Programme Specification

MSc Electrochemistry and Battery Technologies (2018-19)

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 s/he takes full advantage of the learning opportunities that are provided.

Awarding Institution	University of Southampton
Teaching Institution	University of Southampton
Mode of Study	Full-time
Duration in years	1
Accreditation details	None
Final award	Master of Science (MSc)
Name of award	Electrochemistry and Battery Technologies
Interim Exit awards	Postgraduate Certificate in Higher Education
	Postgraduate Diploma in Higher Education
FHEQ level of final award	Level 7
UCAS code	N/A
Programme code	8202
QAA Subject Benchmark or other external reference	Master's Degree Characteristics 2016
Programme Lead	Guy Denuault (gd)

Programme Overview

Brief outline of the programme

The Southampton Electrochemistry Group has a leading international reputation for both research and education. The group is spread across Chemistry in the Faculty of Natural and Environmental Sciences and Engineering Sciences in the Faculty of Engineering and the Environment. Research spans the breadth of modern electrochemistry from fundamental studies of electrode surfaces and reactions through to applications in sensors, batteries, and fuel cells. The group has been active in education in Electrochemistry for over 40 years, hosting an annual summer school attended by 20 to 40 delegates per year from across the world.

This taught MSc builds upon our international reputation for excellence in research and education in Electrochemistry by offering an advanced, postgraduate education in Electrochemistry and Battery Technologies from the fundamental principles through to applications in energy storage, energy conversion and Electrochemical

Engineering. The programme provides opportunities for you to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in these areas.

The programme has been developed with reference to the benchmark statements for chemistry developed by the Quality Assurance Agency (2007):

· to instil an enthusiasm for electrochemistry and battery science, an appreciation of their applications in different contexts and to involve you in an intellectually stimulating and satisfying experience of learning and studying;
· to establish an appreciation of the importance and sustainability of the chemical sciences in an industrial, academic, economic, environmental and social context;
· to develop, through an education in chemistry, a range of appropriate generic skills, of value in chemical and non-chemical employment;
· to extend your comprehension of key chemical concepts as applied to Electrochemistry and battery processes and so provide you with an in-depth understanding of this specialised area of chemistry;
· to provide you with the ability to plan and carry out experiments independently and assess the significance of outcomes;
· to develop your ability to adapt and apply methodology to the solution of unfamiliar types of problems;
· to instil a critical awareness of advances at the forefront of Electrochemistry and Battery Technologies;
· to prepare you effectively for professional employment or doctoral studies.

Your contact hours will vary depending on your module/option choices. Full information about contact hours is provided in individual module profiles.

Learning and teaching

The Taught Component

Learning and teaching methods will include:

· lectures, tutorials, workshops, seminars, and demonstrations delivered by world-leading researchers and educators in the fundamental and applied aspects of electrochemistry;
· directed reading in terms of summary texts and primary scientific literature;
· student-led seminars and presentations (verbal and poster) and contributions to regular research group meetings;
· exposure to technical reports, including literature searches and surveys;
· self-led, practical research project work;
· workshops and tutorials designed to deepen your understanding of concepts and to develop your critical thinking;
· individual practical work;
· group practicals designed to teach instrumental electrochemical techniques and their application to battery research and development;
· regular meetings about research work with the supervisory team, with the lead academic as the key provider of guidance;
· engagement with written assignments and other activities associated with the coursework component of the subject and skills component of study;
· revision for written examinations that are a ubiquitous aspect of the MSc qualification.

The Research Project

In the third semester you will carry out a research project that will enable you to explore one (or more) of the aspects of electrochemistry and battery science covered in the taught part of the course in greater depth. MSc level research projects should realistically offer the opportunity of producing results that would be of a standard to publish in the peer reviewed literature.

Supervisors will be assigned at the start of the second semester and the specific project topic will be agreed with your academic research supervisor. A limited number of industry-based research placement opportunities may be available and it may be possible to complete the practical aspects of your research project whilst on placement. Interested students should approach the programme lead to discuss potential industrial hosts. Such placements would typically require the students to apply directly to the industrial partner. If successful an on-site industrial supervisor and a Southampton-based academic supervisor will jointly supervise such placement projects.

During the project preparation stage in the second semester, you will plan the project, in consultation with your

academic supervisor, and estimate the time to be spent on each element of the plan. In addition you will carry out a preliminary literature review of your area of research before arriving at a clear judgement of your overall objectives and how they will build on the current level of knowledge in your area of research. You will present an overview containing these elements to your project supervisory team before the end of semester 2, which will be assessed.

During the third semester you will have regular, typically fortnightly, meetings with either your supervisor or advisor as you complete your research project. You will write brief six-weekly reports of research progress, which will be assessed in writing by the supervisor and advisor. This will allow your progress to be discussed and reviewed against the objectives for each period. At the end of the research period, you will present an overview of your research findings to your supervisory team and, together with your earlier reports, this will be used to plan your dissertation.

Assessment

The Taught Component

The programme makes use of a variety of learning and teaching methods including traditional lectures, smaller interactive workshops, interactive skills sessions, taught practical sessions in a teaching laboratory environment and a significant research project to take place under the supervision of an individual member of academic staff or on placement supervised jointly by a named line manager at the placement and an individual member of academic staff from Southampton. All your chemistry and skills centred learning is taken at FHEQ Level 7 (which maps to CHEM6XXX modules). This range of methods is employed as appropriate to each module so as to deliver the programme learning outcomes as a whole and the learning outcomes of each module. A learning outcome map is provided as Appendix 1 to the programme specification document.

A range of assessment methods is also used including traditional examinations, the submission of coursework including practical reports, presentations, oral examinations, and the submission of a dissertation. The exams will be designed to ensure that you have (a) achieved the learning outcomes of each module and (b) the level of sophistication of your understanding is of an appropriate standard. Coursework will also be designed to test that you have met the learning outcomes specified. The proportion of marks derived from coursework and examinations is clearly stated in the module descriptions and will be that which is judged to most suit the content of the module and learning outcomes. Most scientific modules are assessed by examination while more skills based courses tend towards a higher proportion of coursework. As for the teaching methods, the assessment methods have been selected to be appropriate for each module, whilst delivering the learning outcomes of the programme as a whole as described below (the numbers reflect the learning outcomes listed in Appendix 1):

Examinations: these are used to ensure achievement of increased knowledge and understanding of advanced aspects of chemistry beyond those covered at first-degree level (1), the demonstration of problem solving skills (15), and illustration of independent learning (17).
Past examination papers are available through the library website www.soton.ac.uk/library/resources/index.html under 'exam papers online' and also on the Staff Student Liaison Blackboard site under the appropriate heading.

Coursework: the submission of course work, e.g. the reports required for CHEM6135 Practical Techniques in Electrochemistry ensures that good laboratory practice (2, 26), data analysis and experimental design (3, 27, 28, 29), planning of safe working practice (4), problem solving (15), initiative (17), use of databases (20), critical reading (21), communication (23), ability to select appropriate techniques (28), and critical evaluation of results (30) are assessed. Additionally, the completion of the course work for CHEM6133 Scientific writing and presentation skills for Chemistry MSc will ensure that exploitation of research (7), understanding and evaluation of published work (8, 9), and communication with professionals (16) are assessed.

Oral examinations are included as part of CHEM6133 Scientific writing and presentation skills for Chemistry MSc and CHEM6142 MSc Research project as the ability to communicate orally (23) is a key skill.

The Research Project

The research component will be assessed on the basis of the practical outcomes of your project work and on your ability to communicate these, and your background understanding, through the authorship of a scientific dissertation. Two independent examiners from within the University of Southampton will assess the written thesis independently and then conduct a viva voce (verbal examination).

You will also be required to maintain a laboratory notebook and to create a suitable archive and organisation of

your research results. These primary sources of information will be reviewed throughout the duration of your research project and will be part of the final assessment.

You will be required to produce short reports describing your progress throughout the summer. These will be reviewed and feedback provided in a suitable timeframe to allow for your development in advance of the next report. The outcomes of these reviews do not contribute to the final grade. However, past experience clearly demonstrates that a high standard of performance in these regular reports greatly assists in the preparation of a high quality final dissertation.

The Dissertation (see curriculum map provided in appendix 1) provides a means of assessing all of the learning outcomes of the programme at the end of the student's period of study. In particular assessment of the research project and the Dissertation provides a means of assessing the student's critical ability (7), allowing them to demonstrate that they are able to address a research problem (3,10), by applying and adapting methodology creatively to the solution of an unfamiliar problem (12, 13), present their research results objectively (14), and to communicate those results to a specialist audience (15). The two independent academics' assessment of the learning outcomes for the dissertation project ensures that the student is able to demonstrate the transferable and generic skills (16-27) and subject specific practical skills (28-31).

Special Features of the programme

The programme features a progressive approach to both practical aspects of electrochemistry, which is developed through CHEM6135 and then the project, and written and presentation skills, which are developed through the scientific writing and presentation skills module followed by the dissertation project. The dissertation project is completed full time during the third semester and may be completed as a placement in the laboratories of an approved industrial partner.

Please note: As a research-led University, we undertake a continuous review of our programmes to ensure quality enhancement and to manage our resources. As a result, this programme may be revised during a student's period of registration; however, any revision will be balanced against the requirement that the student should receive the educational service expected. Please read our Disclaimer to see why, when and how changes may be made to a student's programme.

Programmes and major changes to programmes are approved through the University's programme validation process which is described in the University's Quality handbook.

Educational Aims of the Programme

The specific aims of the MSc in Electrochemistry and Battery Technologies, developed with reference to the QA descriptor for higher education qualification at level 7 / Master's degree (2011) are to:

- provide students with the opportunity to develop advanced knowledge in the arena of Electrochemistry and to critically apply this knowledge to an area of research, which is at the forefront of the discipline;
- provide students with the opportunity to work with modern electrochemical instrumentation in state-of-the-art laboratories, so that they are able to demonstrate a comprehensive understanding of modern electrochemical techniques applicable to their own research or advanced scholarship;
- enable students to demonstrate originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge within the discipline of Electrochemistry and in particular to Battery Technologies;
- foster a deep conceptual understanding of Electrochemistry so that the students can critically evaluate current research and advanced scholarship, evaluate new methodologies, develop critiques, and propose new hypotheses;
- enable students to pursue a career in Electrochemistry, Energy Storage and/or Electrochemical Engineering in either an academic or industrial setting.

Programme Learning Outcomes

Knowledge and Understanding

On successful completion of this programme you will have knowledge and understanding of:

A1. a thorough understanding of the fundamental scientific and technical aspects of electrochemistry and battery technologies;

A2. awareness of the application of electrochemical techniques and methodologies to solve a variety of technical and environmental challenges;

A3. critical ability, as demonstrated by a research project/dissertation which advances a specific area of research;

A4. sufficient breadth of technical background to permit study of the current literature, identification of gaps in information, and engagement in discussion with peers and a wide range of audience;

A5. awareness of the limitations of current knowledge and the changing nature of technologies and the need to gain new knowledge through further study and teamwork in your professional field;

A6. a thorough understanding of good laboratory practice, electronic recording, data management, and exploitation of results;

A7. an understanding of the planning required to ensure safe working practice, including evaluation of hazards and environmental effects;

A8. experience of working within a small team to achieve a common research goal.

Subject Specific Intellectual and Research Skills

On successful completion of this programme you will be able to:

B1. find, read, understand and explain scientific publications related to the chosen area of research;

B2. demonstrate skills in critical evaluation of primary and secondary scientific literature and the ability to develop your knowledge and understanding on the basis of this evaluation;

B3. address and resolve a research problem in the chosen specialist area;

B4. design and implement research strategies for solving problems in the chosen research area;

B5. adapt and apply methodology systematically and creatively to the solution of unfamiliar problems;

B6. assimilate, critically evaluate, and present research results objectively, making sound judgements in the absence of complete data;

B7. communicate the conclusions of a research project clearly to both specialist and non-specialist audiences.

Transferable and Generic Skills

On successful completion of this programme you will be able to:

C1. developed problem-solving skills including the demonstration of self-direction, originality, and autonomy in planning and implementing tasks at a professional level

C2. the ability to communicate and interact with professionals from other disciplines

C3. the ability to exercise initiative and personal responsibility

C4. the ability to make decisions in complex and unpredictable situations

C5. developed independent learning ability required for continuing professional development.

C6. the effective use of printed and on-line catalogues, websites and databases to locate relevant technical information;

C7. the compilation of knowledge and understanding through critical reading of research material;

C8. the application of such knowledge and understanding to specialist problems in chemical research;

C9. communication of specialist technical information in written and verbal forms to a variety of audiences;

C10. effective time management so as to achieve a desired research goal in a given timeframe;

C11. the ability to develop and apply technical skills in the independent resolution of sophisticated theoretical problems;

C12. the ability to assess risks and to design safe working practice.

Subject Specific Practical Skills

On successful completion of this programme you will be able to:

D1. demonstrate the ability to select appropriate techniques and procedures

D2. demonstrate competence in the planning, design and execution of experiments

D3. demonstrate the skills required to work independently and be self-critical in the evaluation of risks, experimental procedures and outcomes

D4. use an understanding of the limits of accuracy of experimental data to inform the planning of future work.

Programme Structure

The programme structure table is below:

Information about pre and co-requisites is included in individual module profiles.

Part I

Typical course content

The MSc in Electrochemistry and Battery Technologies is of 12 months duration. The taught part of the programme is confined within two teaching semesters (Oct to Jan followed by Feb to June). Each semester includes twelve weeks of study followed by two or three weeks of examinations in which any end of module assessments will take place. The research component takes place in semester 3, which runs from June to September (see scheme below).

The programme is delivered in a series of modules. Each taught module ranges from 3.75, 7.5 to 30 ECTS points (European Credit and Transfer System). As a rough guide a 7.5 ECTS point module requires 150 hours of work. This would include all work i.e. formal lectures, assignments, revision, examination tutorials etc. plus independent study.

Your theory and skills courses will be confined to the two semester teaching periods mentioned above. The core modules are taught according to the prescribed order presented in the scheme but you will have a free choice for one optional module module worth 7.5 ECTS from a list of relevant modules.

The practical phase of your research project will be completed from June until mid-August. It is anticipated that the final weeks of August will involve a concentrated period of dissertation preparation with a very limited amount of laboratory work being completed.

The general safety induction lectures will be given during the graduate induction days, together with distribution of the Safety Booklet. Follow up lectures targeting key areas of Health and Safety will be available and you will be required to attend the ones relevant to your research. You can anticipate that there will be 3-4 more sessions after the safety induction.

Part I Compulsory

Code	Module Title	ECTS	Type
CHEM6152	Battery Materials and Characterisation	3.75	Compulsory

CHEM6150	Battery Technologies and their Applications	7.5	Compulsory
CHEM6022	Introduction to Electrochemistry I	7.5	Compulsory
CHEM6134	Introduction to Electrochemistry II	7.5	Compulsory
CHEM6136	Modelling in Electrochemistry	3.75	Compulsory
CHEM6151	Practical Techniques in Battery Research	7.5	Compulsory
CHEM6135	Practical Techniques in Electrochemistry	7.5	Compulsory
CHEM6133	Scientific writing and presentation skills for Chemistry MSc	7.5	Compulsory

Part I Core

Code	Module Title	ECTS	Type
CHEM6142	Chemistry MSc Advanced Research Project	30	Core

Part I Optional

Select a further 7.5 ECTS worth of modules from appropriate FHEQ Level 7 modules from either Chemistry or Engineering
Detailed module descriptions including the breakdown of coursework and examination elements for each module are available online at http://www.southampton.ac.uk/chemistry/undergraduate/modules.page
(where an indicative list of options can be found. We cannot guarantee to offer every option each year);

Note that all students must also attend mandatory Safety Course sessions as part of CHEM6142 and attend the general safety induction, given during the graduate induction days, together with distribution of the Safety Booklet. Follow up lectures targeting key areas of Health and Safety will be available and you will be required to attend the ones relevant to your research. You can anticipate that there will be 3-4 more sessions after the safety induction.

Code	Module Title	ECTS	Type
CHEM6096	Advanced Physical Chemistry	7.5	Optional
CHEM6147	Advanced Spectroscopy and Applications	7.5	Optional
CHEM6144	Chemistry through the Computational Microscope	7.5	Optional
CENV6090	Energy Resources and Engineering	7.5	Optional

FEEG6007	Fuel Cells and Photovoltaic Systems 1	7.5	Optional
FEEG6008	Fuel Cells and Photovoltaic Systems 2	7.5	Optional
SESG6041	Introduction to Energy Technologies, Environment and Sustainability	7.5	Optional
CHEM6149	Principles, Techniques and Energy Applications of Electrochemistry	7.5	Optional
SESM6032	Sustainable energy systems, resources and usage	7.5	Optional
CHEM6146	X-Ray Crystallographic Techniques, Advanced Main Group Chemistry and Applications	7.5	Optional
CHEM6153	X-Ray Diffraction as a Characterisation Method	7.5	Optional

Part II (Year 1)

Code	Module Title	ECTS	Type
CHEM6142	Chemistry MSc Advanced Research Project	30	Core

Progression Requirements

The programme will follow the University's regulations for ***Progression, Determination and Classification of Results: Undergraduate and Integrated Masters Programmes*** or the University's regulations for ***Progression, Determination and Classification of Results: Standalone Masters Programmes*** as set out in the General Academic Regulations in the University Calendar: http://www.calendar.soton.ac.uk/sectionIV/sectIV-index.html

Support for student learning

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular Faculty or discipline area.

The University provides:

- library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources
- high speed access to online electronic learning resources on the Internet from dedicated PC Workstations onsite and from your own devices; laptops, smartphones and tablet PCs via the Eduroam wireless network. There is a wide range of application software available from the Student Public Workstations.
- computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources)
- standard ICT tools such as Email, secure filestore and calendars.

- access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move.
- IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library.
- Enabling Services offering support services and resources via a triage model to access crisis management, mental health support and counselling. Support includes daily Drop In at Highfield campus at 13.00 – 15.00 (Monday, Wednesday and Friday out of term-time) or via on-line chat on weekdays from 14.00 – 16.00. Arrangements can also be made for meetings via Skype.
- assessment and support (including specialist IT support) facilities if you have a disability, long term health problem or Specific Learning Difficulty (e.g. dyslexia).
- the Student Services Centre (SSC) to assist you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards
- Career and Employability services, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV
- Other support that includes health services (GPs), chaplaincy (for all faiths) and 'out of hours' support for students in Halls and in the local community, (18.00-08.00)
- A Centre for Language Study, providing assistance in the development of English language and study skills for non-native speakers.

The Students' Union provides

- an academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students' views to the University.
- opportunities for extracurricular activities and volunteering
- an Advice Centre offering free and confidential advice including support if you need to make an academic appeal
- Support for student peer-to-peer groups, such as Nightline.

Support within Southampton Chemistry

We provide a friendly and supportive environment for you to pursue your studies. This is managed in a system that provides academic support for all students utilising the expertise of all the staff as appropriate. The various people and systems-based support available are noted below.

In Southampton Chemistry you will:

· Receive an induction that will introduce you to all our teaching and learning resources you will interface with during your degree as well as ensuring you understand the regulations which govern your study;
· Have a personal tutor who will advise on choice of taught modules and provide pastoral support;
· Receive individually tailored guidance from academic staff delivering the taught components of your programme. Each module has an academic coordinator who would be the first point of contact in the event of needing academic support;
· Be able to obtain additional support from the senior staff involved in the MSc Programme. These include the Director of the MSc degree and the Director of Programmes.
· Have a personal e-mail account, web access, specialist software relevant to your work and IT support from the University i-Solutions team;
· Attend group meetings in the selected research group and research seminars given by visiting speakers.

Administrative staff in the Faculty Student Office support both staff and students in the administration of postgraduate teaching within Southampton Chemistry. This is normally your first port of call for issues relating to the administration of your programme (e.g. registration, timetables, module courses, coursework submission, sickness and absence, examinations, etc.).

Methods for evaluating the quality of teaching and learning

You will have the opportunity to have your say on the quality of the programme in the following ways:

· Completing student evaluation questionnaires for each module of the programme
· Acting as a student representative on various committees, e.g. Staff:Student Liaison Committees, Faculty Programmes Committee, Chemistry Educational and Quality Committee, OR providing comments to your student representative to feedback on your behalf.

- Serving as a student representative on Faculty Programmes Scrutiny Groups for programme validation
- Taking part in programme validation meetings by joining a panel of students to meet with the Faculty Programmes Scrutiny Group.

The ways in which the quality of your programme is checked, both inside and outside the University, are:

- Regular module and programme reports which are monitored by the Faculty
- Programme validation, normally every five years.
- External examiners, who produce an annual report
- Accreditation approval processes carried out by the Royal Society of Chemistry
- A national Research Assessment Exercise (our research activity contributes directly to the quality of your learning experience)
- Institutional Review by the Quality Assurance Agency

Further details on the University's quality assurance processes are given in the *Quality Handbook.*

Career Opportunities

Employability is about more than just getting a job. We believe in helping our students gain the necessary experience for a future career, along with the skills to identify opportunities and make the most of them.
It is reassuring to know that Chemistry degrees are third only behind Medicine and Dentistry as the degree which offers the highest financial return over the term of the graduate's career, but the rewards of a Chemistry degree lie at a deeper personal level and not just in terms of financial return.
During your year here you will have the opportunity to broaden your options by meeting employers, getting involved in volunteering activities, work placements and much more.
A significant proportion of our graduates decide to go into research by taking a PhD qualification, most of them staying in Southampton. But careers in industry and commerce are available even in the toughest economic times.

There are also research and teaching opportunities and the options to branch out into other fields such as medicine, pharmaceuticals, even finance, and the law and science journalism. This is because chemistry gives you the confidence to take on so many varied challenges in life.

With a Chemistry degree from the University of Southampton your career path will be limited only by the level of your commitment and determination.

External Examiner(s) for the programme

Name: Professor A. Robert Hillman - University of Leicester

Students must not contact External Examiner(s) directly, and external examiners have been advised to refer any such communications back to the University. Students should raise any general queries about the assessment and examination process for the programme with their Course Representative, for consideration through Staff: Student Liaison Committee in the first instance, and Student representatives on Staff: Student Liaison Committees will have the opportunity to consider external examiners' reports as part of the University's quality assurance process.

External examiners do not have a direct role in determining results for individual students, and students wishing to discuss their own performance in assessment should contact their Personal Academic Tutor in the first instance.

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 s/he takes full advantage of the learning opportunities that are provided. More detailed information can be found in the programme handbook.

Appendix 1:

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. In addition to this, students registered for this programme also have to pay for:

Additional Costs

Type	Details
Software Licenses	All software is provided
Clothing	One laboratory coat and a pair of safety spectacles are provided at the start of the programme to each student. If these are lost the student must replace them at their own expense.
Hardware	It is advisable that students provide their own laptop or personal computer, although shared facilities are available across the University campus.
Computer discs or USB drives	Students are expected to provide their own portable data storage device.
Stationery	You will be expected to provide your own day-to-day stationary items, e.g. pens, pencils, notebooks, etc.). Any specialist stationery items will be specified under the Additional Costs tab of the relevant module profile.
Textbooks	Where a module specifies core texts these should generally be available on the reserve list in the library. However due to demand, students may prefer to buy their own copies. These can be purchased from any source. Some modules suggest reading texts as optional background reading. The library may hold copies of such texts, or alternatively you may wish to purchase your own copies. Although not essential reading, you may benefit from the additional reading materials for the module.
Laboratory Equipment and Materials	All laboratory equipment and materials are provided
Approved Calculators	Candidates may use calculators in the examination room only as specified by the University and as permitted by the rubric of individual examination papers. The University approved models are Casio FX-570 and Casio FX-85GT Plus. These may be purchased from any source and no longer need to carry the University logo.
Printing and Photocopying Costs	Where possible, coursework such as essays; projects; dissertations is likely to be submitted on line. However, there are some items where it is not possible to submit on line and students will be asked to provide a printed copy. Current University printing costs can be found at http://www.southampton.ac.uk/isolutions/students/printing-for-students.page Please Note: Paper sizes not recognised by the printing devices will prompt you to select the size and then charge a minimum of 50p per black and white copy and a maximum of £1 per colour copy. You can pay for your printing by using the money loaders or by using print copy payment service by going to https://www.printcopypayments.soton.ac.uk/ Please remember that we are unable to refund any credit that has not been used by the end of your course, so please consider this when topping up your printing/copy account You will be given a printing allowance towards the costs of printing lecture handouts and/or practical scripts.

	The University Print Centre also offer a printing and copying service as well as a dissertation/binding service. Current printing and copying costs can be found at http://www.southampton.ac.uk/printcentre/copyrooms/service.page They also provide a large format printing service, e.g. Academic posters. Details of current costs can be found at http://www.southampton.ac.uk/printcentre/exhibition/academicposters.page ?.

In some cases you'll be able to choose modules (which may have different costs associated with that module) which will change the overall cost of a programme to you. Details of such costs will be listed in the Module Profile. Please also ensure you read the section on additional costs in the University's Fees, Charges and Expenses Regulations in the University Calendar available at www.calendar.soton.ac.uk.