



Institute of Technology Sligo
INSTITIÚID TEICNEOLAÍOCHTA SLIGEACH

PROGRAMME VALIDATION REPORT

DATE OF EVALUATION 18th May 2016

PROGRAMME EVALUATED

SG_EPREC_K08 BEng in Precision Engineering & Design L8 Add-on
SG_EPREC_C06 HC in Engineering in Precision Engineering & Design L6
SG_EVALI_S06 Certificate in Validation Technologies SPA L6

Panel of Assessors

Mr Tom Cullivan,
(Chairperson)

Retired HETAC Secretary,
Knockavaddy,
Furbo,
Spiddal,
Co Galway
Email: farwestern@eircom.ie

Dr Trevor Cadden

Ulster University
Department of Management & Leadership
Shore Road
Newtownabbey
Co Antrim
BT37 0QB
t.cadden@ulster.ac.uk

Dr. Brian Corcoran

Associate Dean of Education
Faculty of Engineering and Computing
Dublin City University
Dublin 9
Email: Brian.Corcoran@dcu.ie

Mr. Ciaran Garry

Manufacturing Manager
Operations Dept.
Abbott Diagnostic Division,
Finisklin Business Park,
Sligo,
Ireland, F91 VY44

Email: Ciaran.Garry@abbott.com

Mr Jonathan Read Executive Director of Technology
LINDAL Group Holding GmbH
St. Annenufer 2
20457 Hamburg
Germany
Email: Jonathan.Read@lindalgroup.com

Mr. Tony Curran Global Mould and Tooling Expert
Email: tony.curran@delphi.com

Ms. Annica Rasmark Acting Education Development and Quality Manager,
Institute of Technology Sligo,
Ash Lane,
Sligo.
Email: rasmark.annica@itsligo.ie

Declaration regarding any conflicts of interest:

The members of the Panel signed a form confirming that they did not have any conflict of interest.

Meeting with School Management

Attendees:

Head of School: Shane Fanning

Head of Department: Una Parsons

Registrar: Colin McLean

Programme Coordinators: Michael Moffatt, Sean Dalton, Mary Nolan, Fiona O'Donovan

The Chair welcomed the school management team and introduced the panel. Head of School and Head of the Department made a short presentation.

The panel started with a discussion on the L6 Certificate in Validation asking if P&ID (Piping and Instrumentation Diagram) were included in any modules in the Certificate. The Programme coordinator responded that it was covered in the GMP module where preventative maintenance was also covered.

The Programme Coordinator clarified that there had been considerable consultation with industry and the certificate would meet the skills sets needed to develop validation technicians at entry level and that employers were in favour of upskilling current staff due to shortages of validation technicians and engineers. The GMP module runs already on several programmes and is assessed by continuous assessments and final exam. The students have one visit to the Institute when they are able to engage in more practical

training. The panel queried how this day was utilised. Staff explained that it was divided up by half day metrology area practising in labs and performing calibrations, and half a day was workshop based around subjects such as regulatory affairs.

A panel member asked whether there was an inclusion of a work based project and the Head of Department explained that students could take a L6 Certificate in Work Based Project 30 credits SPA afterwards (in addition) and then progress to a Level 7 if there was suitable work experience. If a student did not currently hold a position in an appropriate work environment they can take this SPA through a research based approach.

The panel highlighted the omission of a matrix mapping modules with learning outcomes in the submission document. They queried the lack of risk assessment in the programme. Staff responded that this was a fundamental part of the course and that a risk based approach was part of the validation modules and that FMEA was covered in the Validation Application module.

The Panel expressed some disappointment with the resources listed in the module descriptors and that they would need to be updated with more recent material. This has since been addressed in module descriptors.

BEng (Hons) in Precision Engineering L8 Add-on

The panel was keen to explore the differentiation between the Mechanical degree and the Precision Engineering degree as they had concerns that this was not adequately detailed in the documentation. They asked staff to show where the ambition and differentiation was for this programme. The Programme Coordinator explained that while the first two years of the L6 and L7 were almost identical with the Mechanical Programme, specialist modules and learning outcomes were included on the final year of the Level 7 and on this proposed Level 8 programme. This would be the only course in Ireland training Injection Mould Designers, but would also graduate Engineers competent in Metrology, Validation, Six Sigma, CNC/CAD/CAM, Polymer Processing and Advanced Manufacturing. The programme has ambitious targets and would be significantly different from any general Mechanical Programme in the State.

Students completing the BEng in Precision Engineering meet the requirements of the internationally recognised Six Sigma Green Belt award. Students receive this award in addition to their degree by sitting an external Green Belt exam. Staff commented on Forfás and other reports which highlighted the need for design, polymer processing, and lean manufacturing skills in engineering graduates and these were all being addressed on this programme. There is substantial teaching on CNC on L6/7/8. A survey of the industry acknowledges the need to be ready for the next wave of technology. The Advanced Manufacturing Technology module covers CNC and Industry 4.0, and lecturers will aim to cover the new technologies engineers will need in future. The Programme

Coordinator highlighted the success they have had with the previous Tool Design Programme and its graduates.

The Head of Department brought up the important part the substantial work placement plays in differentiate this programme from Mechanical Engineering programmes and others. There are plans in place to create PEM (Precision Engineering and Manufacturing) Centre of Excellence and €1 million investment has been allocated by the Institute and there is a submission in with HEA for a further €14 million investment.

The panel was interested to know at what stage a student can transfer from the Mechanical Engineering stream to the Precision Engineering stream. This should not be done at a later stage than after the L6 however a transition could take place after Level 7 depending on work experience. Staff and panel acknowledged that it is difficult to attract CAO students to a path of Precision Engineering and this option is more attractive after they have completed their L6.

A panel member queried the rationale for the course being a 2 year Level 8 as supposed to 1. The staff team responded that if the course had been designed as a 1 year L8 they would not have been able to incorporate a satisfactory period of work placement and meet all of the ambitious learning outcomes planned for this programme. The BEng in Civil Engineering at IT Sligo is currently also a two year add-on programme.

Meeting with the programme development team

Attendees

Validation L6

Stephen Daly	Ailish Breen
Mary Nolan	Fiona O'Donovan
Kieran Tobin	

Precision L8

Brian Coll	Ashley Feeney
Ray Cotter	Hanrahan, Brian
Robert Craig	Moffatt, Michael
Leo Creedon	Mulligan, David
Sean Dalton	Mary Nolan
John Donovan	David Tormey
Donal Lyons	

Precision L6

Colleary, Niall	Price, Eamonn
Ferry, Paul	Sheridan, Declan
O'Gorman, Louise	

The Panel chair welcomed the additional staff and introductions were made.

BEng (Hons) in Precision Engineering L8 Add-on

A panel member started the discussion querying the level of Lean Manufacturing in the Programme. Staff replied that they ensured students built up a strong awareness of inventory control and that systems such as SMED and Poka Yoke were used although there is more of a focus on operation management techniques.

A panel member highlighted the industry need for students to be aware of the importance to reducing cycle times.

The panel again highlighted the various standards used for writing module descriptors and that there should be a uniform approach when several lecturers write modules for a programme. In addition the resources were out of date and needed to be brought up to date to be more relevant.

The work placement was discussed in great detail as the panel were keen to explore how the Programme Boards will ensure it is worthwhile. The Programme team responded by outlining that the placement is very structured and controlled. There are clear objectives given and it is assessed and graded. They will have strict agreements with the companies and students will have to be placed in Precision Engineering roles within the companies. Staff members mentioned how the students' knowledge was significantly enhanced after the industrial placement when they returned to the Institute and they could incorporate what they had learnt in to their studies. The role of the Institute, Staff, Company and Student is detailed in the submission document. The panel strongly recommended that a clear template should be developed to ensure consistent quality placements.

A panel member queried how staff could stand over having 14 learning outcomes for the placement; they felt it was too detailed and over ambitious. The programme team responded that there were 7 learning outcomes for the first 6 months of placement and 7 further outcomes for the second placement. There were concerns of how the Institute would handle if a student failed the placement. In this scenario the student would have to repeat their placement in full.

The panel asked about the intake for 2016/17. The current target is 14-16 as this is the cohort of students currently in the L7 Precision Engineering programme. For 2017/18 the target is 16.

The students would develop research and project skills both in the L7 Project management module and while on placement through report writing. The scope of the Six Sigma project is decided during the placement in discussion with the company. Student will be part of a greenbelt project. The assessment of the Six Sigma and Placement was clarified by staff.

The panel wanted staff to explore what the course will achieve and what we can expect in the future. Staff responded that the students now are different in that the only find

information out when they need it rather than studying formula. They are all very competent in technology. The students they try to attract would have skills to be able to learn, eye for precision and to carry that ethos with them in to the work place. They would fill the void industry is currently experiencing and many world class producers are based Ireland where students would be a valuable asset.

The panel pointed out the importance for staff to up-skill constantly, by attending tradeshows etc, to ensure they can teach students what is coming down the line. It would be recommended that student get this exposure as well. They also highlighted that the future in precision engineering lies in 3D and metal printing.

HC in Precision Engineering L6

The panel probed the team on the lack of group work and laboratory time apparent in the Programme. The module Introduction to Engineering involves a group based project which is aimed at exposing students to team work. This module aims to provide students with an opportunity to develop their soft skills. Laboratory work is evident in workshops in modules such as CAD, Design 101/102, Mechanical Technology and Mechatronics and Automation Technology which all have practical elements.

Staff highlighted the need for the L6 as it appeals to a more mature student cohort.

The panel were concerned with the amalgamation of some subjects such as Maths and Mechanical. The Programme Team responded that they were aware of the issues that could arise with failed elements; however, this was as a result of semesterisation and the need to keep both subjects as yearlong subjects. Staff was hopeful that some of this could be resolved in the next Programmatic Review due in a year's time.

The panel believed the module descriptors were almost identical between Advanced Manufacturing 101 and 102. The reason for this duplication is that staff wanted to highlight the safety aspect of working in an unsafe environment. A similar duplication of description was highlighted in the module CIM and Automation. Staff explained that the modules were not quite identical as 201 was dealing with basic pneumatics and 202 was dealing with advanced pneumatics.

One panel member urged the Programme boards to bring the L6 online as soon as possible as it would be attractive to students and companies. The Programme team responded that the first aim was to bring the L7 online as there was a more immediate requirement for this allowing for example qualified toolmakers to progress to a L7.

Summary of Findings

The Panel recommends to Academic Council that it approve the Programme.

Commendation

The Panel wished to note the aspiration to have 3D printing, as well as the annual Engineering Expo to show case students work. They wanted to commend staff for attending trade shows and inviting visiting lecturers.

Panel Conditions

1. That a placement memorandum of agreement, setting out a rubric for the content and the conduct of the Industrial placement be devised. And that the number of assessed elements of the placement would be reduced.

Panel Recommendations

1. Review reading list and reference material for all modules for all three programmes to bring them up to date
2. Module descriptors derived from various sources. To be reviewed with a view to achieving a more uniform format
3. L6 Validation. Matrix mapping modules content with learning outcomes included in submission documents
4. Amend course schedule pg5 to show correct percentages for assessment:
Advanced Manufacturing Technologies & CAM – PC 20%, FE 30%
Engineering Analysis and Simulation PC 40%, FE 60%
5. Recommend that the L6 Precision Engineering be delivered online at an early date.

Signed on behalf of programme validation Panel

Tom Cullivan

Chairperson

Date: 18th May 2016

Ms Annica Rasmak

Recording Secretary

Date: 18th May 2016