BSc Chemistry with Archaeology **UCAS Code: F1V4**
For students entering Part 1 in 2006

Awarding Institution:	The University of Reading
Teaching Institution:	The University of Reading
Relevant QAA subject benchmarking group:	Chemistry
Faculty of Science	Programme Length: 3 years
	Date of specification: Feb 2008
Programme Director:	Dr MJ Almond
Programme Adviser:	Drs MJ Almond and EM Page
Board of Studies:	Chemistry
Recognition:	The Royal Society of Chemistry

Summary of programme aims and learning outcomes:
The programme is designed to provide a broad and rigorous study of modern Chemistry and to provide knowledge of key areas of modern archaeology. It is designed to receive recognition by the Royal Society of Chemistry. (For a fuller statement of the programme aims and learning outcomes see below.)

Transferable skills
The University's Strategy for Teaching and Learning has identified a number of generic transferable skills which all students are expected to have developed by the end of their degree programme. In following this programme, students will have had the opportunity to develop their skills relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team-working and use of information technology.

As part of this programme students are expected to have gained experience and show competence in the following skills: IT (word-processing, use of spreadsheets and databases), scientific writing, oral presentation, team-working, problem-solving, use of library resources, time-management, and career planning and management.

Programme content
The BSc Chemistry with Archaeology degree programme is divided into three Parts, each of 120 credits. The degree profile outlined below lists the compulsory modules and gives some indication of the optional modules from which the student must make a selection. Students choose such optional modules in consultation with the Programme Adviser or the Programme Director. The number of credits for each module is given after its title.

Part 1 (three terms 2006-2007)
Compulsory Modules (90 or 100 credits)

		Credits	*Level*
CH1I1	*Introduction to Inorganic Chemistry*	20	C
CH1O1	*Introduction to Organic Chemistry*	20	C
CH1P1	*Introduction to Physical Chemistry*	20	C
AR1TS3	*Practising Archaeology: methods and approaches*	20	C
CH1SK1	*Skills for Chemists*	10	C

The following module is **compulsory** for students who do not have an A or AS level pass in Mathematics and must be taken in place of CH1SK1.

CH1M	*Chemistry M*	20	C

The following module is **compulsory** for those students with an A level pass at grade **C-E** and **optional** for those with a grade **A-B**.

CH1M2	*Mathematics for Chemistry2*	10	C

Optional modules (10 or 20 or 30 credits)

Students who are not required to take CH1M or CH1M2 will select **one** of the following two 20 credit modules plus a further 10 credit module from outside the School of Chemistry.

Students who take CH1M or CH1M2 will select one of the following two 20 credit modules.

		Credits	Level
AR1P2	*Primates to Pyramids: an introduction to world prehistory*	20	C
AR1RM2	*From Rome to the Reformation: an introduction to historic archaeology*	20	C

Part 2 (three terms) (2007-2008)

Compulsory Modules (120 credits)

CH2I1	Inorganic Chemistry 2	20	I
CH2O1	Organic Chemistry 2	20	I
CH2P1	Physical Chemistry 2	20	I
CH2A1	Analytical Chemistry & Professional Skills 2	20	I
AR2S1	Archaeological Science	20	I
AR2F4	Silchester Field School	10	I
AR2F6	Techniques in Skeletal Interpretation	10	I

Part 3 (three terms) (2008-2009)

Compulsory modules (60 credits)

CH3A1	*Analytical Chemistry & Professional Skills 2*	20	H
and			
CH3PR	*Project*	40	H

Optional modules (60 credits)

Four 10 credit modules **must** be selected from the following:

CH3I1	*Multinuclear Metal Systems and Organometallics*	10	H
CH3I2	*Shapes and Structures of Small Molecules and Extended Arrays*	10	H
CH3O1	*Advanced Organic Chemistry- Synthesis of Complex Targets*	10	H
CH3O2	*Advanced Organic Chemistry- Contemporary Synthetic Methodology*	10	H
CH3P1	*Advanced Topics in Physical Chemistry 1*	10	H
CH3P2	*Advanced Topics in Physical Chemistry 2*	10	H

Additionally **one** 20 credit module must be selected from the following list.

AR3S6	*Paleopathology*	20	H
AR3S4	*Micromorphology and the study of early agricultural and urban settlements and landscapes*	20	H
AR3S8	*Biomolecular Archaeology*	20	H

Progression from Part 1 to Part 2:

To gain a threshold performance at Part 1 a student shall normally be required to achieve an overall average of 40% over 120 credits taken in Part 1, and a mark of at least 30% in individual modules amounting to not less than 100 credits. In order to progress from Part 1 to Part 2, a student shall normally be required to achieve a threshold performance at Part 1 **and**

not less than 40% in the compulsory core modules (CH1I1, CH1O1 and CH1P1) averaged together **and**
not less than 40% in the practical chemistry components of the core modules averaged together and
not less than 40% in the compulsory Archaeology modules (AR1TS1) and either AR1P1 or AR1RM1)

Progression from Part 2 to Part 3
To gain a threshold performance at Part 2 a student shall normally be required to achieve: an overall average of 40% over 120 credits taken in Part 2, and a mark of at least 30% in individual modules amounting to not less than 100 credits. In order to progress from Part 2 to Part 3, a student shall normally be required to achieve a threshold performance at Part 2, **and**

not less than 40% in the core modules (CH2I1, CH2O1, CH2P1 and CH2A1) averaged together **and**
not less than 40% in the practical chemistry components of the core chemistry modules averaged together **and**
not less than 40% in each of the compulsory Archaeology modules (AR2S1, AR2F4S and AR2F6)

A pass of at least 40% in module CH3PR or CH3PRE is required to qualify for an honours degree.

Students who do not average 40% in their Archaeology modules in Part 1 or Part 2 but who are otherwise qualified may transfer to the BSc Chemistry programme.

Summary of Teaching and Assessment
Teaching is organised in modules that involve a combination of lectures, tutorials, workshops and practical sessions. Modules are assessed by a mixture of coursework and formal examinations. At least 50% of the assessment will normally be by formal examination except for the Part 3 project and the Silchester Field School, which will be assessed through laboratory or field work, the written report and an oral presentation.

Part 2 contributes one third and Part 3 contributes two thirds towards the Final Degree classification.
The University's honours classification is as follows:

Mark	Interpretation
70% - 100%	First class
60% - 69%	Upper Second class
50% - 59%	Lower Second class
40% - 49%	Third class
35% - 39%	Pass below Honours standard
0% - 35%	Fail

Admission requirements
Entrants to this programme are normally required to have obtained:
Grade C or better in Mathematics and English in GCSE; and to have achieved
UCAS tariff: 260 from 3 A levels including B in Chemistry (two AS grades are acceptable in place of one A-level), or
International Baccalaureate: 30 points including 6 in chemistry, or
Scottish Highers: BBBB including B in Chemistry, or
Irish Leaving Certificate: BBBBC including B in Chemistry.

Admissions Tutor: Dr J M Elliott email: j.m.elliott@rdg.ac.uk

Support for students and their learning
University support for students and their learning falls into two categories. Learning support includes IT Services, which has several hundred computers and the University Library, which across its three sites holds over a million volumes, subscribes to around 4000 current periodicals, has a range of electronic sources of information and houses the Learning Resource Centre with some 200 workstations. There are language laboratory facilities both for those students studying on a language degree and for those taking modules offered by the Institution-wide Language Programme. Student guidance and welfare support is provided by Personal Tutors, the Careers Advisory Service, the University's Special Needs Advisers, Hall Wardens and the Students' Union.

Within the Department of Chemistry additional support is given through practical classes and tutorials in every Part of the degree programme. There are Course Advisers for every Part of the programme and the Director of Undergraduate Studies is also available for consultation and advice on academic and personal matters.

Careers prospects
A BSc degree in Chemistry with Archaeology from the University of Reading provides a strong platform from which to undertake a wide range of careers both within the chemical community and outside. The degree contains a core of chemistry modules and as such Chemistry with Archaeology graduates will have available to them most of the career options that are also available to BSc Chemistry graduates. Chemists are highly valued for their numerical and problem solving skills as well as their technical knowledge. They can use their chemical knowledge as research workers, technical assistants, or sales and marketing personnel within the chemical industry. Alternatively, Chemistry graduates from Reading have found employment using their numerical and other skills in more general areas such as accounting and computing. In addition, some students with a BSc chemistry degree pursue postgraduate work, either at Reading or elsewhere, by studying for a higher degree in specialised areas of Chemistry. Chemistry with Archaeology graduates will be qualified to follow all of the career paths listed above. In addition they will gain specialised knowledge of scientific archaeology and of analytical chemistry. This will allow employment in areas where analytical chemistry is utilised to investigate archaeological problems.

Opportunities for study abroad
Only limited opportunities for study abroad are available in this programme. The programme specification does not allow language modules to be taken, as such study abroad would only be available to those students who already have sufficient language skills. For those students it would be possible for a non-assessed year abroad to be intercalated between parts 2 and 3 of the programme.

Programme outcomes
The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

Knowledge and Understanding

A. Knowledge and understanding of:

1. the fundamental concepts and techniques of chemistry
2. a selection of more specialist topics in the three main branches of the subject and in analytical chemistry
3. the main techniques involved in practical work
4. the spectroscopic methods used to identify molecules and to determine their structure and the basics of the underlying theory
5. specialised topics in archaeology particularly in scientific archaeology
6. the principles of archaeological fieldwork

Teaching/learning methods and strategies

The knowledge required for the basic topics is provided in formal lectures supported by problem sets for students to tackle on their own and which are discussed formally in tutorial sessions with members of staff.

Practical classes are held throughout Parts 1 & 2 in which students develop their skills prior to applying them in their Part 3 project.

Feedback on student work is provided by the discussion and return of work in tutorials and by regular workshop sessions during which students tackle unseen problems in the presence of academic staff who provide support.
All practical work is marked and returned to the student.

Assessment
Most knowledge is tested through a combination of coursework and unseen formal examinations, although 3 and 6 are assessed by coursework. Dissertations and oral presentations also contribute to assessment, particularly in Part 3.

Skills and other attributes

B. Intellectual skills – be able to:

1. think logically
2. analyse and solve problems
3. organise tasks into a structured form
4. understand the evolving state of knowledge in a rapidly developing area
5. transfer appropriate knowledge and methods from one topic within the subject to another
6. plan, conduct and write a report on an independent project.

Teaching/learning methods and strategies

Logic is an essential part of the understanding and construction of synthetic methods and mechanistic pathways which form the framework for much organic and inorganic chemistry.

While not exclusively the preserve of physical chemistry, problem solving plays a major part in this section of the course and in the Silchester Field School.

Latest developments in the subject are introduced where appropriate, particularly in Part 3.

Practical reports in Part 1 & 2 provide training for the Part 3 project report.

Assessment
1-4 are assessed directly and indirectly in most parts of this chemistry with archaeology programme, while 5 contributes to the most successful work.
6 is assessed in the Part 3 project report.

C Practical Skills:- be able to

1. follow practical instructions safely and accurately
2. carry out a variety of experimental procedures
3. measure and interpret various spectroscopic techniques
4. interpret quantitatively the results of their experiments
5. formulate safety protocols
6. devise suitable experimental methods for tackling a particular problem
7. carry out archaeological study in the field

Teaching/learning methods and strategies

Detailed practical manuals are provided for all practical courses in Parts 1 & 2, together with sources of recommended further reading. Staff and post-graduate demonstrators are present during every practical session to guide and help students and to mark their reports.

Workshop sessions are held to assist students in interpreting spectroscopic information obtained on unknown compounds.

In Part 3 students work on individual projects under the supervision of one or more members of staff.

Assessment

1 to 4 are tested to different extents by the practical work associated with Parts 1 & 2 of the chemistry course and in Archaeological Science

3 is assessed through problems set in written examinations.

5 is specifically assessed during the organic practical course in Part 2, although safe working procedures are emphasised at every stage.

3 is specifically but not exclusively assessed within core modules CH2A1 and CH3A1.

6 is assessed in the Part 3 project.

7 is assessed through the Silchester Field School

D. Transferable skills – be able to:

1. use IT (word-processing, spreadsheets and chemical databases)
2. communicate scientific ideas
3. give oral presentations
4. work as part of a team
5. use library resources
6. manage time
7. plan their career

Teaching/learning methods and strategies

The use of IT is embedded throughout the programme but, is specifically addressed in the core module CH1SK1.

Team work and career planning are part of module CH2A1 and teamwork is also a major component of the Silchester Field School. Oral presentations are associated with modules CH3A1 and CH3PR.

Library resources are specifically addressed through a small project in module CH3A1, and within the third year project.

Time management is essential for the timely and effective completion of the programme

Assessment

1 - 5 contribute assessed coursework within the two compulsory modules on analytical and professional skills, CH2A1 and CH3A1.

Career planning is assessed through the 5 credit CMS course embedded within module CH2A1.

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 takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the module description and in the programme handbook. The University reserves the right to modify this specification in unforeseen circumstances, or where the process of academic development and feedback from students, quality assurance processes or external sources, such as professional bodies, requires a change to be made. In such circumstances, a revised specification will be issued.