

New Programme (Major Award) External Validation Report

Section A

Report of the External Review Panel

Programme Reference Number:	15
Faculty/School(s):	School of Engineering
Department(s):	Dept of Mechanical and Industrial Engineering

Details of Programme(s) Reviewed

Title:	BEng (Hons) in Advanced Manufacturing Engineering
Type of Award:	Honours Degree
NFQ (National Framework of Qualifications) Level:	8
ECTS:	240
ISCED:	0720 – Manufacturing and Processing
Duration:	4 years
Proposed Student Intake:	62 (combined intake)
Proposed Start Date:	September 2024
Delivery Mode(s):	Full-time

Title:	BEng in Manufacturing Engineering
Type of Award:	Ordinary Degree
NFQ Level:	7
ECTS:	180
ISCED:	0720 – Manufacturing and Processing
Duration:	3 years
Proposed Student Intake:	62 (combined intake)
Proposed Start Date:	September 2024
Delivery Mode(s):	Full-time

Title:	Higher Cert in Engineering in Manufacturing Engineering
Type of Award:	Higher Certificate
NFQ Level:	6
ECTS:	120
ISCED:	0720 – Manufacturing and Processing
Duration:	2 years
Proposed Student Intake:	62 (combined intake)

Proposed Start Date:	September 2024
Delivery Mode(s):	Full-time

Date of Review:	01 February 2024
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Review Panel

Panellist Role	Title	Name	Organisation	Job Title
Chair	Dr	Joe McGarry		Senior Educationalist
External Academic Discipline Expert	Mr	Mark McGrath	TU Dublin	Senior Lecturer
External Academic Discipline Expert	Dr	Waqas Saleem	TU Dublin	Lecturer
Industry/ Community Representative	Mr	Brian Dunne	SKBIOTEK	Associate Director
Student Representative	Ms	Ontiretse Ishmael	ATU	Research Student
Vice President for Academic Affairs and Registrar (VPAAR) Nominee (Academic Secretary)	Ms	Carmel Brennan	ATU Galway Mayo	Assistant Registrar

All external members of the panel have declared that they are independent of ATU (Atlantic Technological University), and all have declared that they have no conflict of interest.

Programme Design Team

The panel met the following during the review process.

Prof Graham Heaslip, ATU	Barry Commerford, Consortium Chair
Dr Carine Gachon, ATU	Trish Breen, IBEC, Consortium Project Management
Dr Paul O'Dowd, ATU	Dr Yvonne O'Byrne, IBEC, Consortium Project Management
Martin Burke, Bay Enterprises	Greg Reddin, Johnson & Johnson, Consortium Vice-Chair
Paddy Glacken, Embecta	Yvonne Moran, GRETB (SOLAS Authorised Officer)
Cian Anderson, DePuy Synthes	Xavier Velay, ATU
David McMoreland, ATU	Sean Conway, TUS
Niall Morris, MTU	Darren Fitzgerald, MTU
Dr Philip Long, ATU	Martin Conneely, ATU
Dr Trevor Clohessy, ATU	Dr Doru Boblea, ATU
Dr Aurora Dimache, ATU	Gabriel Farragher, ATU
Dr Jack Saad, ATU	

Introduction

This national apprenticeship programme has been developed by ATU Galway in collaboration with, and on behalf of, an Industry-led Apprenticeship Consortium composed of over 100 companies. Led by IBEC, the Consortium includes both employers and academic providers, and is responsible for the development and provision of the manufacturing apprenticeship programme across Ireland to meet labour market needs. As the Coordinating Academic Provider, ATU Galway is responsible for the development and maintenance of the curriculum and assessment procedures for the programme and leading the collaborating providers involved to ensure that ATU Galway's Academic Quality procedures are upheld and adhered to.

The programme is expected to be delivered nationally across all existing collaborating providers including MTU, ATU Sligo, and TUS, and will be rolled out further if and when required as new providers are identified and approved by the Consortium and the HEA to meet increased demand.

The manufacturing sector in Ireland is thriving and boasts the highest share of employment in manufacturing industries in Europe with 260,000 people working across 4,000 businesses. Ireland is also a leader in high-technology manufacturing with the highest share of manufacturing jobs in high-technology sectors as a share of total employment in the EU. However, there is a shortage of Manufacturing Engineering talent nationally and this growing skills gap is a "major concern" for the sector. The lack of supply of qualified engineers with the skills needed to adapt to emerging technologies coupled with the demonstrated efficacy of the Level 6 and Level 7 apprenticeship programmes has resulted in a large number of employers willing to invest in the continued professional development of their staff.

A survey of apprentice employers completed in February 2021 by ATU, then GMIT, to assess progression routes and gauge interest in the development of a Level 8 Manufacturing Engineering honours Degree programme found that over 80% of employers were interested in having an academic progression route for their apprentice to Level 8. A survey completed in January 2021 of Manufacturing Engineering Level 7 Graduate apprentices showed that 100% of graduates would be interested in extending their studies to Level 8.

Smart factories represent a shift toward the future of manufacturing, where data, connectivity and automation are leveraged to create more agile, efficient, and competitive production facilities. A smart factory is a highly digitised and interconnected manufacturing facility that leverages cutting-edge technologies (including automation, robotics, digital twin, and additive techniques) and data-driven insights (including internet of things, supply chain integration and data analytics software) to optimise and transform various aspects of the production process. The primary aim of the smart factory is to enhance operational efficiency, agility and productivity while reducing costs and errors.

While operating within this highly regulated and complex environment, advanced manufacturing engineer graduates from this programme will be equipped with the knowledge and tools to maintain operational efficiency of equipment, machinery and tools, make data-driven decisions and apply engineering principles to solve problems, and identify opportunities for innovation to improve the agility, productivity or cost-effectiveness of the manufacturing process in line with the strategic values of the company.

See Appendix for Entry Requirements, Programme Learning Outcomes and Approved Programme Schedule following the validation.

Rationale for Programme(s)

The aim of this programme is to address the significant supply shortage and growing skills gap by developing a pipeline of innovative industry-ready Level 8 engineers with the knowledge, skills, and competence to be able to improve the productivity, quality, and efficiency of sustainable smart manufacturing operations. As a result of the rapid growth of advanced manufacturing over the past decade, the skills requirements of engineers have changed. The advanced manufacturing sector today needs workers equipped with the knowledge of new technologies and sustainable techniques to lead in this new era of advanced manufacturing and digitisation.

The objective of this programme is to equip graduates with the following skills and competencies:

- Apply and adapt emerging technologies and data science to solve engineering problems.
- Continuously improve manufacturing processes through projects, using the latest technologies and methods to increase quality and output, and reduce costs, in an ethical and environmentally responsible manner, while maintaining production support.
- Act as a technical lead for process improvement projects, new product introductions, new equipment installations, data analysis and product validation.
- Tackle higher-level technical tasks for example the data networking systems and equipment integration involved in the transition to industry 4.0.
- Lead negotiations with suppliers/customers and present to management in relation to their projects and processes.
- Mentor junior engineers and technicians

This programme has two embedded awards, the Higher Certificate in Manufacturing Engineering and the B Eng in Manufacturing Engineering.

The first two years of this programme are identical to those in the Higher Certificate in Manufacturing Engineering and the first three years of this programme are identical to those in the B Eng in Manufacturing Engineering.

Validation Criteria

ATU's Developing and Validating New Taught Programmes Policy specifies that new programmes must comply with the following criteria for validation:

1. The programme aims and learning outcomes are clear and aligned with the proposed award title.
2. The rationale for the programme is well informed and justified.
3. The design of the programme is suitably structured and fit for purpose.
4. The design of the programme ensures that students can successfully achieve the Programme Learning Outcomes.
5. The teaching, learning and assessment strategy is well planned and appropriate for the discipline area and type of award.
6. Assessment techniques are fair, valid, reliable, consistent and a credible measure of the academic standard attained by students.

7. The planned resources, including staff, physical, online, library and student supports, sufficiently support the teaching, learning and assessment strategy for the programme.
8. The programme facilitates lifelong learning for a diverse student population by setting out appropriate entry requirements and opportunities for access, transfer, and progression.
9. There is demand for potential graduates from the programme.
10. The learning environment and mode of delivery are consistent with the needs of the intended students of the programme and accessible and appropriate support services for students have been provided for.
11. Students will be well informed on the requirements of the programme, guided to relevant resources and supported in their studies in a caring environment.

Findings

Overall Finding

Validated without changes	
Validated subject to condition(s) and/or recommendation(s)	X
Rejected	

Reason for Overall Finding

Having reviewed the documentation provided and questioned the programme development team, the panel were satisfied that there is a strong need for the proposed programme, and that the programme as designed is fit for purpose. There is additional complexity given that the proposed programme is a consortium apprenticeship, but the panel were satisfied that the proposing team have experience at managing apprenticeships and have thought through the coordination of the programme, having substantial documentation to back this up. Therefore, the panel is satisfied to recommend the programme for approval subject to the recommendations listed below.

The Validation Panel advises Academic Council that subject to satisfying any condition(s) detailed below, the panel is satisfied that the proposed programme(s) meets the validation criteria as set out in the Atlantic Technological University's Developing and Validating New Programmes Policy.

Commendations

The Validation Panel advises Academic Council of the following commendations.

1. The panel commended the comprehensive and rigorous documentation prepared by the Programme Development Team which provided a thorough description of the programme and its delivery and management.
2. The extensive research undertaken and the engagement and coordination between all of the stakeholders involved was praised.
3. The panel commended the team on the generation and coordination of the documentation developed to support the programmes and which, in turn, support consistency of standards and the student experience.

Conditions

None.

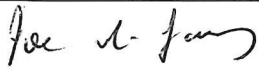
Recommendations

The panel advises Academic Council that the Programme Development Team and/or the Department should take cognisance of any recommendations outlined below.

1. Embed sustainability more thoroughly and explicitly in stage 4 of the programme. This task should also be undertaken in the first three stages when the programme is next reviewed. Ensure sustainability is included in the industry blocks with sustainability assessed as appropriate.
2. Review the balance of assessment and final examinations in the final stage of the programme. This should be with a view to increasing the weighting of the practical assessment elements given the nature of the programme and its content.
3. The coordinating provider should ensure that the human, physical and software requirements are in place prior to commencing delivery of the programme at a site.
4. Review the module descriptions within the descriptors to ensure that they consistently provide an overview of the module rather than details of content or learning outcomes. Ensure that the descriptions do not refer to other modules.
5. Review reading lists for modules in all stages of the programme, ensuring that books are up to date in all instances.
6. Quality 1 module – Remove reference to chapter 3 in the assessment strategy.

Report Approval

This report has been agreed by the review panel and is signed on their behalf by the chairperson.

Signed:  Name <i>JOE N. BARRY</i> Validation Panel Chair	Date <i>05/04/2024</i>
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