese school and qualification system must be from the same Gaokao group (the top group out of four) as students entering other DUT undergraduate programmes. Students must also possess a sufficient level of English language to enable such students to undertake studies with the English language as the teaching medium. For Year 1 entry, a Gaokao English language score of 70% for English language or an IELTS score of 5.0 will be required. After intensive English language teaching in Year 1, students will be required to demonstrate CEFR Level B2 in English language (otherwise IELTS 6.0).

## 6. Accreditation of Prior Learning

APL will not be accepted for exemptions from individual modules, however may be considered f or direct entry to year 2, on a case by case and
subject to the general provisions of the University APL policy.

## 7. Programme aims

The programme aims to provide a broad and in-depth understanding of ideas central to chemistry

- To provide students with direct experience of a UK-style degree programme
- To enhance and develop the students' English language skills
- To train students in the practical skills necessary for the safe manipulation of chemicals
- To generate interest in, and understanding of, the wider role of chemistry in society e.g. industry and commerce
- To enable students to develop independent learning skills as well as the experience of working as part of a team
- To stimulate intellectual development, develop powers of critical analysis and ability to solve problems
- To enhance written and oral communication skills
- To provide students with training in mathematical techniques and IT skills
- To introduce students to chemical research methodology through carrying out a research pro ject
- To introduce students to some topics of current chemical or chemical engineering research
- To equip students with the knowledge and generic skills for employment or further training in R&D, science-based industry and establishments, education, and for training at management levels in other professions.

## 8. Reference points used to inform the programme specification

QAA Frameworks for Higher Education Qualifications in England Wales and Northern Ireland

- QAA Benchmark Statement for Chemistry 2014
- QAA subject review
- PDR report (May 2011)
- University Learning Strategy
- University Employability Strategy
- NSS 2014
- First destination survey
- External examiners reports
- RSC accreditation [ http://www.rsc.org/Education/courses-and-careers/accredited- courses/index.asp ],

## 9. Programme Outcomes

Unless otherwise stated, programme outcomes apply to all awards specified in 1. Programme title(s).

### a) Discipline specific knowledge and competencies

i) Mastery of an appropriate body of knowledge

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should be able to: recall and apply basic chemistry theory across all three main areas of chemistry (organic, inorganic and physical) and related mathematics; solve structured and unseen model problems; conduct experiments and apply practical techniques. | Lectures; Directed reading; Problem classes; Tutorials; Laboratory Practical Classes; Computer aided training. | Written exams; assessed practical work; assessed computer exercises; assessed problems; tutorial work |

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should have detailed knowledge of selected topics in five areas of chemistry (analytical, chemical engineering, organic, inorganic and physical). | Lectures; Directed reading; Problem classes; Computer aided training; Project supervision | Written exams; assessed computer exercises; project assessment. |

ii) Understanding and application of key concepts and techniques

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should be able to: apply chemical concepts in new situations e.g. ability to predict physical and chemical properties by comparison with analogues; apply logic and chemical knowledge to make deductions based on (limited) evidence; solve familiar and unfamiliar chemistry related problems; design, construct and undertake experiments; demonstrate professional use of standard equipment and knowledge of and application of safety procedures. | Lectures; Directed Reading; Problem Classes; Tutorials; Laboratory Practical Classes; Computer aided learning; Project supervision. | Written exams; assessed practical work, including lab samples, associated data, lab notebooks and reports; assessed computer exercises; assessed problems; tutorial work; project assessment. |

iii) Critical analysis of key issues

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should be able to: critically appraise physical and chemical information, and discuss its limitations; summarise key findings of scientific papers; draw quantitative conclusions from sample data; critically assess and compare scientific theories | Progressively through the programme, particularly in the 4th year. Lectures; Problem Classes; Tutorials; Laboratory Practical Classes; Group projects; Computer aided learning; Project supervision. | Written exams; assessed practical work, including lab samples, associated data, lab notebooks and reports; assessed computer exercises; assessed problems; tutorial work; project assessment. |

iv) Clear and concise presentation of material

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should be able to: present scientific ideas, data and results in a variety of (appropriate) forms, e.g. reports, seminars, posters; use chemical software, e.g. drawing, molecular modelling; participate in scientific discussion and debate. | Tutorials, Laboratory Practical Classes; Group projects; Problem classes; Project supervision. | Assessed practical work, including lab samples, associated data, lab notebooks and reports; assessed computer exercises; assessed problems; tutorial work; project assessment. |

v) Critical appraisal of evidence with appropriate insight

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should be able to: discuss and implement experimental methodology; collect and critically analyse data; draw valid inferences from data; interrogate and discuss scientific literature. | Tutorials, Laboratory Practical Classes; Group projects; Problem classes; Project supervision. | Assessed practical work, including lab samples, associated data, lab notebooks and reports; assessed computer exercises; assessed problems; tutorial work; project assessment. |

vi) Other discipline specific competencies

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should be able to: respond to questioning; give a short seminar. | Tutorials: Group project supervision; Project supervision | Tutorial work; project assessment. |

**b) Transferable skills**

i) Oral communication

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| In English, typical students should be able to: give reasoned arguments in response to chemical questions; give a short seminar on a chemical topic | Tutorials; Group work; Group project supervision; Project supervision | Tutorial work; Oral project presentations and examinations |

ii) Written communication

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| In English, typical students should be able to: write abstracts, tutorial and problem class work, lab notebooks, lab reports and project dissertation; communicate scientifically. | Lectures; Tutorials; Practical classes; Group work; Writing workshops; Project supervision. | Assessed practical work, including lab samples, associated data, lab notebooks and reports; assessed computer exercises; assessed problems; assessed essays; tutorial work; project assessment. |

iii) Information technology

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should be able to: use mathematical packages for data analysis; use spreadsheets, presentation and word processing facilities; use scientific software packages, e.g. drawing or molecular modelling. | Problem classes; Practical classes;<br>Group work; Project supervision | Assessed practical work; assessed computer exercises; project assessment. |

iv) Numeracy

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should be able to: use analytical and graphical methods; use calculus in Chemistry and Chemical Engineering; analyse data; solve numerical problems. | Progressively throughout course. | Written exams; assessed practical work, including lab samples, associated data, lab notebooks and reports; assessed computer exercises; assessed problems; tutorial work; project assessment. |

v) Team working

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should be able to: discuss concepts and formulate plans working with peers; organize time and tasks; produce joint reports/presentations; recognize individual strengths. | Group problem solving; Group projects; Project supervision | Group assessments (oral and written); project assessment. |

vi) Problem solving

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should be able to: apply knowledge; analyse and solve familiar and unfamiliar problems; plan and implement laboratory work and projects. | Lectures; Problem Classes; Tutorials; Laboratory Practical Classes; Computer aided learning; Project supervision. | Written exams; assessed practical work; assessed computer exercises; assessed problems; tutorial work; project assessment. |

vii) Information handling

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should be able to: describe and discuss the scientific method; gather, retrieve, manipulate and analyse chemical data and information from a variety of sources including scientific journals and databases; present data in appropriate forms. | Lectures; Problem Classes; Tutorials; Laboratory Practical Classes; Computer aided learning; Project supervision. | Written exams; assessed practical work; assessed computer exercises; assessed problems; tutorial work; project assessment. |

viii) Skills for lifelong learning

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Typical students should be able to: demonstrate understanding of the professional responsibilities of a chemist; develop their study and time management skills; learn independently; access and search scholarly articles and databases; retrieve information; analyse data; work in groups; plan and implement group and individual activities. | Progressively through the programme, particularly in the 4$^{th}$ year.<br>Lectures; Problem Classes; Tutorials; Laboratory Practical Classes; Group projects; Computer aided learning; Project supervision. | Meeting deadlines; All assessment elements; Project assessment. |

## 10. Progression points

This programme follows the standard Scheme of Progression set out in Senate Regulations – see the version of Senate Regulation 5 governing undergraduate programmes relevant to the year of entry.

Additional progression criteria include:-

- Students must pass the English language modules in year 1, which cannot be carried into year 2.
- Students must pass each of the chemistry laboratory practical modules in years 2 and 3, for which there are no opportunities for reassessment, and which cannot be carried into the subsequent year. These modules have an additional attendance requirement wherein students may not be absent for more than 25% of the schedule laboratory classes. Additional "catch-up" sessions will be provided for students for whom non-attendance has been mitigated.

In cases where a student has failed to meet a requirement to progress he or she will be required to withdraw from the course.

Transfer between different degrees: Students not satisfying the UoL progression requirements may be allowed to transfer onto DUT programmes. Students satisfying the UoL progression requirements may be allowed to transfer to the University of Leicester campus-based BSc Chemistry degree programme, subject to capacity and physical resource limitations on the UoL campus.

### c) Course transfers

n/a

## 11. Criteria for award and classification

This programme follows the standard scheme of undergraduate award and classification set out in Senate Regulations – see the version of *Senate Regulation 5 governing undergraduate programmes* relevant to the year of entry.

## 12. Special features

Programme delivered entirely in English with UK-style facilities provided on Panjin campus, Small group tutorials via simultaneous on-line classroom approaches, group problem solving, research-based projects, problem based learning.

## 13. Indications of programme quality

All current BSc degrees were accredited by the Royal Society of Chemistry (RSC) in Jan 2016. It is our intention to seek accreditation from the RSC for this BSc Chemistry programme during the next accreditation review.

## 14. External Examiner(s) reports

The details of the External Examiner(s) for this programme and the most recent External Examiners' reports for this programme can be found at exampapers@Leicester [log-in required]

UNIVERSITY OF LEICESTER

# Programme Specification (Undergraduate) FOR ENTRY YEAR: 2021/22

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## Appendix 1: Programme structure (programme regulations)

The University regularly reviews its programmes and modules to ensure that they reflect the current status of the discipline and offer the best learning experience to students. On occasion, it may be necessary to alter particular aspects of a course or module.

BSc Chemistry

**Level 7/Year 1 2021/22**

Credit breakdown

| Status | Year long | Semester 1 | Semester 2 |
|---|---|---|---|
| Core | n/a | 60 credits | 60 credits |
| Optional | n/a | n/a | n/a |

120 credits in total

Core modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | EL0002 | ENGLISH FOR GENERAL ACADEMIC PURPOSE | 45 credits |
| Sem 1 | CH0280 | ADVANCED MATHEMATICS I | 15 credits |
| Sem 1 | | MILITARY THEORY AND TRAINING | n/a |
| Sem 1 | | MORAL CULTIVATION AND BASIC LAW | n/a |
| Sem 1 | | PHYSICAL EDUCATION I | n/a |
| Sem 2 | EL0005 | ENGLISH FOR SPECIFIC ACADEMIC PURPOSES | 15 credits |
| Sem 2 | CH0061 | INTRODUCTION TO CHEMISTRY | 30 credits |

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 2 | CH0281 | ADVANCED MATHEMATICS II | 15 credits |
| Sem 2 | | CHINESE MODERN CONTEMPORARY HISTORY AND SITUATION POLICY | n/a |
| Sem 2 | | PHYSICAL EDUCATION II | n/a |
| Sem 3 | | COLLEGE STUDENT MENTAL HEALTH AND HEALTH EDUCATION | n/a |

**Level 7/Year 2 2022/23**

Credit breakdown

| Status | Year long | Semester 1 | Semester 2 |
|---|---|---|---|
| Core | 15 credits | 60 credits | 45 credits |
| Optional | n/a | n/a | n/a |

120 credits in total

Core modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Year long | CH1205 | INTRODUCTORY CHEMISTRY PRACTICAL B | 15 credits |
| Sem 1 | CH1200 | GENERAL CHEMISTRY | 15 credits |
| Sem 1 | CH1202 | INTRODUCTORY INORGANIC CHEMISTRY | 15 credits |
| Sem 1 | CH1283 | COLLEGE PHYSICS AND PRACTICAL A | 15 credits |
| Sem 1 | CH1282 | ADVANCED MATHEMATICS III | 15 credits |
| Sem 1 | | COLLEGE COMPUTING | n/a |
| Sem 1 | | PRINCIPLE OF MARXISM AND THEORY OF SOCIALISM | n/a |
| Sem 2 | CH1201 | INTRODUCTORY ORGANIC CHEMISTRY | 15 credits |

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 2 | CH1203 | INTRODUCTORY PHYSICAL CHEMISTRY | 15 credits |
| Sem 2 | CH1284 | COLLEGE PHYSICS AND PRACTICAL B | 15 credits |
| Sem 2 | | INTRODUCTION TO MAOISM AND THEORY OF SOCIALISM | n/a |
| Sem 2 | | GENERAL OPTIONAL COURSE 1 | n/a |
| Sem 3 | | COGNITION PRACTICAL | n/a |

**Notes**

*CH1205 split approximately 5 credits Sem 1, 10 credits Sem 2*

**Level 7/Year 3 2023/24**

Credit breakdown

| Status | Year long | Semester 1 | Semester 2 |
|---|---|---|---|
| Core | n/a | 60 credits | 60 credits |
| Optional | n/a | n/a | n/a |

120 credits in total

Core modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH2200 | SPECTROSCOPY THEORY AND PRACTICE | 15 credits |
| Sem 1 | CH2201 | ORGANIC CHEMISTRY | 15 credits |
| Sem 1 | CH2280 | PRINCIPLES OF CHEMICAL ENGINEERING AND PRACTICAL I | 15 credits |
| Sem 1 | CH2284 | PRACTICAL CHEMISTRY AND KEY SKILLS PART A | 15 credits |
| | | BIOCHEMISTRY | N/a |
| | | BIOCHEMISTRY PRACTICAL | N/a |
| Sem 2 | CH2202 | INORGANIC CHEMISTRY | 15 credits |
| Sem 2 | CH2203 | PHYSICAL CHEMISTRY | 15 credits |
| Sem 2 | CH2281 | PRINCIPLES OF CHEMICAL ENGINEERING AND PRACTICAL II | 15 credits |
| Sem 2 | CH2285 | PRACTICAL CHEMISTRY AND KEY SKILLS PART B | 15 credits |
| Sem 2 | | GENERAL OPTIONAL COURSE 2 | N/a |
| Sem 3 | | PRODUCTION PRACTICAL | N/a |

**Notes**
n/a

## Level 7/Year 4 2024/25

**YEAR 4**

Credit breakdown

| Status | Year long | Semester 1 | Semester 2 |
|---|---|---|---|
| Core | n/a | 45 credits | 60 credits |
| Optional | Choose an item. | 15 credits | n/a |

120 credits in total

Core modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH3201 | ADVANCED ORGANIC CHEMISTRY | 15 credits |
| Sem 1 | CH3202 | ADVANCED INORGANIC CHEMISTRY | 15 credits |
| Sem 1 | CH3203 | ADVANCED PHYSICAL CHEMISTRY | 15 credits |
| Sem 1 | | GENERAL OPTIONAL COURSE 3 | 15 credits |
| Sem 2 | CH3205 | METALS IN SYNTHESIS | 15 credits |
| Sem 2 | CH3851 | FINAL YEAR PROJECT PART I | 30 credits |
| Sem 2 | CH3852 | FINAL YEAR PROJECT PART II | 15 credits |

**Notes**
*Year Long modules sequenced to result in approximately equal workload across Semester 1 and 2*

Option modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH3206 | ADVANCED ANALYTICAL CHEMISTRY | 15 credits |
| Sem 1 | CH3280 | POLYMER CHEMISTRY AND PHYSICS | 15 credits |

**Notes**

Chose one from the 2 choices listed above.

This is an indicative list of option modules and not definitive of what will be available. Option module choice is also subject to availability, timetabling, student number restrictions and, where appropriate, students having taken appropriate pre-requisite modules.

## Level 7/Year 1 2021/22

**(2+2 students are at DUT (Panjin))**

Credit breakdown

| Status | Year long | Semester 1 | Semester 2 |
|---|---|---|---|
| Core | n/a | 60 credits | 60 credits |
| Optional | n/a | n/a | n/a |

120 credits in total

Core modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | EL0002 | ENGLISH FOR GENERAL ACADEMIC PURPOSE | 45 credits |

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH0280 | ADVANCED MATHEMATICS I | 15 credits |
| Sem 1 | | MILITARY THEORY AND TRAINING | |
| Sem 1 | | MORAL CULTIVATION AND BASIC LAW | |
| Sem 1 | | PHYSICAL EDUCATION I | |
| Sem 2 | EL0005 | ENGLISH FOR SPECIFIC ACADEMIC PURPOSES | 15 credits |
| Sem 2 | CH0061 | INTRODUCTION TO CHEMISTRY | 30 credits |
| Sem 2 | CH0281 | ADVANCED MATHEMATICS II | 15 credits |
| Sem 2 | | CHINESE MODERN CONTEMPORARY HISTORY AND SITUATION POLICY | |
| Sem 2 | | PHYSICAL EDUCATION II | |
| Sem 3 | | COLLEGE STUDENT MENTAL HEALTH AND HEALTH EDUCATION | |

**Notes**
*n/a*

**Level 7/Year 2 2022/23**

**(2+2 students are at DUT (Panjin))**

Credit breakdown

| **Status** | **Year long** | **Semester 1** | **Semester 2** |
|---|---|---|---|
| Core | 15 credits | 60 credits | 45 credits |
| Optional | n/a | n/a | n/a |

120 credits in total

Core modules

| **Delivery period** | **Code** | **Title** | **Credits** |
|---|---|---|---|
| Sem 1 | CH1200 | GENERAL CHEMISTRY | 15 credits |
| Sem 1 | CH1202 | INTRODUCTORY INORGANIC CHEMISTRY | 15 credits |
| Sem 1 | CH1283 | COLLEGE PHYSICS AND PRACTICAL A | 15 credits |
| Sem 1 | CH1282 | ADVANCED MATHEMATICS III | 15 credits |
| Sem 1 | | COLLEGE COMPUTING | n/a |
| Sem 1 | | PRINCIPLE OF MARXISM AND THEORY OF SOCIALISM | n/a |
| Sem 2 | CH1201 | INTRODUCTORY ORGANIC CHEMISTRY | 15 credits |
| Sem 2 | CH1203 | INTRODUCTORY PHYSICAL CHEMISTRY | 15 credits |
| Sem 2 | CH1284 | COLLEGE PHYSICS AND PRACTICAL B | 15 credits |
| Sem 2 | | INTRODUCTION TO MAOISM AND THEORY OF SOCIALISM | n/a |

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 2 | | GENERAL OPTIONAL COURSE 1 | n/a |
| Sem 3 | | COGNITION PRACTICAL | n/a |
| Year Long | CH1205 | INTRODUCTORY CHEMISTRY PRACTICAL B | 15 credits |

**Notes**
*CH1205 split approximately 5 credits Sem 1, 10 credits Sem 2*

## Level 7/Year 3 2023/24

**(2+2 students are at the University of Leicester)**

Credit breakdown

| Status | Year long | Semester 1 | Semester 2 |
|---|---|---|---|
| Core | 75 credits | 30 credits | 15 credits |
| Optional | Choose an item. | Choose an item. | n/a |

120 credits in total

Core modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH2200 | SPECTROSCOPY THEORY AND PRACTICE | 15 credits |
| Sem 1 | CH2207 | POLYMER AND MATERIALS CHEMISTRY | 15 credits |
| Sem 2 | CH2206 | ANALYTICAL CHEMISTRY IN PRACTICE | 15 credits |
| Sem 2 | CH1209 | INTRODUCTORY PHARMACEUTICAL CHEMISTRY | n/a |

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 3 | | PRODUCTION PRACTICAL | n/a |
| Year Long | CH2201 | ORGANIC CHEMISTRY | 15 credits |
| Year Long | CH2202 | INORGANIC CHEMISTRY | 15 credits |
| Year Long | CH2203 | PHYSICAL CHEMISTRY | 15 credits |
| Year Long | CH2204 | PRACTICAL CHEMISTRY AND KEY SKILLS | 30 credits |

**Notes**
*Year Long modules sequenced to result in approximately equal workload across Semester 1 and 2*

## Level 7/Year 4 2024/25

**(2+2 students are at University of Leicester)**

Credit breakdown

| Status | Year long | Semester 1 | Semester 2 |
|---|---|---|---|
| Core | 30 credits | 45 credits | 30 credits |
| Optional | n/a | n/a | 15 credits |

120 credits in total

Core modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH3201 | ADVANCED ORGANIC CHEMISTRY | 15 credits |
| Sem 1 | CH3202 | ADVANCED INORGANIC CHEMISTRY | 15 credits |

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH3261 | BSC PROJECT PRACTICAL | 15 credits |
| Sem 2 | CH3203 | ADVANCED PHYSICAL CHEMISTRY | 15 credits |
| Sem 2 | CH3205 | METALS IN SYNTHESIS | 15 credits |
| Year Long | CH3260 | BSc GENERAL PAPER & KEY SKILLS | 15 credits |
| Year Long | CH3262 | BSC PROJECT REPORT | 15 credits |

**Notes**

*n/a*

Option modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH3206 | ADVANCED ANALYTICAL CHEMISTRY | 15 credits |
| Sem 1 | CH3208 | ADVANCED MATERIALS CHEMISTRY | 15 credits |

**Notes**

Chose one from the 2 choices listed above.

This is an indicative list of option modules and not definitive of what will be available. Option module choice is also subject to availability, timetabling, student number restrictions and, where appropriate, students having taken appropriate pre-requisite modules.

**Level 7/Year 1 2021/22**

**(2+1+1 students are at DUT (Panjin))**

Credit breakdown

| **Status** | **Year long** | **Semester 1** | **Semester 2** |
|---|---|---|---|
| Core | n/a | 60 credits | 60 credits |
| Optional | n/a | n/a | n/a |

120 credits in total

Core modules

| **Delivery period** | **Code** | **Title** | **Credits** |
|---|---|---|---|
| Sem 1 | EL0002 | ENGLISH FOR GENERAL ACADEMIC PURPOSE | 45 credits |
| Sem 1 | CH0280 | ADVANCED MATHEMATICS I | 15 credits |
| Sem 1 | | MILITARY THEORY AND TRAINING | |
| Sem 1 | | MORAL CULTIVATION AND BASIC LAW | |
| Sem 1 | | PHYSICAL EDUCATION I | |
| Sem 2 | EL0005 | ENGLISH FOR SPECIFIC ACADEMIC PURPOSES | 15 credits |
| Sem 2 | CH0061 | INTRODUCTION TO CHEMISTRY | 30 credits |
| Sem 2 | CH0281 | ADVANCED MATHEMATICS II | 15 credits |
| Sem 2 | | CHINESE MODERN CONTEMPORARY HISTORY AND SITUATION POLICY | |
| Sem 2 | | PHYSICAL EDUCATION II | |
| Sem 3 | | COLLEGE STUDENT MENTAL HEALTH AND HEALTH EDUCATION | |

**Notes**
*CH1205 split approximately 5 credits Sem 1, 10 credits Sem 2*

## Level 7/Year 2 2022/23

**(2+1+1 students are at DUT (Panjin))**

Credit breakdown

| Status | Year long | Semester 1 | Semester 2 |
|---|---|---|---|
| Core | 15 credits | 60 credits | 45 credits |
| Optional | n/a | n/a | n/a |

120 credits in total

Core modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH1200 | GENERAL CHEMISTRY | 15 credits |
| Sem 1 | CH1202 | INTRODUCTORY INORGANIC CHEMISTRY | 15 credits |
| Sem 1 | CH1283 | COLLEGE PHYSICS AND PRACTICAL A | 15 credits |
| Sem 1 | CH1282 | ADVANCED MATHEMATICS III | 15 credits |
| Sem 1 | | COLLEGE COMPUTING | 15 credits |
| Sem 1 | | PRINCIPLE OF MARXISM AND THEORY OF SOCIALISM | 15 credits |
| Sem 2 | CH1201 | INTRODUCTORY ORGANIC CHEMISTRY | 15 credits |
| Sem 2 | CH1203 | INTRODUCTORY PHYSICAL CHEMISTRY | 15 credits |
| Sem 2 | CH1284 | COLLEGE PHYSICS AND PRACTICAL B | 15 credits |
| Sem 2 | | INTRODUCTION TO MAOISM AND THEORY OF SOCIALISM | 15 credits |

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 2 | | GENERAL OPTIONAL COURSE 1 | 15 credits |
| Sem 3 | | COGNITION PRACTICAL | 15 credits |
| Year Long | CH1205 | INTRODUCTORY CHEMISTRY PRACTICAL B | 15 credits |

**Notes**
*CH1205 split approximately 5 credits Sem 1, 10 credits Sem 2*

## Level 7/Year 3 2023/24

**(2+1+1 students are at the University of Leicester)**

Credit breakdown

| Status | Year long | Semester 1 | Semester 2 |
|---|---|---|---|
| Core | 75 credits | 30 credits | 15 credits |
| Optional | Choose an item. | Choose an item. | n/a |

120 credits in total

Core modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH2200 | SPECTROSCOPY THEORY AND PRACTICE | 15 credits |
| Sem 1 | CH2207 | POLYMER AND MATERIALS CHEMISTRY | 15 credits |
| Sem 2 | CH2206 | ANALYTICAL CHEMISTRY IN PRACTICE | 15 credits |
| Sem 2 | CH1209 | INTRODUCTORY PHARMACEUTICAL CHEMISTRY | n/a |

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 3 | | PRODUCTION PRACTICAL | n/a |
| Year Long | CH2201 | ORGANIC CHEMISTRY | 15 credits |
| Year Long | CH2202 | INORGANIC CHEMISTRY | 15 credits |
| Year Long | CH2203 | PHYSICAL CHEMISTRY | 15 credits |
| Year Long | CH2204 | PRACTICAL CHEMISTRY AND KEY SKILLS | 30 credits |

**Notes**
*Year Long modules sequenced to result in approximately equal workload across Semester 1 and 2*

## Level 7/Year 4 2024/25

**(2+1+1 students are at DUT (Panjin))**

Credit breakdown

| Status | Year long | Semester 1 | Semester 2 |
|---|---|---|---|
| Core | n/a | 45 credits | 60 credits |
| Optional | n/a | 15 credits | n/a |

120 credits in total

Core modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH3201 | ADVANCED ORGANIC CHEMISTRY | 15 credits |
| Sem 1 | CH3202 | ADVANCED INORGANIC CHEMISTRY | 15 credits |

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH3203 | ADVANCED PHYSICAL CHEMISTRY | 15 credits |
| Sem 1 | | GENERAL OPTIONAL COURSE 3 | n/a |
| Sem 2 | CH3205 | METALS IN SYNTHESIS | 15 credits |
| Sem 2 | CH3851 | FINAL YEAR PROJECT PART I | 30 credits |
| Sem 2 | CH3852 | FINAL YEAR PROJECT PART II | 15 credits |

**Notes**
*n/a*

Option modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH3206 | ADVANCED ANALYTICAL CHEMISTRY | 15 credits |
| Sem 1 | CH3280 | POLYMER CHEMISTRY AND PHYSICS | 15 credits |

**Notes**
Chose one from the 2 choices listed above.

This is an indicative list of option modules and not definitive of what will be available. Option module choice is also subject to availability, timetabling, student number restrictions and, where appropriate, students having taken appropriate pre-requisite modules.

**Level 7/Year 1 2021/22**

**(3+1 students are at DUT (Panjin))**

Credit breakdown

| **Status** | **Year long** | **Semester 1** | **Semester 2** |
|---|---|---|---|
| Core | n/a | 60 credits | 60 credits |
| Optional | n/a | n/a | n/a |

120 credits in total

Core modules

| **Delivery period** | **Code** | **Title** | **Credits** |
|---|---|---|---|
| Sem 1 | EL0002 | ENGLISH FOR GENERAL ACADEMIC PURPOSE | 45 credits |
| Sem 1 | CH0280 | ADVANCED MATHEMATICS I | 15 credits |
| Sem 1 | | MILITARY THEORY AND TRAINING | n/a |
| Sem 1 | | MORAL CULTIVATION AND BASIC LAW | n/a |
| Sem 1 | | PHYSICAL EDUCATION I | n/a |
| Sem 2 | EL0005 | ENGLISH FOR SPECIFIC ACADEMIC PURPOSES | 15 credits |
| Sem 2 | CH0061 | INTRODUCTION TO CHEMISTRY | 30 credits |
| Sem 2 | CH0281 | ADVANCED MATHEMATICS II | 15 credits |
| Sem 2 | | CHINESE MODERN CONTEMPORARY HISTORY AND SITUATION POLICY | n/a |
| Sem 2 | | PHYSICAL EDUCATION II | n/a |
| Sem 3 | | COLLEGE STUDENT MENTAL HEALTH AND HEALTH EDUCATION | n/a |

**Notes**
*n/a*

**Level 7/Year 2 2022/23**

**(3+1 students are at DUT (Panjin))**

Credit breakdown

| **Status** | **Year long** | **Semester 1** | **Semester 2** |
|---|---|---|---|
| Core | 15 credits | 60 credits | 45 credits |
| Optional | n/a | n/a | n/a |

120 credits in total

Core modules

| **Delivery period** | **Code** | **Title** | **Credits** |
|---|---|---|---|
| Sem 1 | CH1200 | GENERAL CHEMISTRY | 15 credits |
| Sem 1 | CH1202 | INTRODUCTORY INORGANIC CHEMISTRY | 15 credits |
| Sem 1 | CH1283 | COLLEGE PHYSICS AND PRACTICAL A | 15 credits |
| Sem 1 | CH1282 | ADVANCED MATHEMATICS III | 15 credits |
| Sem 1 | | COLLEGE COMPUTING | n/a |
| Sem 1 | | PRINCIPLE OF MARXISM AND THEORY OF SOCIALISM | 15 credits |
| Sem 2 | CH1201 | INTRODUCTORY ORGANIC CHEMISTRY | 15 credits |
| Sem 2 | CH1203 | INTRODUCTORY PHYSICAL CHEMISTRY | 15 credits |
| Sem 2 | CH1284 | COLLEGE PHYSICS AND PRACTICAL B | n/a |
| Sem 2 | | INTRODUCTION TO MAOISM AND THEORY OF SOCIALISM | n/a |

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 2 | | GENERAL OPTIONAL COURSE 1 | n/a |
| Sem 3 | | COGNITION PRACTICAL | n/a |
| Year Long | CH1205 | INTRODUCTORY CHEMISTRY PRACTICAL B | 15 credits |

**Notes**
*CH1205 split approximately 5 credits Sem 1, 10 credits Sem 2*

### Level 7/Year 3 2023/24

**(3+1 students are at DUT (Panjin))**

Credit breakdown

| Status | Year long | Semester 1 | Semester 2 |
|---|---|---|---|
| Core | n/a | 60 credits | 60 credits |
| Optional | n/a | n/a | n/a |

120 credits in total

Core modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH2200 | SPECTROSCOPY THEORY AND PRACTICE | 15 credits |
| Sem 1 | CH2201 | ORGANIC CHEMISTRY | 15 credits |
| Sem 1 | CH2280 | PRINCIPLES OF CHEMICAL ENGINEERING AND PRACTICAL I | 15 credits |
| Sem 1 | CH2284 | PRACTICAL CHEMISTRY AND KEY SKILLS PART A | 15 credits |
| Sem 1 | | BIOCHEMISTRY | n/a |

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | | BIOCHEMISTRY PRACTICAL | n/a |
| Sem 2 | CH2202 | INORGANIC CHEMISTRY | 15 credits |
| Sem 2 | CH2203 | PHYSICAL CHEMISTRY | 15 credits |
| Sem 2 | CH2281 | PRINCIPLES OF CHEMICAL ENGINEERING AND PRACTICAL II | 15 credits |
| Sem 2 | CH2204 | PRACTICAL CHEMISTRY AND KEY SKILLS PART B | 15 credits |
| Sem 2 | | GENERAL OPTIONAL COURSE 2 | n/a |
| Sem 3 | | PRODUCTION PRACTICAL | n/a |

**Notes**
*n/a*

**Level 7/Year 4 2024/25**

**(3+1 students are at University of Leicester)**

Credit breakdown

| **Status** | **Year long** | **Semester 1** | **Semester 2** |
|---|---|---|---|
| Core | 30 credits | 45 credits | 30 credits |
| Optional | n/a | n/a | 15 credits |

120 credits in total

Core modules

| **Delivery period** | **Code** | **Title** | **Credits** |
|---|---|---|---|
| Sem 1 | CH3201 | ADVANCED ORGANIC CHEMISTRY | 15 credits |
| Sem 1 | CH3202 | ADVANCED INORGANIC CHEMISTRY | 15 credits |
| Sem 1 | CH3261 | BSC PROJECT PRACTICAL | 15 credits |
| Sem 2 | CH3203 | ADVANCED PHYSICAL CHEMISTRY | 15 credits |
| Sem 2 | CH3205 | METALS IN SYNTHESIS | 15 credits |
| Year Long | CH3260 | BSc GENERAL PAPER & KEY SKILLS | 15 credits |
| Year Long | CH3262 | BSC PROJECT REPORT | 15 credits |

**Notes**

*n/a*

Option modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Sem 1 | CH3206 | ADVANCED ANALYTICAL CHEMISTRY | 15 credits |
| Sem 1 | CH3208 | ADVANCED MATERIALS CHEMISTRY | 15 credits |

**Notes**

Chose one from the 2 choices listed above.

This is an indicative list of option modules and not definitive of what will be available. Option module choice is also subject to availability, timetabling, student number restrictions and, where appropriate, students having taken appropriate pre-requisite modules.

## Appendix 2: Module specifications

See undergraduate module specification database (Note - modules are organized by year of delivery).

# Appendix 3: Skills matrix

**Programme Specification Appendix 3**

**Skills Matrix: F100 Chemistry**

**Date amended: 17th May 2017**

| Programme Learning Outcomes | English for General Academic Purposes EL0001 | English for Specific Academic Purposes EL0005 | Foundation Chemistry CH0061 | Adv Maths I CH1280 | Adv Maths II CH1281 | General Chemistry CH1200 | Introductory Organic Chemistry CH1201 | Introductory Inorganic Chemistry CH1202 | Introductory Physical Chemistry CH1203 | Introductory Chemistry Practical B CH1205 | Adv Maths III CH1282 | College Physics and Practical A CH1283 | College Physics and Practical B CH1284 | Spectroscopy Theory and Practice CH2200 | Organic Chemistry CH2201 | Inorganic Chemistry CH2202 | Physical Chemistry CH2203 | Chemistry Practical I CH2204 | Chemistry Practical II CH2205 | Principles of Chemical Engineering and Practical I CH2880 | Principles of Chemical Engineering and Practical II CH2881 | Advanced Organic Chemistry CH3201 | Advanced Inorganic Chemistry CH3202 | Advanced Physical Chemistry CH3203 | Advanced Analytical Chemistry CH3206 | Polymer Chemistry and Physics CH3280 | Metals in Organic Synthesis CH3205 | Computational Chemistry CH4207 | Final Year Project I CH3281 | Final Year Project III CH3282 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **(a) Discipline specific knowledge and competencies** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(i) Mastery of an appropriate body of knowledge** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Recall and apply basic chemistry theory across all three main areas of chemistry and related mathematics | | | | X | X | | | | | | X | | | | | | | | | X | X | | | | | | | | | |
| Solve structured model problems | | | X | X | X | X | X | X | X | | X | X | X | X | X | X | X | | | X | X | | | | | | | | | | |
| Solve unseeen model problems | | | | | | | | | | | | | | | | | | | | X | | X | X | X | X | X | X | X | | | |
| Conduct experiments and apply practical techniques | | | | | | | | | | X | | X | X | | | | | X | X | | X | | | | | | | | X | |
| Advanced knowledge of selected areas of organic chemistry | | | | | | | | | | | | | | | | | | | | | | X | | | | X | X | | | |
| Advanced knowledge of selected areas of inorganic chemistry | | | | | | | | | | | | | | | | | | | | | | | X | | | | X | | | |
| Advanced knowledge of selected areas of physical chemistry | | | | | | | | | | | | | | | | | | | | | X | | | X | | X | | X | | |
| Advanced knowledge of selected areas of analytical chemistry | | | | | | | | | | | | | | | | | | | | | X | | | | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(ii) Understanding and application of key concepts and techniques** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Apply chemical concepts in new situations | | | X | | | X | X | X | X | X | | | | X | X | X | X | X | X | X | X | X | X | X | X | | X | | X | X |
| Apply logic and chemical knowledge to make deductions based on (limited) evidence | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | | X | | X | X |
| Design, construct and undertake experiments | | | | | | | | | | | | | | | | | | | X | | X | | | | | | | | X | |
| Demonstrate professional use of standard equipment and knowledge of safety procedures | | | | | | | | | | X | | X | X | | | | | X | X | X | X | | | | | | | | X | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(iii) Critical analysis of key issues** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Critically appraise physical and chemical information | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Summarise key findings of scientific papers. | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| Draw quantitative conclusions from sample data | | | | | | | | | X | X | | X | X | X | | X | X | X | X | X | X | | X | X | X | | | X | X | X |
| Critically assess and compare scientific theories | | | | | | | | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(iv) Clear and concise presentation of material** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Present scientific ideas, data and results in appropriate formats | | | | | | | | | | X | | X | X | | | | | X | X | X | X | X | X | X | X | X | X | X | | X |
| Use chemical software, e.g. drawing, molecular modelling; | | | X | | | | | | | X | | | | | | | | X | X | | X | X | | | | | | X | | X |
| Participate in scientific discussion and debate. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | | X |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(v) Critical appraisal of evidence with appropriate insight** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Discuss and implement experimental methodology | | | | | | | | | | X | | X | X | | | | | X | X | X | X | | | | | | | | X | |
| Collect and critically analyse data; | | | | | | | | | | X | | X | X | | | | | X | X | X | X | | | | | | | | X | |
| Draw valid inferences from data | | | | | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Interrogate and discuss scientific literature. | | | | | | | | | | | | | | | X | X | X | X | X | | | X | X | X | X | X | X | X | X | X | X |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***(vi) Other discipline specific competencies*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Respond to questioning | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| Give a short seminar. | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |

| Programme Learning Outcomes<br>(b) Transferable skills | EL0001 English for General Academic Purposes | EL0005 English for Specific Academic Purposes | CH0061 Foundation Chemistry | CH1280 Adv Maths I | CH1281 Adv Maths II | CH1200 General Chemistry | CH1201 Introductory Organic Chemistry | CH1202 Introductory Inorganic Chemistry | CH1203 Introductory Physical Chemistry | CH1205 Introductory Chemistry Practical B | CH1282 Adv Maths III | CH1283 College Physics and Practical A | CH1284 College Physics and Practical B | CH2200 Spectroscopy Theory and Practice | CH2201 Organic Chemistry | CH2202 Inorganic Chemistry | CH2203 Physical Chemistry | CH2204 Chemistry Practical I | CH2205 Chemistry Practical II | CH2880 Principles of Chemical Engineering and Practical I | CH2881 Principles of Chemical Engineering and Practical II | CH3201 Advanced Organic Chemistry | CH3202 Advanced Inorganic Chemistry | CH3203 Advanced Physical Chemistry | CH3206 Advanced Analytical Chemistry | CH3280 Polymer Chemistry and Physics | CH3205 Metals in Organic Synthesis | CH4207 Computational Chemistry | CH3281 Final Year Project I | CH3282 Final Year Project III |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***(i) Oral communication*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Give reasoned arguments in response to chemical questions | | | | | | | | | | | | | | | | | | | X | | | | | | | | | | X | | X |
| Give a short seminar on a chemical topic | | | | | | | | | | | | | | | | | | | X | | | | | | | | | | X | | X |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***(ii) Written communication*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Write abstracts, tutorial and problem class work, lab notebooks, lab reports and project dissertation | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Communicate scientifically | | X | | | | | | | | X | | | | | | | | X | X | | | | | | | | | | | | X |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***(iii) Information technology*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Use mathematical packages for data analysis | | | | X | X | | | | | X | X | X | X | | | | | X | X | X | X | | | | | | | | | X | X |
| Use spreadsheets, presentation and word processing facilities | | | | X | X | | | | | X | | X | X | | | | | X | X | X | X | | | | | | | | | | |
| Use of scientific software packages, e.g. drawing or molecular modelling | | | | | | | | | | X | | | | | | | | | | X | X | | | | | | | | | | X |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***(iv) Numeracy*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Use analytical and graphical methods | | | | X | X | | | | | | X | X | X | | | | | X | X | X | X | | | | | | | | X | | |
| Analyse data | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Solve numerical problems | | | | X | X | | | | | | X | X | X | X | | | X | X | X | X | X | | | X | | | | | | | |
| Use calculus in Chemistry | | | | X | X | | | | | | | | | | | | X | X | X | X | X | | | X | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***(v) Team working*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Discuss concepts and formulate plans working with peers; organize time and tasks; produce joint reports/presentations; recognize individual strengths. | X | X | | | | | X | X | X | | | | | | | | | | X | | | | | | | | | | X | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***(vi) Problem solving*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Apply knowledge | X | X | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| Analyse and solve familiar and unfamiliar problems | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | |
| Plan and implement laboratory work and projects. | | | | | | | | | | X | | X | X | | | | | X | X | X | X | | | | | | | | | X | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***(vii) Information handling*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Describe and discuss the scientific method | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| Gather, retrieve and manipulate chemical evidence and information from a variety of sources | | | X | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Use electronic scientific databases | | | | | | | | | | | | | | | | | | | | | | | X | | | | | | | X | X |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***(viii) Skills for lifelong learning*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Demonstrate understanding of the professional responsibilities of a chemist | | | | | | | | | | X | | | | | | | | X | X | X | X | | | | | | | | | X | |
| Develop their study and time management skills | X | X | | | | | | | | | | | | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | X | X |
| Learn independently | | | | | | | | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X |
| Access and search scholarly articles and databases | X | X | | | | | | | | | | | | | X | X | X | X | X | | | X | X | X | X | | X | | X | X | X |
| Analyse data | | | X | | | | | | | X | | X | X | | | | | X | X | | X | X | X | X | X | X | X | X | X | X | X |
| Plan and implement group and individual activities. | X | X | | | | | | | | | | | | | | | | | X | | | | | | | | | | X | X | X |