Overview
The School of Computing is a stimulating environment for research, particularly in the areas of localization, data analytics, software engineering, scientific computing and cloud computing. It currently has 60 postgraduate research students and a wide range of funded projects at national and international level.

This document details the structured doctoral pathway for the School of Computing in DCU. While the main focus for each research candidate is to complete a piece of original research presented in thesis format, students are also supported in developing a range of skills and competencies through taught modules and other learning opportunities.

During their registration, all research students may take a mix of credit-bearing modules (Graduate Training Elements or GTEs), and other non-accredited education opportunities such as workshops, seminars and short courses. These opportunities provide both discipline-specific and transferable skills and knowledge to support students in their research and enhance their research qualification. Engagement in these activities is an important aspect of the graduate researcher experience.

Students following the structured pathway must attain a minimum of 20 credits in accordance with university structured PhD requirements. Students should take at least one module each from the discipline-specific, and transferable skills lists of modules. The structured pathway for each PhD student should be discussed and agreed in the first instance with the supervisor and progress recorded on the annual PGR2 form. Once approval has been given, the student can register for their chosen GTE(s) during the online registration process.

Induction and non-accredited training
Students are encouraged to take advantage of the additional training opportunities offered by the Graduate Studies Office (GSO) and by the School as appropriate. All students are required to attend the orientation and induction sessions organised by GSO during year one. GSO communicates details of their training schedule to each student at the beginning of each semester. First year students are also required to take the Online Research Integrity Training Module during semester one of their studies.
School of Computing

Structured Doctoral Pathway 2018-19

**Discipline-Specific Skills**
7.5 ECTS unless otherwise stated

**SOFTWARE ENGINEERING**
- Systems Software - CA644
- Formal Programming - CA648
- Software Process Quality - CA650

**SECURITY & FORENSIC COMPUTING**
- Cryptography and Number Theory - CA642
- Forensic Computing - CA643
- Network Security - CA645
- Public Key Cryptography and Security Protocols - CA646
- Secure Programming - CA647

**DATA ANALYTICS**
- Mathematical Methods/Computational Science - CA659
- Statistical Data Analysis - CA660
- Data Management and Visualisation - CA682
- Data Analytics and Data Mining - CA683
- Machine Learning - CA684
- Information Access - CA652

**CLOUD COMPUTING**
- Concurrent Programming - CA670
- Cloud Architectures - CA674
- Cloud Technologies - CA675
- Machine Learning - CA684

**Transferable Skills**
7.5 ECTS unless otherwise stated

- Induction - Semester 1, Year 1, Coordinated by GSO (non-accredited)
- Online Research Integrity Training Module (Engineering and Computing stream) (non-accredited)
- Advanced Scientific Communication Skills - CA637 (5 ECTS)
- Professional Research Practice - CA640
- Postgraduate Tutoring Principles & Practice - GS602 (5 ECTS)
- Research Ethics - GS604 (5 ECTS)
- IP & Commercialisation - GS601 (5 ECTS)
- Enterprise Experience for Graduate Research Students - GS606 (10 ECTS)
- Entrepreneurship for Engineers - EE507
- English for Academic Purposes - LC600 (5 ECTS)

Students are also encouraged to engage with centrally and locally offered workshops and seminars that align with their development needs.