Professional Diploma in Quantum Engineering
Two Years Part Time (September start)

Introduction

Quantum engineering and computing is at the heart of digital transformation and is a long-term research priority area in the EU and worldwide. Access to online quantum computing frameworks, quantum system simulators, and existing quantum computers combined with the progress in high performance computing, materials and electronics for quantum computers accelerated the field over the past decade. This enabled the development of new quantum algorithms and a significant expansion of quantum computing applications. Currently, many problems are being rethought and reformulated as problems for quantum computing. The field of quantum computing and engineering is a multidisciplinary field and benefiting from both, academic and industrial leadership and contribution.

Course Highlight

The programme allows a student to build a focus either on the computational side of quantum engineering & computing and or on the physics of quantum computing.

Course Content and Structure

The Professional Diploma comprises one mandatory and three optional five-credit modules in the field of Quantum Engineering. At the core of the programme are two modules covering basic and advanced concept of quantum computing that combine fundamental theory, code and algorithms examples and relating it to physics of qubits. Students already familiar with fundamental concepts of quantum computing can opt for just one of the two modules.

All lectures are in the morning of weekdays with labs in the afternoon. Remote lectures & labs are available in selected modules. Please note that some attendance (usually up to 4 hours per week) may be required as some modules do not have online options and may have in-person exams.

Modules offered

- Introduction to Quantum Computing
- Foundation of Quantum Mechanics
- Machine Learning
- Applied Quantum Mechanics
- Quantum Computing
- Data Science in Python
- Quantum Theory of Condensed Matter
- High Performance Computation (ICHEC)
- Maths of Quantum Computation

* For those who wish to take individual modules, but not the diploma, please contact the ADVANCE Centre - info@advancecentre.ie

Why study at UCD?

Graduate education
12,800 graduate students; 17% graduate research students; structured PhDs

Global community
9,500 international students and a 300,000 alumni network across 165 countries

Global Profile
UCD is ranked in the top 1% of higher education institutions worldwide

Global careers
Dedicated careers support; 2-year stayback visa to work in Ireland
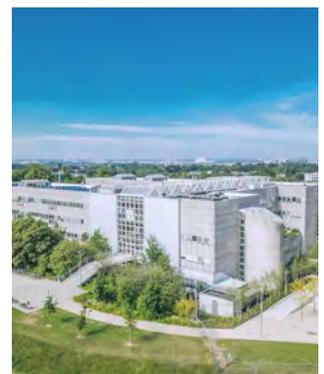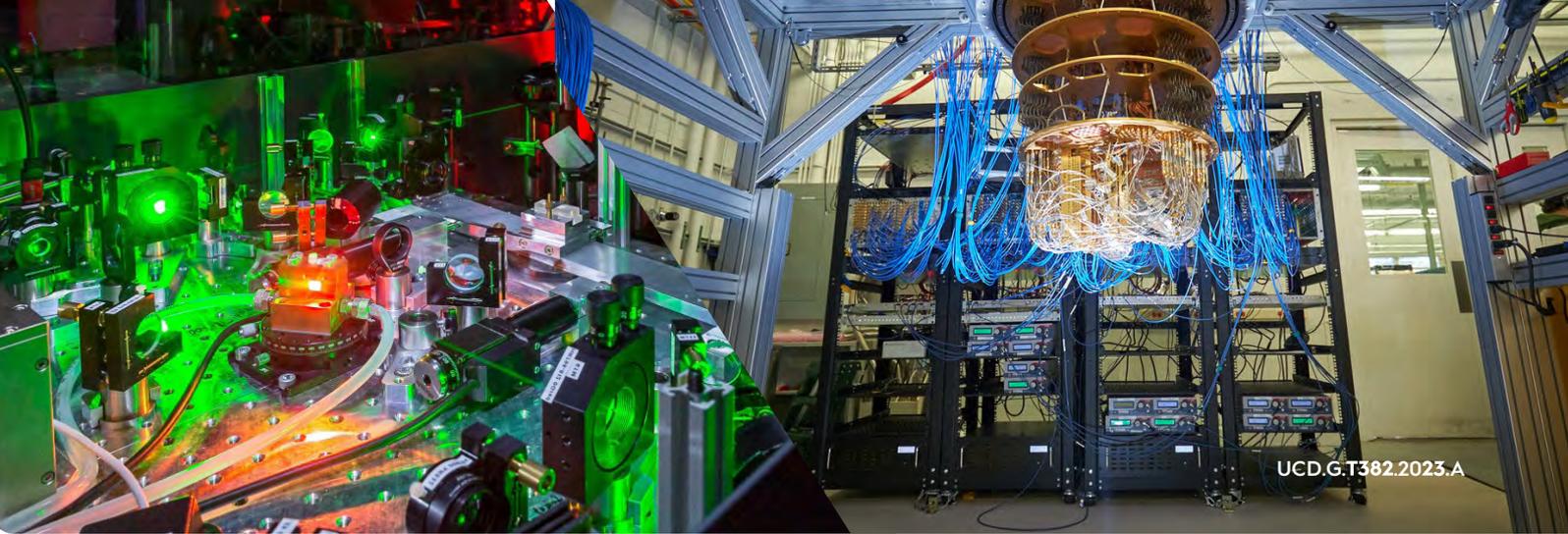
Career Opportunities

The programme represents an opportunity for those who have previous experience or are currently employed in the field of computer science, computer engineering and electronic engineering who wish to expand their expertise to understand quantum computation and quantum technologies.

Many international companies and many major industry partners with presence in Ireland including IBM, Google, Microsoft, Intel. In addition to that the multinational companies in the electronics industry, including Analog Devices, Cadence.

Programme Director

Assoc Professor Elena Blokhina

"Quantum science and technology are facilitating complex computational tasks to advance the fields of communications, security, modelling, simulations and sensing. Whether you are interested to understand the foundations of quantum theory or to try some elements of quantum computations, the programme offers you this opportunity with a combination of blended and face-to-face modules."

Applicant Profile

- Applicants should hold a NFQ Level 8 (or international equivalent) BE degree in Electrical Engineering or equivalent.

- Applicants whose first language is not English must also demonstrate English language proficiency of IELTS 6.5 (no band less than 6.0 in each element), or equivalent.

Tuition Fees
Tuition fee information is available on www.ucd.ie/fees.

Related Masters Programmes of Interest
- Professional Diploma in Power System Analysis
- Professional Diploma in Operations Excellence
- Professional Diploma in Electronic Design

Programme offered as part of the

Advance Centre

www.advancecentre.ie

APPLY NOW

This programme receives significant interest so please apply early online at **www.ucd.ie/apply**