

Part 1 Programme details

Existing title and code	TPC – TU Dublin Joint Mechatronics Programme DT7035
Mode and duration of programme	Three years, full-time
ECTS	180
TU Dublin award(s) sought	Bachelor of Engineering Technology in Automation Engineering
Exit awards proposed	None
Classifications of award(s)	Distinction; Merit Grade One; Merit Grade Two; Pass
School responsible	School of Mechanical & Design Engineering (TU Dublin) and Automation Engineering Department (TPC)
Professional body accreditation and relevant dates (where applicable)	Award is accredited by Engineers Ireland for associate membership
External provider type (where applicable)	Tangshan Polytechnic College, China – Franchise of TU Dublin programme
Delivery location	Tangshan Polytechnic College, China

Part 2 Programme approval information

Date of review event	16 March and 23 March 2021
Date of final approval of report	

Part 3 Programme background/structure

Background

Tangshan Polytechnic College (TPC), previously Tangshan Industrial Vocational Technical College is a public funded higher vocational college authorised by the Chinese Ministry of Education (MoE) located in Tangshan, an industrial city in Hebei province. In 2016 the Dublin Institute of Technology entered into an agreement with TPC whereby the School of Mechanical and Design Engineering's Bachelor of Engineering Technology programme would be delivered in TPC by TPC teaching staff to TPC students. It is a requirement of the Chinese Ministry of Education that TU Dublin staff deliver one third of the programme modules and one third of the hours for the programme. TU Dublin staff attend TPC for three weeks in December to deliver six modules through accelerated, block delivery and again in May where four

modules are delivered. Modules are delivered through English and Chinese (approximately 50% each) in year one, mainly through English in year two (approximately 75%) and entirely through English in year three. Students also must take English language modules to support their language learning, and in order to satisfy the requirements for the TPC Diploma award they must take additional modules in PE and politics.

The Joint Mechatronics programme provides a thorough grounding in the scientific, technological and application principles relating to automated manufacturing technology. The programme will make available learning opportunities to allow students to gain the technical and personal skills required to pursue a career which will allow self-development, and enable them to contribute to modern manufacturing industries. The Mechatronics degree programme aims to provide graduates with the appropriate mix of technical, managerial and communication skills, in order to equip them for a wide range of careers within a broad spectrum of industries home and abroad.

To date, out of the 131 students who have enrolled on the programme, 39 have been awarded the TU Dublin BEng Tech in Automation Engineering.

Stated learning outcomes of the programme

On completion of the programme the Mechatronics Technologist will be able to:

1. Apply a body of knowledge and a range of skills to the integration of Mechanical, Manufacturing, Electrical and Electronic systems with Software Engineering and Computer Technology at a level appropriate to modern automation and manufacturing systems.
2. Design, develop and construct a range of electromechanical systems operating under programmed control.
3. Explain and assess the functionality, operation and integration of a variety of electro-mechanical hybrid devices, equipment and systems.
4. Use tools, machines and materials in a safe manner, identify hazards and evaluate risks.
5. Use a range of software-based engineering tools and applications, as well as word processing, spreadsheet, database and presentation software.
6. Locate, evaluate and utilise relevant information from technical manuals, drawings, databases and other sources.
7. Demonstrate relevant transferable and interpersonal skills, such as, communications, teamwork, project management and self-management skills.
8. Distinguish between management functions and supervisory roles and be capable of implementing them within a high technology organisation.
9. Carry out their role within society in an ethical manner.
10. Communicate effectively through the English language.

Programme structure

The first stage of the programme is a full academic year of two semesters, 35 weeks in total. The second stage of the programme consists of one full academic semester of 18 weeks, followed by a work placement of 20 ECTS which must be of at least 12 weeks duration. The third stage of the programme is a full academic year consisting of two semesters, 36 weeks in total, including a final project.

Entry Requirements

The requirements for admission to the programme are:

For high school students who take part in the national university entrance examination, students shall graduate from high school; and their scores in the national university entrance examination shall not be less than the admission score of Hebei Province for college students (Note: the admission score is determined and published by the Education Department of Hebei Province every year).

For secondary vocational and technical school students and high school students who take part in the exclusive recruitment examination for high vocational college: a) students shall graduate from secondary vocational and technical school or high school; b) their scores in the exclusive recruitment examination for high vocational college shall not be less than the admission score; c) their qualifying interviews are assessed by the Department of Automation Engineering.

Student assessment

In accordance with TU Dublin's General Assessment Regulations. In some cases where is more than one assessment component, minimum thresholds of performance apply.

Derogations from the General Assessment Regulations, including rationale for derogation and view of the Panel:

None sought.

Part 4 Review Details and Membership of Panel

The review took place over two days, 16 & 23 March 2021, via Microsoft Teams.

16 March 2021 (via Microsoft Teams)

Irish Standard Time	China Standard Time	
8.00 hrs	16:00 hrs	Introductory meeting of Review Panel with the Dean of College of Engineering & Built Environment and key staff from the School of Mechanical & Design Engineering, TU Dublin.
8.30 hrs	16:30 hrs	Private meeting of Panel to discuss and draw up an agenda of matters to be raised at meetings with the School and teaching staff.
9.15 hrs	17:30 hrs	Meeting of Panel with key staff with responsibility for the programme to discuss specific issues raised by the Panel.
10.00 hrs	18:00 hrs	Meeting of Panel with TU Dublin staff teaching on the programme in TPC.

10.45 hrs	18:45 hrs	Break.
11.00 hrs	19:00 hrs	Private meeting of Panel to plan agendas for subsequent meeting with TPC management, staff and students, and identifying additional documentation.
12.00 hrs	20:00 hrs	Feedback to School in preparation for meeting with TPC.

23 March 2021 (via Microsoft Teams)

Irish Standard Time	China Standard Time	
8.00 hrs	16:00 hrs	Introductory meeting of Review Panel with Head of School and Programme Chair from TU Dublin, representatives of Senior Management of Tangshan Polytechnic College and TPC Programme Chair
8.30 hrs	16:30 hrs	Private meeting of Panel to discuss and draw up an agenda of matters to be raised at meetings with the TPC staff, students and graduates
9.00 hrs	17:30 hrs	Meeting of Panel with key staff with responsibility for the programme at TPC and relevant support staff to discuss various matters.
10.00 hrs	18:00 hrs	Break
10.10 hrs	18:10 hrs	Meeting of Panel with current students and graduates.
10.45 hrs	18:45 hrs	Meeting of Panel with TPC teaching staff to discuss learning, teaching and assessment issues
11.45 hrs	19:45 hrs	Private meeting of Panel to discuss its report
13.00 hrs	21:00 hrs	Verbal report back to TU Dublin and TPC management and staff School on the Panel's findings.

Panel Membership

Dr Colin Hughes (Chair)	Head of Graduate Business School, TU Dublin
Professor Anne Greene	School of Chemical & Pharmaceutical Sciences, TU Dublin
Louise Lynch	School of Civil & Structural Engineering, TU Dublin

External members

Dr Fergal O'Rourke Department of Electronic & Mechanical Engineering, Dundalk
Institute of Technology

Mr Yu Shuli General Manager, Tanghsan Modern Industrial Control
Technology Co. Ltd

Quality Assurance Officer

Jan Cairns Quality Assurance Officer, TU Dublin

Documentation submitted

The Panel received the programme document, Student Handbooks, TPC self study, Programme Implementation document, Work Placement Handbook and annual monitoring reports and external examiner reports

Part 5 Findings of the Panel

The Panel is pleased to recommend continuing approval of the TPC – TU Dublin Joint Mechatronics Programme leading to the TU Dublin award of Bachelor of Engineering Technology in Automation Engineering at Level Seven on the National Framework of Qualifications. The programme also leads to the TPC award of Diploma in Mechatronics. This approval is subject to one condition and the Panel also makes several recommendations.

The Panel acknowledges the great commitment of TPC and the School of Mechanical & Design Engineering to this programme and the significant dedication and hard work on the part of both parties to the smooth running of the programme.

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Resources and facilities available to the programme

Unfortunately the Panel was not able to visit TPC's campus and facilities as part of this review. However, it did receive information on the facilities and equipment available and a video of the campus and the Department of Automation Engineering and it was impressed with what it saw, in particular the facilities and equipment relevant to the programme which it considered to be advanced. TPC reported that it is well supported financially by the government to enable them to update their equipment. TPC had a library and in addition students have access to TU Dublin's on-line resources.

Student support

The Panel notes the supports available to students at TPC. The General Education Centre can provide additional academic support as required, for example in mathematics and English. TPC has a Health Centre and Counselling Service on campus, and the Panel notes that students reside on campus during their studies. The Panel met a tutor on the programme with a specific pastoral role to support students.

Condition

The concerns around students' ability to reach an appropriate standard of English to be eligible for the TU Dublin award were acknowledged by all. The Panel notes the various approaches to addressing this concern that were reported during the review. However, the Panel required that an integrated, cohesive plan to support the improvement of the English language proficiency of students be presented, to enable more students graduates with the TU Dublin award. The plan should address English language ability on entry to the TU Dublin programme, how it is assessed and standardised throughout and at the end of the programme when eligibility for the TU Dublin award is considered. The Panel considers that TU Dublin and TPC should work together to come up with this plan. It suggests also that the following should be considered:

- Where possible, more TU Dublin staff should travel to TPC to support language learning and interaction;
- Greater collaboration between the programmes at TPC and TU Dublin including supported interaction between students, such as a buddy /peer mentoring system.

Recommendations

1. It is a requirement of the Chinese Ministry of Education that TU Dublin delivers one third of modules on the programme in TPC. Staff travel each semester to TU Dublin: in semester one staff go to TPC for a three-week period to deliver six modules and in semester two staff go for three weeks to deliver four modules.

The Panel met with the TU Dublin staff who currently deliver this programme and it notes that this three-week delivery is intensive and proving challenging for students. The Panel considers that these sessions that include intensive English delivery may have a negative impact on students who are considering whether to opt only for the TPC delivery rather than continue towards the TU Dublin award. It strongly recommends that the School of Mechanical & Design Engineering and TPC consider how to alleviate this for staff and students, whether through more extended attendance by TU Dublin staff, moving some of the delivery online in advance of face-to-face delivery, or the engagement of TPC staff in the delivery of these modules.

2. TPC and TU Dublin should further consider how to promote and market the programme more effectively to reach the target annual student intake of 60. It recommends that it explore the use of testimonials from recent graduates as part of this promotion.
3. The Panel notes that while several TPC staff have spent time in TU Dublin as part of their staff development, the potential benefits of this collaboration for TU Dublin have not been fully realised. It recommends that the School of Mechanical & Design Engineering together with TPC explore further staff and student exchanges whereby TU Dublin staff and students travel to TPC.
4. The Panel had noted the need for the inclusion of new technologies around AI to support local industry, as expressed by the external industry panel member. The School of Mechanical & Design Engineering reported that a new module in Robotics has recently

been approved to run in the TU Dublin programme and will run in TPC from September 2021. It also reported plans in TU Dublin to develop a degree programme to replace this level seven programme and that this new programme will cover the new technologies referred to above. The Panel recommends that TPC are informed of and involved in this programme development as soon as possible.

5. The Panel notes that the module descriptors across the programme in TU Dublin and TPC would benefit from review and updating, in terms of module learning outcomes, assessment methods and reading lists. It recommends that this should be conducted through the College processes.
6. It has been noted that many of the above recommendations that might contribute to the success of the programme are to a large extent dependent on policies and practice within TU Dublin. The Panel notes that it has been a challenge for the School to identify full-time academic staff to teach in Tangshan and therefore most of those now travelling to TPC are part-time staff. The Panel recommends that TU Dublin should consider how its policies and structures might be revised to support its stated priority of internationalisation, including:
 - incentivising academic staff to travel to teach on programmes delivered internationally, such as recognising this work as a criterion for progression/promotion, granting time allowances;
 - a financial model that supports such international initiatives;
 - a central office that deals with how programmes of this nature interact with University administrative functions, e.g. Registrations, Examinations, Fees and Income etc.
7. The School of Mechanical & Design Engineering have accrued much experience and knowledge from its involvement in this programme, and it would have benefitted greatly from the advice of others within the institution at the outset of this collaboration. The Panel recommends that a mechanism within the University be created to share and build on learning from the experiences of those within the University involved in international collaborations, in order to enhance knowledge and allow further opportunities for collaboration to be pursued.