

Research Accreditation Outcomes

Limerick Institute of Technology

May 2005

FOREWORD

This publication contains a HETAC report on the findings of a panel engaged to evaluate an application by Limerick Institute of Technology at Master's level in Control Systems and Renewable Energy Systems.

The relevant HETAC policy and criteria are presented in the documents entitled 'Taught and Research Programme Accreditation Policy, Criteria and Processes (2005)' and 'Validation process, policy and criteria for the accreditation of providers to maintain a register for a specified research degree in a specified discipline area (2003).'

To accredit an institution to maintain a research degree register HETAC must be confident that the institution has the capacity for the oversight and support of research degree programmes in general and has specific capacity in the relevant discipline areas. The accreditation process seeks evidence of an active, supportive academic environment and research community in the discipline areas identified as demonstrated by traditional research performance indicators. Accreditation may be granted at Master's level or at Doctoral level.

Research accreditation is available to academic departments and schools or to multi-disciplinary research groups that can demonstrate the capacity to offer postgraduate research degree programmes to an acceptable standard. It is also available to inter-institutional groups.

Normally, institutions seeking research accreditation will have previously been approved to submit individual research degree programmes to HETAC for validation on a case-by-case basis and in this way will have established a track record in the education of research students.

Research accreditation affords significantly greater independence from HETAC and is a prerequisite for an Institute of Technology to receive delegated authority from HETAC to make its own research degree awards. Accreditation is subject to periodic evaluation and to review at any time.

The accreditation process, which is rigorous but non invasive, includes a self-evaluation by the higher education institution and an external evaluation (including a site visit) by a panel of recognised experts engaged by HETAC. The process contributes towards the enhancement of the quality of the institution's research degree programmes.

Comhairle na nDámhachtainí Ardoideachais agus Oiliúna
The Higher Education and Training Awards Council

DRAFT Report of the findings of the evaluation panel engaged to consider the application by Limerick Institute of Technology for accreditation to maintain postgraduate research degree registers at masters level in Control Systems and Renewable Energy Systems.

20 May 2005

Assessors: Juergen Ackermann, Peter Cook, Paul Curran, Jim Gosling, Gareth Harrison, Anthony Holohan, Rachel O'Toole ¹

¹ Affiliations are set out in Appendix A.

1 INTRODUCTION

On 7 February 2004 Limerick Institute of Technology submitted an application to HETAC for accreditation to maintain a register of postgraduate research degrees at masters level in Control Systems and Renewable Energy Systems.

Accreditation to maintain a register allows an institution to register postgraduate research degree students without referring the details of the individual research degree programme to HETAC for validation decision on a case-by-case basis.

Such accreditation is now a prerequisite for an Institute of Technology to apply for delegated authority from HETAC to make its own research degree awards.

A panel chaired by Professor Jim Gosling was assembled by HETAC to evaluate the case for accreditation. Details of the panel are set out in Appendix A. The site visit took place between 09:00 and approximately 15:30 on 21 April 2005 at the Limerick Institute of Technology. The panel met with the senior management, research staff and graduate students and viewed relevant facilities.

2 SUMMARY OF FINDINGS

The Institute will be able to meet with the criteria for institutional accreditation to maintain a masters level register of postgraduate research degree students.

It is recommended that Limerick Institute of Technology be accredited to maintain a register of postgraduate degrees at *masters level* (level 9)

*in the areas in **Control Systems and Renewable Energy Systems** reflecting the expertise of the current research-active academic staff* subject to the standard conditions and

- 1) The Institute should replace the discipline area descriptor *Control Systems and Renewable Energy Systems* with one that more accurately reflects the research capacity.
- 2) The Institute should produce a response detailing how it will address the other issues raised by the assessors.
- 3) The Institute should revise and update its regulations, procedures (including learner assessment procedures in line with the 2004 HETAC Standards), submit these to HETAC and obtain its agreement.

3 RESEARCH ENVIRONMENT (APPENDIX B): CONTROL SYSTEMS AND RENEWABLE ENERGY SYSTEMS

Discipline area descriptor

The range of activity covered by union of the areas 'Control Systems²' and 'Renewable Energy Systems' is very large and beyond the capabilities of the group.

² A control system typically comprises five components 1) a plant (with problems of modelling and identification including the uncertainty in plant parameters), 2) actuators, 3) sensors, 4) a control algorithm — the design of this algorithm for the feedback and feed-forward interconnection of elements 1 to 4 is the core of Control Systems, it is where specifications for stability, robustness with respect to the uncertain plant parameters, precision and energy consumption of the closed-loop control system etc. must be brought into balance—, and 5) the hard- and software implementation of the control algorithm in a controller. The experience of the research staff is limited to (3) and (5).

The group's 'control systems' research relates to implementation, software generation, power electronics, sensors, and networking aspects therefore use of a term like "Applied Control" or "Control System Implementation" or such like, would be a lot more accurate.

Therefore, it is recommended that Institute adopt a title that more accurately reflects the group's experience and realistic ambitions (e.g. controller implementation or a formulation that starts from the intersection of the two large areas rather than their union).

The remainder of the report relates to this limited scope activity.

Note the findings are reported against the HETAC criteria. Some strengths/areas for improvement impact on more than one criteria and are therefore repeated.

Is there an active, supportive academic environment and research community in the subject or discipline area for which accreditation is sought demonstrated by traditional research performance indicators?

Strengths

The two academic staff together with their research students comprise an active, energetic and competent research group at masters degree level.

The research staff are committed, capable, suitably qualified, have impressive track records in industry, and have been actively involved in masters level research for approximately five years.

The group is extremely fortunate in its students: they are mature and able.

The projects completed are of good to high quality.

The group has very strong and fruitful links with industry. This has considerable benefits for research, but also for education at sub-masters levels.

The environment is friendly. In the words of one assessor: 'everyone on first name terms established marked difference in tone to my own institution'.

Areas for improvement

The group is moving in the direction of critical mass although the appointment of an additional staff member would be of significant benefit in this respect.

The research group has produced no journal papers nor has it attempted to do so. Most of the group's conference papers were at conferences located in Ireland, although some of these were international.

The group is perhaps not as well informed about international research as it could be.

Some of the projects are very applied. Accordingly, while well executed, not all of the projects would fall within all definitions of research.

Is there evidence of academic guidance, authority and leadership?

Strengths

The industrial and project-based experience of leading research staff is extensive and unquestionably adequate for the applied research/development undertaken.

Graduated M.Sc. students appear to have gained from the programme.

Areas for improvement

This particular area of research would benefit by the addition of a senior researcher.
Most traditional research performance indicators are lacking.

Are there procedures for the planning and monitoring of postgraduate programmes of research within the discipline area?

Strengths

The dynamic of the relationship between the research staff and the students in this group appears to be excellent. In the words of one assessor: 'considerably better than many supposedly prestigious institutions that I have visited.' One hopes that the group will be able to maintain this dynamic as it grows.

The procedures are well defined and projects appear well planned and executed.

Is there specialised training dictated by the discipline and the nature of the research being undertaken?

Strengths

Some relevant training is available with partner companies and other organisations.

Areas for improvement

Training is provided mainly through project supervision. The size of the research group raises issues in this regard. In house expertise cannot cover all relevant topics. With growth this situation could improve, provided resources are directed to nurture such growth. Heightened collaboration with other research groups is essential.

Are there staff who:

- are willing to lead research programmes?
- are sufficiently qualified to the level of the programmes of research for which accreditation is being sought?
- have prior experience in the supervision of research students to successful completion?
- are engaged in research, advanced study and other activities relating to practice in the subject or discipline area concerned?

Strengths

There are two research staff who are willing and able to lead research programmes at masters degree level in certain fields. Their industrial experience is relevant and complementary.

The list of successful masters graduated demonstrates capacity.

Conference publications in each area are a good indicator of activity.

Areas for improvement

The group should start attempting to publish in peer-reviewed international journals.

It would be desirable for academic staff to enhance their own qualifications, e.g., to PhD, and also for further staff to be appointed.

Are there adequate physical resources as well as technical and administrative support structures and attendant staff appropriate to the research being undertaken?

Strengths

The computing, technical and workshop facilities appear good.

Areas for improvement

Library stocks are inadequate in this field — detailed comments are presented at the end of this section. There is a heavy (perhaps over-) reliance on the University of Limerick to supply *essential* information/library resources to the research students.

The research laboratories are drab particularly in comparison to the administrative offices.

Are there seminars, both focused and interdisciplinary, to facilitate the dissemination and exchange of the fruits of research, enabling peer review and quality assessment?

Strengths

Seminars are of two types. (i) Academic, where the content is technical engineering. (ii) Contextual, where the content deals with appropriate procedures and regulations, how to write an academic paper, what paper reviewers look for, how to organize a research program, etc..

The links with UL are promising and are a good way of boosting activity with minimal effort.

Interdisciplinary discussions take place on an informal basis.

Areas for improvement

The seminar programme is limited and should be extended.

Students need to attend international conferences and meet their peers from other countries.

Links with UL are clearly useful, but the Institute as a whole and this research group in particular will need to broaden its vision if it intends to play a significant role in research, which is a truly international venture.

Given limited expertise within the research group, owing to its size, students probably need to interact significantly with the broader Institute and beyond.

Are there opportunities for interaction with other postgraduate research candidates and their supervisors, both within and outside the institution and opportunities, where appropriate, for collaboration with other providers of higher education, industry and commerce and the public sector etc.?

There is room for improvement here.

Are there procedures for the implementation of quality assurance within the schools / departments concerned?

Strengths

The processes currently in place are adequate for the current scale of research in the department however more formal procedures may be required as the department grows.

The list of external examiners used is reasonable.

Areas for improvement

One external examiner is a collaborator on two publications with the joint leader of the academic team.

Library facilities

The primary submission documentation makes scarcely any mention of the library.

The library's post-bachelor facilities are insufficient for research in the area of this specific application.

Each active research area needs three things: (i) a backbone collection of books, perhaps 20 to 100; (ii) access to core journals, either paper or electronic format and (iii) access to journal search and indexing systems. There is no hint of measures or policy on this issue in the submission documentation. No evidence of such measures or policies on this issue came to the attention of the panel during the site visit (or indeed the visit of one of the panel members to the library which was part of the overall site visit). Indeed, there seemed to be little management or faculty awareness of such issues.

Strengths:

The library staff are extremely helpful, committed and competent.

The library is suitable and adequate for an undergraduate institution with student numbers of between 1000 and 2000 and is heavily used.

Areas for improvement

There is a lack of availability, either hardcopy or electronically, of access to relevant scholarly journals. This is partly mitigated by access to the Library in UL.

There is a lack of a suitable journal indexing system. Although science is catered for, as well as the humanities, there is no access at all in the general area of Electrical and Electronic Engineering, Computing, and Information Technology. When an institution does not have good access to journals, it is especially important to have access to appropriate journal indexing systems. In the area of research under consideration here, the only access that researchers have to journal indexing services is through UL.

The book collection is poor and this is only partly mitigated through the inter library loan facility. This is comparatively expensive, and introduces a delay of several days and the UL library. The availability, on home campus, of core-specialised textbooks, would greatly assist in breaking-in new researchers.

Reliance on UL's library is not entirely satisfactory, for the following reasons.

1. If a researcher in UL wishes to obtain a particular journal paper, it can be done in minutes. The same exercise for a researcher in LIT involves a journey to UL and takes over two hours.

2. Postgraduate research is a very specialised activity. Even in the area of Control Systems and Renewable Energy Systems, books which service UL's research in this area may be of little or no use to LIT's research in this area. Their respective sub-areas of interest might overlap little if at all.

3. Postgraduate research involves spending many hours finding and studying related research carried out by other researchers. This requires access to journal indexing systems. Access via UL is useful, but it greatly increases the time required, and in practice must result in a significant reduction in quality as regards this specific issue.

4 COMMENTS RELATING TO GENERAL CRITERIA (APPENDIX A) INSTITUTIONSL LEVEL

The Institute has targeted five niche research areas, one being the area of Control Systems and Renewable Energy Systems. The comments here relate to the latter.

Regulations and code of good practice:

The Institute should thoroughly revise its regulations (last edition October 2001!) and code of practice taking into account the HETAC accreditation criteria and ensure that procedures distinguish between accredited areas and those that are not.

Before accreditation is granted the Institute should agree its regulations and code with HETAC.

Research Performance Indicators:

The institute needs to pay more attention to most of the traditional performance indicators.

Intellectual Property:

A policy is in place. The institute should review its measures for raising awareness of the issues among staff and students.

Research administration and Quality assurance:

An effective quality assurance system involves a closed loop.

There are no feedback mechanisms for ensuring that the experience of research students is assessed and used for the purpose of quality improvement.

Research leadership and motivation:

The Institute appears somewhat constrained in supporting research. Staff involved in research appear to have few external incentives (*e.g.* pay and promotion). With few incentives the majority of staff may be expected to remain research inactive. Accordingly, growing research will require a hiring policy which favours research active applicants. Senior staff observed that teaching remains a primary concern in recruitment of new staff. Accordingly, one must conclude that actual (as distinct from moral) support for research groups by senior management is not strong. The growth of research groups, it seems, will depend largely on the good will and hard work of a relatively small cohort of research active staff.

Monitoring research Progress:

No major concerns.

Equality of opportunity:

No major concerns.

Feedback, complaints and appeals:

The institute should establish/review formal communication links between postgraduate students and the institute's administration (as distinct from its faculty members).

Information Research Studies Programme:

More visibility needed

Access to research degree programmes:

No major concerns.

Transfer between the Doctoral and Master's Registers:

The institutional transfer procedures are not in line with HETAC guidelines. While not critical for masters level of accreditation the matter should be addressed.

Given that the Institute has not currently got the capacity to supervise to doctoral level in this field it is important that arrangements are put in place to enable masters research student who are very talented to transfer to a PhD programme in another institution.

Direction, supervision, support and training of students:

The induction offered to students should be broadened. This was an area flagged by students.

It is recommended that the Institute make provision for mandatory generic training for research students in the context of the Schools of Engineering and Science.

It is recommended that the Institute invest in better library/information facilities for research students.

Supervisor training and support:

No major concerns.

Postgraduate research degree: Assessment of the student:

The assessment procedures and criteria need to be updated to comply with the new HETAC standards and guidelines.

APPENDIX A. THE PANEL OF ASSESSORS

A.1. Declarations relating to conflicts of interest

All assessors were required to consider whether or not there might be a conflict of interest involved in acting. No issues of significance were reported.

A.2. The panel

Professor Juergen Ackermann, Institute of Robotics & Mechatronics, Oberpfaffenhofen, Germany

Dr Peter Cook, School of Electrical Electronic Engineering, The University of Manchester

Dr Paul Curran, Dept of Electronic and Electrical Engineering, University College Dublin

Professor Jim Gosling, The Quality Office, National University of Ireland Galway (***Chairperson of Panel***)

Dr Gareth Harrison, School of Engineering and Electronics, The University of Edinburgh

Dr Anthony Holohan, School of Electronic Engineering, Dublin City University

Ms Rachel O'Toole, Ericsson Research and Development

With

Dr Peter Cullen, HETAC, in attendance.