

University College Dublin

Periodic Quality Review

UCD School of Geological Sciences

April 2011

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Appendix 1: The UCD School of Geological Sciences' response to the Review Group Report Appendix 2: Schedule for Review Visit

1. Introduction and Context

Introduction

1.1 This report presents the findings of a quality review of the School of Geological Sciences, at University College Dublin. The review was undertaken in April 2011. The UCD School of Geological Sciences' response to the Review Group Report is set out in Appendix 1.

The Review Process

- 1.2 Irish Universities have collectively agreed a framework for their quality review and quality improvement systems, which is consistent with both the legislative requirements of the Universities Act 1997, and international good practice. Quality reviews are carried out in academic, administrative and support service units.
- 1.3 The purpose of periodic review is to assist the University to assure itself of the quality of each of its constituent units, and to utilise learning from this essentially developmental process in order to effect improvement, including:
 - To monitor the quality of the student experience, and of teaching and learning opportunities.
 - To monitor the quality of research activity including management of research activity and assessing the research performance with regard to productivity, income, and recruiting and supporting doctoral students.
 - To provide an opportunity for units to test the effectiveness and quality of their systems and procedures for monitoring and enhancing quality and standards.
 - To provide a framework within which the School can continue to work in the future towards quality improvement.
 - To identify shortfalls in resources and provide an externally validated case for change and/or increased resources.
 - Identify, encourage and disseminate good quality practice and to identify challenges and to address these.
 - To provide public information on the University's capacity to assure the quality and standards of its awards. The University's implementation of its quality review procedures also enables it to demonstrate how it discharges its responsibilities for assuring the quality and standards of its awards, as required by the Universities Act 1997.
- 1.4 Typically, the review model comprises four major elements:
 - Preparation of a Self-assessment Report (SAR).
 - A visit by a Review Group (RG) that includes UCD staff and external experts, both national and international. The site visit normally will take place over a two or three day period.
 - Preparation of a Review Group Report that is made public.
 - Agreement of an Action Plan for Improvement (Quality Improvement Plan) based on the RG Report's recommendations; the University will also monitor progress against the Improvement Plan.

Full details of the review process can be found on the UCD Quality Office website: <u>www.ucd.ie/quality</u>.

1.5 The composition of the Review Group for the UCD School of Geological Sciences was as follows:

- Professor Michael D. Gilchrist, UCD School of Electrical, Electronic and Mechanical Engineering (Chair).
- Dr Niamh Hardiman, UCD School of Politics and International Relations (Deputy Chair).
- Professor Mary Ford, Professor of Structural Geology and Tectonics, École Nationale Supérieure de Géologie, France.
- Professor Stephen Hesselbo, Professor of Stratigraphy, University of Oxford, UK.
- 1.6 The Review Group visited the School from 11-14 April 2011 and held meetings with School and University staff, including: UCD School of Geological Sciences academic, administrative, research and technical staff members; the Deputy College Principal, UCD College of EMPS; Head of School; representative of School teaching and learning, research, a newly appointed UCD staff member; Dean of Science; Head of UCD Buildings Office; EMPS College Finance Officer; Management Accountant, Bursar's Office; students, graduates and employers. The site visit schedule is included as Appendix 1.
- 1.7 In addition to the Self-assessment Report, the Review Group considered documentation provided by the School and the University including details of field classes across all undergraduate modules offered by the School, modules taken by postgraduates in the School as part of their Stage 1 and 2 training, Health & Safety guidelines, minutes of meetings of the School Council, Executive & Management Team, and laboratory manuals and information booklets for the Stages I, II and III modules. In addition to this School documentation, additional information was provided by the Bursar's Office on the RAM.

Preparation of the Self-assessment Report

- 1.8 The members of the SAR Coordinating Committee were:
 - Professor Frank McDermott, Associate Professor of Geochemistry, Head of School (Chair)
 - Professor Christopher Bean, Associate Professor of Geophysics
 - Dr Conrad Childs, Lecturer (Tullow Lecturer)
 - Professor Stephen Daly, Associate Professor of Petrology
 - Dr Peter Haughton, Senior Lecturer
 - Mr Tony Keogh, Chief Technical Officer
 - Dr Julian Menuge, Senior Lecturer
 - Dr Patrick Orr, Senior Lecturer
 - Miss Sarah Procter, School Administrator
 - Professor Patrick Shannon, Professor of Geology
 - Professor Ian Somerville, Associate Professor of Palaeontology
 - Professor John Walsh, Professor of Structural Geology
- 1.9 The School's Self-assessment Co-ordinating Committee was established in June 2010 and was representative of all full-time permanent staff (Academic, Technical and Administrative). The Committee met formally on six occasions, with the frequency of meetings increasing to weekly in February 2011. There were also numerous informal discussions and meetings between members of the Committee collaborating on specific areas of the Self-assessment Report. Members of staff who were not on the committee were kept abreast of developments through regular meeting with the Head of School and through the School's periodic Plenary Meetings.
- 1.10 The allocation of tasks was agreed in broad outline in July 2010, with members of the Committee taking on tasks most relevant to their areas of expertise and/or responsibility.

- 1.11 The quality review process was an item on the agenda of all Academic Staff meetings and School Plenary meetings from May 2010 through to the Site Visit. In collaboration with the School's Administrator, the Head of School produced the first draft of the Self-assessment Report (SAR), with significant input from the School Head of Teaching and Learning, the School Head of Postgraduate Studies and the Professor of Structural Geology. The School's Administrator took responsibility for the collation of information and for the production of all Appendices. As the Self-assessment Report was intended to represent the views and activities of the entire School, draft copies were circulated to all permanent full-time members of staff for comments and/or suggestions.
- 1.12 All members of the Committee contributed to the writing, editing and proof reading of the final version of the SAR and the associated appendices.

The University

- 1.13 University College Dublin (UCD) is a large and diverse university whose origin dates back to 1854. The University is situated on a large, modern campus, about 4km to the south of the centre of Dublin city.
- 1.14 The University Strategic Plan (to 2014) states that the University's Mission is: "to advance knowledge, to pursue truth and to foster learning, in an atmosphere of discovery, creativity, innovation and excellence, drawing out the best in each student, and contributing to the social, cultural and economic life of Ireland in the wider world".

The University is currently organised into 35 Schools in five Colleges;

- UCD College of Arts and Celtic Studies
- UCD College of Human Sciences
- UCD College of Life Sciences
- UCD College of Engineering, Mathematical and Physical Sciences
- UCD College of Business and Law
- 1.15 As one of the largest universities on the island of Ireland, UCD supports a broad, deep and rich academic community in Science, Engineering, Medicine, Veterinary, Arts, Celtic Studies and Human Sciences. There are currently more than 24,000 students (15,400 undergraduates, 6,900 postgraduates and 1,900 Occasional and Adult Education students) registered on University programmes, including over 4,600 international students from more than 120 countries.

UCD School of Geological Sciences

- 1.16 The UCD School of Geological Sciences is the largest of the four Irish university Schools/Departments that offer BSc degrees in Geology or closely related subjects. Prior to the major restructuring at UCD in 2005, the School (former Department) was part of the Science Faculty. Since the University restructuring, the School is located within the College of Engineering, Mathematical and Physical Sciences (EMPS). Following further refinement of UCD's academic structures in 2010/2011, the School will join the new College of Science.
- 1.17 While the move to a College of Science presents new opportunities for the development of research and teaching collaborations with colleagues in cognate scientific disciplines, important links that have been forged with colleagues in EMPS will be maintained. A good example of the

latter is the School's collaborative teaching on the Master of Engineering (ME) in Energy Systems programme that is offered by the UCD School of Electrical, Electronic and Mechanical Engineering.

- 1.18 Recent success at attracting major funding for the UCD Earth Sciences Institute (ESI) from the HEA funded PRTLI initiative, offers significant opportunity for research within the School. This involves six major thematic areas across UCD; the most relevant of these that will immediately benefit the School is "Earth Systems: Climate Change, Water & Geohazards" and it is likely that this new University institute will provide good opportunities for the School to enhace the resources that are available for research in geological sciences.
- 1.19 Research collaboration with colleagues from Engineering and Mathematical Sciences through the Complex Adaptive Systems Laboratory (CASL) are also being fostered. Similarly, the School will continue to develop involvement with the recently funded Strategic Research Cluster (SRC) on Sustainable Electrical Energy Systems led by colleagues in the UCD School of Electrical, Electronic and Mechanical Engineering.
- 1.20 The School currently offers 35 undergraduate modules. In general there are close linkages between undergraduate teaching and research. All of the School's academic staff are research active and all are involved in undergraduate teaching. All of the School's academic staff are involved in Stage 1 teaching, and virtually all staff teach on modules at all Stages (1 to 4). Most academic staff teach subjects that are closely connected with their research areas so that undergraduate students, especially in Stage 4, are exposed to the results of cutting edge research.
- 1.21 The School's strategy outlined in their 5-year School Plan envisages continued growth in both undergraduate and postgraduate FTEs. A large increase in student FTEs has been achieved within the past two years (c. 47%) which, in turn, has significantly improved the School's RAM position. Much of this impressive growth has been achieved by developing two new Level 1 General Elective modules that are open to all undergraduates in the University. These modules (GEOL10040, 'Earth, Environment and Society' and GEOL10050 'Earth and Humanity') clearly fulfill previously unsatisfied demand for undergraduate elective modules. The modules are also closely aligned with UCD's major research theme of 'Earth Sciences, Energy and the Environment' as outlined in the University's Strategic Plan to 2014, 'Forming Global Minds'.
- 1.22 Further growth in undergraduate FTEs will be achieved by seeking to attract more students to UCD who intend to pursue a BSc in Geology from the time they first enter university. This strategy is important in view of the envisaged 'flattening' of Stages 2 and 3 in the new Science programme, as the opportunities to recruit undecided Science students into Geology during Stage 2 are likely to diminish in the new structures.

2. Organisation and Management

Strengths

2.1 Relative to other Schools in UCD, there is a high satisfaction level and *esprit de corps* amongst all staff and students. This is partly due to the School having being able to retain its unique identity as an integral School in the recent restructuring from Faculties to Colleges and from Departments to Schools. The Review Group has noted the highly collegial working environment that exists in the UCD School of Geological Sciences. The principal day-to-day issues that arise in

managing and administering the School are dealt with in an informal setting in which the opendoor approach of members of staff, easy social mingling especially over coffee, and good personal relationships all clearly play an important role. These School practices have facilitated the excellent research environment, the close and supportive relationships with undergraduate and postgraduate students, and the very positive engagement of all members of the School with the range of research, teaching, and administrative tasks that arise.

- 2.2 As detailed elsewhere, the School has an outstanding research track record that places it at the forefront of its field on this island. It has been highly innovative in obtaining new sources of funding from industry as well as academic research funding sources, and it has been able to secure direct funding for a new staff position in a very difficult financial environment. The School's high-quality teaching programme ensures not only strong loyalty and appreciation on the part of the student body, but considerable employer approval for the quality of its graduates.
- 2.3 In its internal deliberative and decision-making practices, the principal meetings have until recently involved full-time academic staff, along with research staff representation. This has recently been reviewed, and revised consultative procedures for technical staff have been implemented in the School.

Challenges affecting current organisation and management systems

- 2.4 The School faces a number of challenges in the near future which will require it to establish priorities and to make strategic decisions. Existing organisation and management structures are not well suited to meeting these challenges.
- 2.5 Issues to do with staffing levels and profiles will soon become urgent. As noted elsewhere, the age profile of academic staff is quite flat, and for historical reasons it is highly genderimbalanced. The technical staff profile resembles that of the academic staff. The profile of contract research staff needs to be kept under constant review to ensure appropriate career planning and career progression. Elsewhere in this Report, it is noted that it may be timely for the School to reassess the mix of its activities, in the light of the emergent opportunities both in UCD itself and on the island of Ireland. Planning for future recruitment in all categories needs to be considered in the context of a medium- to longer-term view of School's evolution. A business case will need to be constructed for all academic and technical hires.
- 2.6 This Report also notes that there are real concerns over the condition of the buildings in which the School is located. In the light of the commendable commitment from UCD Buildings Office to prioritise refurbishment of the School's infrastructure, a detailed plan establishing a task list and estimating expenditure needs will need to be drawn up. Ongoing engagement with the Buildings Office will be required over the coming months and years.
- 2.7 It has been noted that the School's budget is often received late from the University and is always complex. Yet effective budget management will be key to building a capacity to draw up and follow through the development objectives of the School as outlined in this Report. Due to Department of Finance and Department of Education practices, the College Finance Manager and UCD Bursar's Office may not have the ability to address this problem but greater transparency and assistance in long-term and year-on-year planning would be particularly helpful. So too would complete transparency on the costs of centralised support services that are provided to this School and other schools across the University (e.g., UCD Research, Research Institutes).

- 2.8 A concern of the Review Group is that the current management and decision-making systems in the School are not optimal to meet the challenges that are now emerging. An informal and participatory means of taking decisions can be invaluable as a means of ensuring that day-to-day tasks are discharged well. But it may mean that the capacity to anticipate new challenges, to consider strategic options, and to confront hard choices, may correspondingly be weakened. A flat management structure that facilitates collegiality can make it difficult to engage effectively in strategic planning. Decisions that may require hard trade-offs, particularly if they entail changes in orientation of teaching or of the balance of staff deployment, may be difficult to broach and may therefore be postponed indefinitely.
- 2.9 Furthermore, issues that require a longer-term follow-through are likely to require a greater degree of specialised and continuous attention than is possible in the current plenary School meetings. This Report's recommendations on a number of fronts are going to require that the School engages actively with a variety of other actors across the College, among the University support staff, and with other institutions, particularly TCD.

2.10 School Executive

A new core group should be established which would have focused responsibilities and whose members would be charged with ensuring that specific longer-term planning objectives are met. This group should probably comprise: Head of School, Head of Teaching and Learning, a research group representative, a technical officer representative, and a postgraduate representative. The research representative should rotate among the six School research clusters, but not more frequently than annually. Effective consultative mechanisms between the relevant School representatives and the research and technical groups respectively should be set up.

2.11 Sub-committees to ensure specialisation and follow-through

Ensuring that key School objectives are met will require consistent attention and sustained follow-through. This will require the formation of smaller working groups within the Executive, with specific tasks and timelines for which named individuals will assume responsibility.

2.12 Leveraging additional expertise

The School needs to ensure that it has a good financial planning capacity. This will require establishing close working relationships between the College Finance Officer, the Head of School, and the School administrator.

2.13 School meetings: Academic Staff, School Council

Meetings of the School academic staff should continue, comprising academic staff, a representative from the technical staff, and representatives from among the postdocs/ research fellows, and postgraduate students. School Council plenaries should be convened not more than once a semester. This should work well as a forum for pooling information if relevant stakeholders know they also have channels for representation and consultation.

3. Staff and Facilities

Staff Profiles

3.1 Academic Staff

Despite the recommendations in the 2001 quality review, the staff profile still has a markedly flat age structure with an average age in the early 50s. In addition, the number of academic staff (10) is relatively small for a subject that is becoming increasingly broad in scope. Other institutions with similar research and teaching profile in Earth Sciences generally have a larger number of academic staff. Thus the activities of the School are highly vulnerable to retirements and migrations and the School lacks freedom to deploy staff time flexibly.

3.2 Technical Staff

The School benefits greatly from a highly skilled and dedicated technical support team. Nevertheless, the age profile of technical staff is heavily skewed towards the late 50s and all but one of the technical staff will likely retire within ten years. Technical staff have a very diverse skill set and support School activities that range from activities of general benefit to the School (e.g. rock preparation and thin section making) to the running and maintenance of specific research equipment (e.g. mass spectometry). The Review Group notes that some support is given in areas that would be unusual in other contexts (cartography for undergraduate projects) whilst other important facilities remain unsupported (general geochemistry laboratory).

3.3 Administrative Staff

The School has excellent and lean administrative support. In this regard there is a vulnerability, particularly concerning research-specific administration, which will otherwise fall to academic staff and take time away from other activities.

3.4 Research Staff

The UCD School of Geological Sciences has a particularly high proportion of Research Fellows relative to the number of academic staff. Indeed, the number of Stage I and Stage II Postdoctoral Researchers and Research Fellows is approximately three times the number of permanent academic staff, which is significantly higher than in most of the leading comparison schools of Geological Science around the world. The more senior of this cohort of contract research staff within the School are actually producing a substantial proportion of the research output of the School and are enabling the academic staff to concentrate on tutorial-style teaching of undergraduate students. While many of these Research Fellows would freely choose to lead and to undertake research permanently, in a manner that is self-financing and independent, the recent introduction of a Researcher Careers Framework across UCD will make this less feasible. Aspects of this new University policy (i.e., the Researcher Careers Framework) has the potential to damage the long-term scientific output of this School by effectively shrinking the number of established researchers within the School to those people who are permanent academic staff.

3.5 Gender Balance

Gender balance is very poor at staff level. To some extent this is historical - gender balance in the student body for geosciences has changed only relatively recently (last three decades) and there have been very few recent appointments. Nevertheless this is an important issue that should be addressed.

School Facilities

3.6 Overview

Facilities for specific research groups and for general School research are mostly good to excellent. Some facilities could be vastly improved by simple and relatively inexpensive refurbishment (e.g. to separate 'dirty' from 'clean' activities). Facilities such as rock storage, which are critical to School activities, are in a state of flux, but are at present inadequate and ultimately will need to be functioning properly.

3.7 Building Infrastructure

The single unresolved issue that was a cause for concern at the previous review is now a cause for alarm for this Review Group: this pertains to the working environment and the building in which School is housed. The Review Group notes that the previous review of 2001 recommended that new infrastructure be made available for the School as a matter of urgency and it is singularly disappointing that this has not yet been achieved. Helpful and open discussions, between the Review Group and the Head of the UCD Buildings Office, has made it clear that the new infrastructure to replace Science West is unlikely to become a reality for, at best, ten years. The ongoing and ambitious development of the Science complex, now more than 50 years old, is encouraging for the School, particularly as it is recognised that Science West is intended to be comparable in quality and scale to Science South. The new Earth Sciences Institute, which includes a large element of the School, will be located in part of Science East, which will be ready for occupation in 18-24 months time.

3.8 Isotope Geochemistry

The School now houses a state-of-the-art National Centre for Isotope Geochemistry, set up in collaboration with TCD and UCC. Recently, TCD has appointed a strategic lectureship in isotope geochemistry and a new Chair. While it is evident to the Review Group that there is strong potential synergy in the context of the TCD-UCD Alliance, it is unclear how these TCD appointments interface with the National Centre for Isotope Geochemistry.

Recommendations

- In view of the continued delay in redeveloping Science West, the Review Group strongly 3.9 recommends that an immediate plan of priorities be developed by the School, with committed financial support from the UCD Buildings Office, and planning support from the College. This should identify year-on-year improvements that can be made to increase the functionality and versatility of existing spaces (especially rooms, offices and corridors) that are used in the education of undergraduate students. The Review Group commend the UCD Buildings Office for their proactive willingness to work closely with the School in order to achieve a satisfactory working environment that will permit the School to increase its cohort of degree students. Over a four year period, with a phased budget of say €1m from the UCD Buildings Office (for example, €250-300k per annum), this plan should indicate the sequence of changes that would allow the School to reach a target number of graduating BSc Geology students in the order of 20 per annum. These expenditures should include items that would continue to be valuable in the new Science West building (e.g., movable teaching benches, overhead video projectors, etc.) as well as improvements to the workplace environment that are similar to what has been achieved in the UCD School of Biology & Environmental Science.
- 3.10 Whilst the Review Group recognises the extremely challenging financial climate that the School finds itself in, it is imperative that the School develops, reviews and articulates its plans for academic staff replacements over the short to medium term, justifying these plans in the context

of an overall academic strategic plan which should include a realistic financial case. The School should also consider how, in the long term, it will deal with the expanding scope of the geological sciences, including those aspects embodied by a small number of academic staff in cognate schools. Does the School wish to remain a relatively narrowly defined 'Geology' School, or does it wish to be seen more broadly as a School of Earth Sciences. Could the latter be achieved by developing strategic initiatives with other UCD schools?

- 3.11 Compelling evidence has been seen by the Review Group to recommend that University-wide discussions be opened immediately on the career grade for Research Fellows (not for Stage I or Stage II Postdoctoral Researchers). It is the considered opinion of the Review Group that such people should be allowed to be Principal Supervisors of PhD students in their own right.
- 3.12 The School will need to consider urgently how best to provide the necessary technical support in the short to medium term. Proposals for future technical support should be strongly linked to the overall academic strategic plan and include a business case. Effective recovery of costs from grants should be used to provide at least partial financial support for technical services in all areas of School activity. The Review Group recommends that the School undertake a thorough review of the deployment of technical staff with a view to making the best possible use of existing staff resources, maximising activities that are cost effective, and identifying areas of activity that will require technical support in the future.
- 3.13 As part of its strategic planning the School should consider how administrative resources should be best deployed to continue to provide outstanding support for its core research and teaching activities.
- 3.14 Cost recovery from grants where possible should be used as a means to ensure equipment is kept up-to-date and replaced periodically. If the School adopts an enhanced role for u/g research projects, as is recommended elsewhere in this Report, then some general School facilities will need to be significantly upgraded, especially the general geochemistry laboratory and rock preparation areas.
- 3.15 The School should continue to engage with other Irish Earth Sciences interests to develop the national facility to the maximum benefit of the University and Irish geoscience generally.
- 3.16 Chairs of appointing committees (at least) should receive training in identifying factors that affect equality at all stages in the appointment process including job description, advertisement, and interview.

4. Teaching, Learning and Assessment

Overview

4.1 The UCD School of Geological Sciences offers an excellent teaching programme ranging from general modules in Stage 1 Science through to its flagship Geology BSc degree and the two newer (running for 3 years) BSc degrees. The well conceived and well run modules in Stage 1 are very successful and attract high numbers of students, markedly improving FTE numbers. In collaboration with other UCD units, the School has developed two new entry-designated degree programmes in Geology and Archaeology and Climate and Earth Systems (now running 3 years). These pathways have small student intake numbers and thus have had a modest impact on FTE numbers. Student numbers are also small in the core geology BSc degree programme (10-12).

Undergraduate students are recruited predominantly from Ireland with only a few Erasmus and international students. The School is currently considering the viability of opening an Energy Geosciences Masters programme to an international market. If successful, this will increase student FTE numbers significantly. Distinguishing characteristics of the UCD geoscience programme are:

- Academic staff work as a coherent team to deliver high quality undergraduate education.
- A good learning environment is assured by the staff's approachability and by low undergraduate numbers. Unfortunately, the quality of the 1960's building infrastructure is a disadvantage to staff and students.
- The research activity of all staff feeds naturally into their teaching, stimulating informed criticism and creativity among the students. About 10% of graduates go on to complete PhDs, which is in line with European trends.
- Examination of students use a variety of methods including MCQs, online testing, continuous assessment, more traditional written exams and practical exams, presentations, posters and project reports. Many evaluation methods are conceived to help students learn. Students do not, as a whole, feel that they suffer from assessment or work overload, but feel that they are fairly treated and assessed. A well structured system of thorough module evaluation by students provides feedback, which is overwhelmingly positive.
- Communication between students and staff at all levels is excellent, mainly because the staff operate a relaxed and informal open door policy. The small numbers of students facilitate this system. Should they need it, students therefore have access to sympathetic mentoring and pastoral care. They also receive good and timely in-house career guidance.
- As far as our information tells us, graduate employment rates are excellent and career progression sees UCD Geology graduates taking up senior positions in Irish and international agencies and companies. Employer feedback is very positive demonstrating that at the moment there is a strong market demand for UCD geology BSc graduate.

Concerns

4.2 The Review Group found the teaching infrastructure shockingly inadequate. Teaching labs are old, inflexible and inappropriate for modern geoscience teaching, as illustrated below. The School has very poor IT facilities for teaching. Teaching facilities are at complete variance with the excellent level of teaching and research in this School. Despite being identified as an urgent problem 10 years ago in the last quality review, relatively little has been done to refurbish the aging building. These conditions represent a serious hindrance to the School's development, to the provision of an optimal learning environment, and to providing the School with facilities that would permit it to increase its number of degree level students.



The use of fixed, immovable benches, the dropping of electric sockets to benches from ceiling ducting, and the lack of proper data projector facilities are examples of issues that seriously curtail the flexibility required of teaching facilities within the School.

- 4.3 The School is at the limit of its teaching capacity as all academic staff have high teaching loads, as well as maintaining a remarkably high research output and shouldering administrative responsibilities on School, College, University, national and international levels. In addition, the broad curriculum is covered by a low number of staff compared to most geoscience departments internationally. After Stage I, there is a tradition of educating students in small class sizes using staff-intensive, tutorial-style learning methods. The teaching programme is therefore vulnerable to staff indisposition, etc. The feasibility of the proposed Masters in Energy geoscience hinges largely on the future teaching capacity of the School.
- 4.4 Teaching by doctoral students (practical work and tutorials) represents a significant component of the School's programme. Compared to European standards for doctoral students (e.g. 64 h/a in France), these doctoral students have a heavy teaching load (approx. 120 h/a).
- 4.5 The low numbers of undergraduate students in various degree pathways, especially at primary degree level, is financially problematic (Table 1). While the School has made great efforts to increase student numbers (see Section 5 on Curriculum Development) and has ambitious plans to further improve its FTE rating, its ability to achieve these targets is precarious due to restrictive teaching facilities and the use of staff-intensive teaching methods.

Table 1. Student numbers in all degree pathways in all four years.
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9c -						
	2006-	2007-	2008-	2009-	2010-	
	2007	2008	2009	2010	2011	
GEOL 10010 How the	260	263	197	218	155	
Earth Works	200	203	157	210	100	
GEOL 10020 Earth	151	162	178	162	118	

Materials					
GEOL 10030 Field Geology Level 1	38	39	37	32	22
GEOL 10040 Earth, Environment and Society				370	350
GEOL 10050 Earth and Humanity					182
TOTAL:	449	464	412	782	827

Stage 2

	2006-	2007-	2008-	2009-	2010-
	2007	2008	2009	2010	2011
GEOL 20010					
Sedimentology and	22	18	32	28	28
Palaeobiology					
GEOL 20050 Geophysics				10	7
for Archaeology				10	/
GEOL 20060 Field and	10	15	20	22	72
Structural Geology	10	15	50	22	27
GEOL 20070 Tectonics and	20	20	22	22	20
Metamorphic Rocks	20	20	55	22	28
GEOL 20080 Mineralogy	10	16	22	27	26
and Petrology	19	10	52	۷/	20
TOTAL:	79	69	127	109	116

Stage 3

	2006-	2007-	2008-	2009-	2010-
	2007	2008	2009	2010	2011
BSc Geology	12	14	10	15	7
BSc Archaeology and					E
Geology					5
BSc Climate and Earth				F	2
Systems Science				5	5
TOTAL:	12	14	10	20	15

Stage 4

	2006-	2007-	2008-	2009-	2010-
	2007	2008	2009	2010	2011
BSc Geology	6	8	6	9	13
BSc Archaeology and					
Geology					
BSc Climate and Earth					6
Systems Science					0
TOTAL:	6	8	6	9	19

In order to allow growth and improvement of geoscience education at UCD, the following actions are recommended.

- 4.6 Improve the teaching facilities urgently (see elsewhere in the Report). This must include a properly equipped IT laboratory with sufficiently powerful computers to support GIS, geophysical and numerical modelling software.
- 4.7 Reduce teaching loads of staff and doctoral students. Some suggestions are offered in the Curriculum section for reduction in the overall number of contact hours in existing teaching programmes. Other suggestions are:
 - Involve Postdocs and research fellows more in teaching.
 - Invite industrialists and specialists from semi-state bodies and various Adjunct/Visiting Staff to provide teaching in specialised domains.
 - Involve colleagues from other areas of the University in more teaching, for example, on field courses or short courses.
 - Increase class sizes in Stages III and IV to numbers that are sustainable and manageable without compromising on the quality of education.
- 4.8 Develop an integrated strategy to improve recruitment of undergraduates into geoscience degree pathways. In particular, increase modestly (to at least 20) the number of students in the flagship Geology BSc as there is a clear market for these graduates. The following are some suggestions for recruitment strategies:
 - Ask undergraduate students to return to their schools to promote geology as a degree (using a standard presentation and documentation prepared by staff). The absence of geology as a Leaving Certificate science subject is a major disadvantage as many undergraduates only 'discover' the subject by chance in Stage 1 Science. This method is used extensively in France.
 - In collaboration with the UCD School of Geography, Planning & Environmental Policy, campaign for recognition of Leaving Certificate Geography as a degree-specific entry subject for Geology and Geography degrees at UCD.
 - Consider the merits and implications of recruiting additional cohorts of students from Northern Ireland and from Britain.
- 4.9 The School may wish to explore taking responsibility for the BSc programme in Climate and Earth Systems. This degree is currently run by the UCD School of Mathematical Science and appears to have become vulnerable due to staff retirement and departure. In view of the new Earth Science Institute (ESI), and the growth of national and international concern for climate and natural resources issues, this degree is of strategic importance. Its development should be closely linked in School strategy to ESI policy in collaboration with other member Schools of the ESI.
- 4.10 Investigate the viability of a joint Geology-Geography 4 year BSc programme in collaboration with the UCD School of Geography, Planning & Environmental Policy. This degree has clear potential. Stronger ties with geography in both teaching and research could be beneficial to the School of Geological Sciences.

5. Curriculum Development and Review

- 5.1 A total of thirty-five modules (each of 5 ECTS credits, between 50 to 100 contact hours) are provided by the UCD School of Geological Sciences. Documents describing all modules are thorough and complete. An appropriate balance of lectures, practical work and fieldwork is delivered within each module. Well-written support documents are available.
- 5.2 The School maintains an important component of fieldwork in their degree programmes with all staff teaching in the field. This has not been the case for many departments across Europe due to high costs and loss of staff expertise, leading unfortunately, to an inevitable decline the quality of geoscience education. Fieldwork plays a unique and essential role in Earth Science learning. The UCD School should therefore be commended and supported in their policy of preserving it as a lynchpin in their degree courses.
- 5.3 The combination of quantitative skills with the ability to observe, analyse and interpret complex natural systems is essential in good geoscience graduates today. The UCD Geology BSc provides a solid training in core geoscience subjects, including notably, fieldwork and geophysics, which is clearly appreciated by employers.
- 5.4 Based on module titles, the curriculum design and content appears initially to be rather traditional. However, the detailed content of modules reveals that many recent fields of knowledge and competence are covered and that the curriculum is thorough. Many attractive subjects are thus 'hidden' in large modules with non-representative titles. This may mean that to prospective Stage 1 students, the quality and richness of the teaching programme is not immediately evident from documents.
- 5.5 The progressive acquisition of knowledge and competence through the degree programme is not clear. How do modules at each stage build on, and progress from, previously validated modules? In particular, learning objectives of Stage 4 are not clearly distinguishable from those of Stage 3. A lot of time is given to core geology subjects, which may be one of the reasons for heavy teaching loads for staff. Student contact hours are rather high for a university degree programme (24h per week).

Recommendations

In order to address these various points the teaching team may wish to consider the following suggestions:

- 5.6 Splitting large modules into smaller, more visible modules of say, 24 hours (approximately 1 week of teaching; 2 ECTS credits).
- 5.7 Reducing the number of student contact hours in favour of more project/personal work time.
- 5.8 Moving the main mapping project to the summer between stages 2 and 3, thus freeing up Stage 4 for an in-depth research project (e.g. 30 credits). While the quality of the mapping projects would decrease, this would provide a more structured and transparent progression in learning and competence through the four year degree programme. The degree would also become more easily comparable to British M.Sci. degrees and therefore more marketable on a European stage. This could also enhance research activity in the School and reduce teaching loads of staff.

- 5.9 Integrating more quantitative work into the degree programme such as geostatistics, geomechanics, petrophysics, for example. This would increase the quantitative skills of students, thus making them more adaptable in their careers.
- 5.10 Integrate GIS and remote sensing applications into the final stages of field mapping projects. Get necessary teaching from experts outside the School.

6. Research Activity

- 6.1 A very strong research-oriented culture pervades all levels of School activity, ranging from the undergraduate curriculum through to publication and external relations. All members of academic staff are research active and the School has a significant international reputation for research quality. The level of research income and publication impact is very high for a School of this small size.
- 6.2 Research output is across a range of Earth Sciences disciplines reflecting the expertise of the academic staff. The development of the new Earth Sciences Institute (ESI) provides a crucial opportunity to further develop collaborations across cognate disciplines.
- 6.3 The School has organised itself into six distinct research groups. The research groups operate flexibly and there are effective collaborations across group boundaries. This 'porosity' in research group boundaries is important, given the relatively small size of the School and the importance for individuals within the groups to have access to expertise and experience outside their specific area of research interest. Post-doctoral research activity has an important role in the operation of most research groups.
- 6.4 The Review Group notes and commends the very high success rate for external funding sustained over the last six years, including two Griffith Awards, numbers of SFI PI Awards, and the funding of a new academic post by the petroleum industry.
- 6.5 Publication rates per member of academic staff are high as are standard measures of citation impact (such as h-index). On the other hand, because of the relatively small number of academic staff, their age and experience and commitment to fund-raising, and the consequent large number of post-doctoral researchers, first-author publications by academic staff are less frequent. Although there is a danger that this position might be regarded as frustrating for academic staff, and therefore a risk with respect to staff mobility, this does not appear to be the case in the UCD School of Geological Sciences.
- 6.6 The School supports a large number of postgraduate students at doctoral level per academic staff member. Since the previous quality review procedures for monitoring the progression of graduate students and engaging them in the board activities of the School have been markedly improved and at the same time the rates of completion have improved significantly. The Review Group notes that the large number of doctoral level students and their structured programmes provides a significant boost to the overall research-centred ethos of the School.

- 6.7 In attempting to meet requirements for increased student numbers it is important that the School preserves the excellent research-centred ethos. Thus any reforms to the undergraduate curriculum and introduction of new courses should always be mindful of the potential benefit to the research effort of the School, for example through the development of undergraduate research projects as a means to increase the visibility of research at bachelor-degree level, to provide training in research techniques, and to ensure efficient use of academic and research staff time.
- 6.8 The School should pursue vigorously the opportunities for developing research initiatives afforded by the ESI, including outward-looking collaborations (e.g. with the Geological Survey of Ireland and policy-making bodies).
- 6.9 The School should continue to view research groups as somewhat fluid entities, constructed around shared facilities and interests, but open to future developments and collaborations.
- 6.10 The School should continue to support the individual research aspirations of the academic staff. To some extent this might be achieved by encouragement of sabbatical leave, and development of more flexible ways of delivery of teaching, by post-doctoral researchers for example, in order that academic staff time may be more effectively concentrated on different tasks at specific times in the University calendar.

7. Management of Quality and Enhancement

- 7.1 The School's current means of monitoring student progress, managing staff-student liaison, seeking and responding to feedback from students, work well. They ensure high-quality programme delivery, and very small programme numbers make close personal contacts the norm between staff and senior undergraduate as well as postgraduate students.
- 7.2 Review of the curriculum is currently under way but awareness of changing practices in other universities may not be as extensive as it could be. Programmes in Geological Sciences are being repositioned and modernised quite extensively in analogous universities. As noted elsewhere in this Report, concerns about over-teaching are relevant not only for potential student overload but also for efficient use of staff resources.
- 7.3 The management of quality enhancement displays the same deficits as noted in Section 2 in relation to strategic capacity, forward planning, and ongoing systems for monitoring and ensuring delivery of complex objectives over the medium to longer term.
- 7.4 Other sections of this Report have noted a variety of strategic decisions facing the School, where current practices are not optimal and the current capacity for assessing alternatives is not well developed. Among the problematic areas bearing upon quality enhancement are the following:
 - The School needs to evaluate the range of options for addressing its RAM deficit (for example prioritising Masters or undergraduate numbers).
 - The School needs to develop a timetable for planned academic staff replacement, and the research and teaching areas to be prioritised.

- The School needs to consider the extent and nature of technical staff supports required in a changing teaching and research environment, and whether personnel redeployment may be desirable.
- The School needs to further explore new income generation possibilities, including commercialisation options to support new contract technical staff support.

7.5 The School should implement the detailed management restructuring recommendations in Section 2 above.

8. Support Services

Strengths

- 8.1 The School is fortunate in having excellent administrative support. The School administrator's commitment to the job goes way beyond the call of duty. This has included a willingness to design individually optimised timetables for demonstrators and even for senior undergraduate students, and at times extends to providing emergency accommodation to new overseas research students.
- 8.2 The School also benefits from excellent research administration support, funded by research income and providing a general support to the research activities of the whole School. The very high level of support staff commitment within the School clearly facilitates good information flow.

Challenges

- 8.3 The current School administrator's supererogatory commitment is what makes the School function so well, and the School is indeed fortunate to have a person of such energy, resourcefulness, and good humour at its hub. But the extent of its reliance on these extraordinary personal qualities also suggests a systems problem. Many of the deficits in organisational supports seem to originate in the inadequate functioning of wider University support services.
- 8.4 The School's research administrator, who was appointed to meet perceived deficits in University supports for research projects, is funded from a research project, thus taking revenue from research activity. It would be significantly helpful to the School if a proportion of the research overheads that are associated with its research activities could be used to employ a designated research administrator within the School.

Recommendations

8.5 Deficits in UCD's centralised support services need to be addressed as a matter of urgency. These problems are not exclusive to the UCD School of Geological Sciences. The characteristics of those wider University functions that work well appear to be "customer-focused" or "school-centric" (Library; HR Partner). Units that are the cause of specific problems include Fees & Grants; Pre-Award; Post-Award; UCD Bursar's Office; UCD Research. The University and the new College of

Science should prioritise the quality of their service provision by being more customer focused. Among the issues that require attention are the following:

- There are persistent delays in the supports required at School level from UCD Fees and Grants Office, especially for incoming non-EU PhD students who have a number of distinctive start-up requirements. This is a recurring issue with a highly foreseeable group, and yet it seems to occasion constant problems.
- The centralised aspects of UCD Human Resources is perceived as being unduly slow to respond to recurrent needs to set up or amend contracts for research staff.
- The support for project management available from research overheads is inadequate. In a School with a large research staff complement, this creates an additional heavy administrative burden for the School.
- UCD Finance Office's approach to the School's budget results in an ongoing lack of clarity, and there are persistent difficulties over invoice management, where incorrect billing requires constant School vigilance and over which transparency is often lacking.

This Report recommends that the University should take heed of these concerns in its own quality review practices.

- 8.6 Some of the issues associated with the design of School systems may be amenable to management at School level. The surges of administrative requirements, which can at times overwhelm the School administrator and the research administrator could be relieved through more anticipatory planning and a more consistent approach to designing School systems that do not require extraordinary personal sacrifices from School support staff.
- 8.7 The School should aim to improve its strategic capacity to engage in effective liaison with College and University offices, to mobilise assistance and leverage resources from elsewhere in the College and the University, and to assist the School in advancing its strategic priorities in the medium to longer term.
- 8.8 Among the Officers of College and University with whom the School needs to develop stronger ongoing relationships are the following:
 - The College Finance Officer, who needs to be more actively engaged in supporting the Head of School, the School Executive, and the School administrator in understanding and managing the School budget.
 - The Principal of the College, who needs to be fully apprised of developments in the School's strategic deliberations, strategic priorities, resource supports required, and problems arising from engagement with the University administrative offices.
 - UCD Buildings Office, intensive engagement with which will be vital to drive through the extensive refurbishment of the School infrastructure which the School so manifestly needs as a matter of urgency.
 - IT Services, to ensure that they are fully aware of the specific complex requirements of the School, so they too can plan in advance to meet the School's needs.

The changes to the organisation of the School's management and decision-making structures outlined in Section 2 should be implemented with these objectives in mind.

9. External Relations

- 9.1 The School has excellent connections with indigenous and international exploration industries in earth sciences, including those of petroleum and mining. The quality of these relationships is evident in the fact that most of the BSc graduates from the School are employed directly by industry immediately after graduation. This is in contrast to other universities around the world, where it is more common for employers to recruit Masters level geology graduates.
- 9.2 The quality of the postgraduate education provided by the School is also excellent and the various MSc and PhD graduates of the School invariably progress to have successful careers in research and industry across the world.
- 9.3 The School has a strong complement of Adjunct staff and Visiting staff, at both researcher, lecturer and professor levels. These staff tend to be associated with leading industry groups, research organisations and international universities. These relationships have been developed over many years and are mutually beneficial to all concerned. In some instances, these external staff deliver specialist focussed courses that are offered to students of the School.
- 9.4 In one specific instance, the connection with international industry is so significant that industry has funded a rolling 3-year lectureship (Tullow Oil). While this is relatively common in other countries, it is rare within UCD; this is an exemplary funding model that other schools within the university may wish to follow in years to come.
- 9.5 The staff of the School provide strong professional leadership in certain areas. Notably, the School is home to the state-of-the-art National Centre for Isotope Geochemistry; this is in collaboration with both TCD and UCC.

10. Summary of Commendations and Recommendations

Commendations

- 10.1 The School has an outstanding track record in research that places it at the forefront of its field on this island and comparable in quality to many of Europe's leading universities. This research-oriented culture pervades all levels of School activity, ranging from the undergraduate curriculum through to publication and external relations. All members of academic staff are research active and the School has a significant international reputation for research quality. Within UCD, the strategic development of the new Earth Sciences Institute (ESI) provides a crucial opportunity to further develop collaborations across cognate disciplines.
- 10.2 The School has been highly innovative in obtaining new sources of funding from industry as well as various research agencies. The Review Group notes and commends the very high success rate for external funding sustained over the last six years, including two Griffith Awards, numbers of SFI PI Awards, the number and calibre of senior Postdoctoral staff, and particularly the funding of a new academic post by the petroleum industry in a very difficult financial environment.
- 10.3 Graduate employment rates are excellent and career progression sees UCD Geology graduates taking up senior positions in Irish and international agencies and companies. Employer feedback is very positive demonstrating that there continues to be a strong market demand for UCD geology BSc graduates. This demand is compatible with the intention of the School to increase its number of degree level geology students to a target of 20 per annum.

- 10.4 The School's high-quality teaching programme ensures not only strong loyalty and appreciation on the part of the student body, but considerable employer approval for the quality of its graduates. The School offers an excellent teaching programme ranging from general modules in Stage 1 Science through to its flagship Geology BSc degree. The well-conceived and well run modules in Stage 1 are very successful and attract high numbers of students, markedly improving FTE ratings. In collaboration with other UCD schools, two new entry-designated degree programmes in Geology and Archaeology and Climate and Earth Systems have been developed and in existence for three and four years, respectively.
- 10.5 The School maintains an important component of fieldwork in its degree programmes, with all staff teaching in the field. This has not been the case for many departments across Europe due to high costs and loss of staff expertise, leading unfortunately to an inevitable decline the quality of geoscience education. Fieldwork plays a unique and essential role in Earth Science learning. The UCD School should therefore be commended and supported in their policy of preserving it as a lynchpin in their degree courses.
- 10.6 The School benefits greatly from a highly skilled and dedicated technical support team. Technical staff have a very diverse skill set and support School activities ranging from those of general benefit (e.g. rock preparation and thin section making) to the running and maintenance of specific research equipment (e.g. mass spectometry).
- 10.7 The School is fortunate in having excellent administrative support. The School administrator's commitment to the job goes way beyond the call of duty. The additional research administrator, who is funded by research income and not by the overheads associated with research income, is equally excellent and invaluable to the School.
- 10.8 The School is now home to the state-of-the-art National Centre for Isotope Geochemistry, which was established in collaboration with TCD and UCC.
- 10.9 The Review Group commends the UCD Buildings Office for their proactive willingness to work closely with the School in order to achieve a satisfactory working environment that will permit the School to increase its cohort of Bachelors and Masters degree students. This important development will be crucial to the School in the coming decade while the Science West building is being developed.

- 10.10 A strategic planning group should be established within the School with focused responsibilities and whose members would be charged with ensuring that specific longer-term planning objectives are defined and met. This group should probably comprise: Head of School, Head of Teaching and Learning, a research group representative, a technical officer representative, and a postgraduate representative. The research representative should rotate among the six School research clusters, but not more frequently than annually. Effective consultative mechanisms between the relevant School representatives and the research and technical groups respectively should be set up.
- 10.11 In attempting to meet requirements for increased student numbers it is important that the School preserves the excellent research-centred ethos. Thus, any reforms to the undergraduate curriculum and introduction of new courses should be mindful of the potential benefit to the research effort of the School, for example through the development of fourth year undergraduate

research projects as a means to increase the visibility of research at bachelor-degree level, to provide training in research techniques, and to ensure efficient use of academic and research staff time.

- 10.12 Since the redevelopment of Science West will not be completed for the next decade, the Review Group strongly recommends that an immediate plan of priorities be developed by the School, with committed financial and planning support from the UCD Buildings Office, as well as the new College of Science and the University. This should identify year-on-year improvements that can be made to increase the functionality and versatility of existing spaces (rooms, laboratories, offices and corridors) that are used in the education of undergraduate students. Over a four year period, with a phased budget of say €1m from the UCD Buildings Office (for example, €250-300k per annum), this plan should indicate the sequence of changes that would allow the School to reach a target number of graduating BSc geology students of 20 per annum. These expenditures should include items that would continue to be valuable in the new Science West building. The most visible public office within the School, namely that of the School Administrator, should also be improved in its general appearance and ambience.
- 10.13 As a matter of urgency, the School should develop its plans for academic and technical staff replacements over the medium to long term, justifying these plans in the context of an overall development plan which should include a realistic financial case. The School should also consider how it will deal with the expanding scope of the geological sciences, including those aspects embodied by a small number of academic staff in cognate schools and associated with the newly established Earth Sciences Institute.
- 10.14 The Review Group specifically recommends that University-wide discussions be initiated on the career grade for Research Fellows (not Stage I or Stage II Postdoctoral Researchers). It is the considered opinion of the Review Group that such people should be allowed to be Principal Supervisors of PhD students in their own right, similar to Adjunct and Visiting staff across the university. Such people should be allowed to develop independent research careers within the university, provided that their non-exchequer funding streams remain adequate.
- 10.15 The School may wish to explore taking responsibility for the BSc programme in Climate and Earth Systems. This degree is currently run by the UCD School of Mathematical Science and appears to have become vulnerable due to staff retirement and departure. In view of the new Earth Sciences Institute (ESI), and the growth of national and international concern for climate and natural resources issues, this degree is of strategic importance. Its development should be closely linked in School strategy to ESI policy, in collaboration with other member Schools of the ESI. Similarly, the School should investigate the viability of a joint Geology-Geography 4 year BSc programme in collaboration with the School of Geography. This degree has clear potential. Strong ties with geography in both teaching and research could be beneficial to the School of Geological Sciences.

Appendix 1

UCD School of Geological Sciences' Response to the Review Group Report

The UCD School of Geological Sciences welcomes the positive and constructive tone of the Quality Review Report. The Report's recommendations will greatly assist with several aspects of the School's strategic planning in the future. The School looks forward to working with other units within UCD to implement several of the key recommendations, in particular to improve the physical infrastructure of the building that houses the School. The School thanks the Review Group for their thorough review, and for the professional manner in which they completed their work.

Finally, the School's Quality Review committee wishes to extend its thanks to the School's staff and students for their enthusiastic cooperation at all stages of the review process. The help and cooperation of various external agencies and employers with aspects of the review is also gratefully acknowledged.

APPENDIX 2



Quality Review Timetable UCD School of Geological Sciences

Monday, 11 April 2011: Pre-Visit Briefing Prior to Site Visit

- 17.30-19.00 RG <u>only</u> meet at hotel to review preliminary issues and to confirm work schedule and assignment of tasks for the following three days.
- 19.30 Dinner hosted for the Review Group, Radisson Hotel

Day 1: Tuesday, 12 April 2011 Venue: Room G17, Science West

09.00-09.30	Private planning meeting of Review Group
09.35-10.15	RG meet Unit Senior Management Team (All Academic Staff of the School)
10.30-11.30	RG meet Group representative of Teaching and Learning; Assessment; Curriculum Review; and Quality Enhancement
11.30-11.50	Break - Review Group only
11.55-13.00	RG meet Group representative of Research and Scholarship (All Academic Staff, Senior Research Fellows and representatives of post-doctoral researchers in Room G01)
13.15-14.15	Working lunch – RG meet with representative group of students 13.15-13.45 Meeting with Undergraduate Class Reps 13.45-14.14 Meeting with Post-graduate Reps
14.15-15.00	Private meeting of Review Group – reflect on earlier meetings and examine documentation supplied for site visit
15.00-15.45	RG meet with representative group of administrative/technical/support staff as appropriate 15.00-15.20 Meeting with School Administrator and Geophysics Group Research Administrator 15.20-15.45 Meeting with five School Technical Staff.

15.45-16.00 Tea/coffee break

16.00-17.00 RG meet with	individual staff –	10 minute sessions
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- 17.00-17.45 Meeting of Review Group to identify remaining aspects to be clarified/explored and to finalise tasks for the following day
- 17.45 RG Depart

Day 2: Wednesday, 13 April 2011 Venue: Room G17, Science West

08.30-09.30 RG meet with UCD Dean of Science 09.30-9.55 RG meet with Deputy College Principal Tour of facilities 10.00-10.40 10.40-11.00 Tea/Coffee break 11.00-11.30 RG meet Head of UCD Buildings Office 11.30-11.45 RG meet with UCD College of EMPS Finance Officer 11.45-12.30 RG meet with Management Accountant, UCD Bursar's Office 12.30-13.30 Working lunch – Review Group RG meet with recent graduates and employers separately parallel meetings RG sub-group meet with employers (representatives from the Geological Survey of Ireland and Tullow Oil plc) RG sub-group meet with recent graduates 13.30-14.00 Private meeting of Review Group 14.00-15.00 RG meet with recently appointed staff 15.00-15.20 Tea/Coffee break 15.20-17.00 Review Group meet to prepare first draft of Review Group Report 17.00 - 18.00RG Depart and break for an hour 18.00-22.00 Review Group reconvenes in Hotel and, following working dinner, continues to prepare School presentation and first draft of Review Group Report identifying points for (i) commendation and (ii) recommendations for improvement

Day 3: Thursday, 14 April 2011 Venue: Room G17, Science West Building

8.30-9.00 Informal meeting between Review Group and Head of School to feedback outline strengths and areas for improvement and/or any confidential observations.

- 9.00-9.30 Private Meeting of Review Group
- 9.30-10.00 Exit presentation to all available staff of the unit to be made by the Chair or an external Review Group member as agreed, summarising the key findings of the Review Group
- 10.00-12.30 Review Group work on draft of report
- 12.30-13.30 Lunch
- 13.30-15.30 Review Group finalise first draft of Review Group Report
- 15.30 Review Group depart