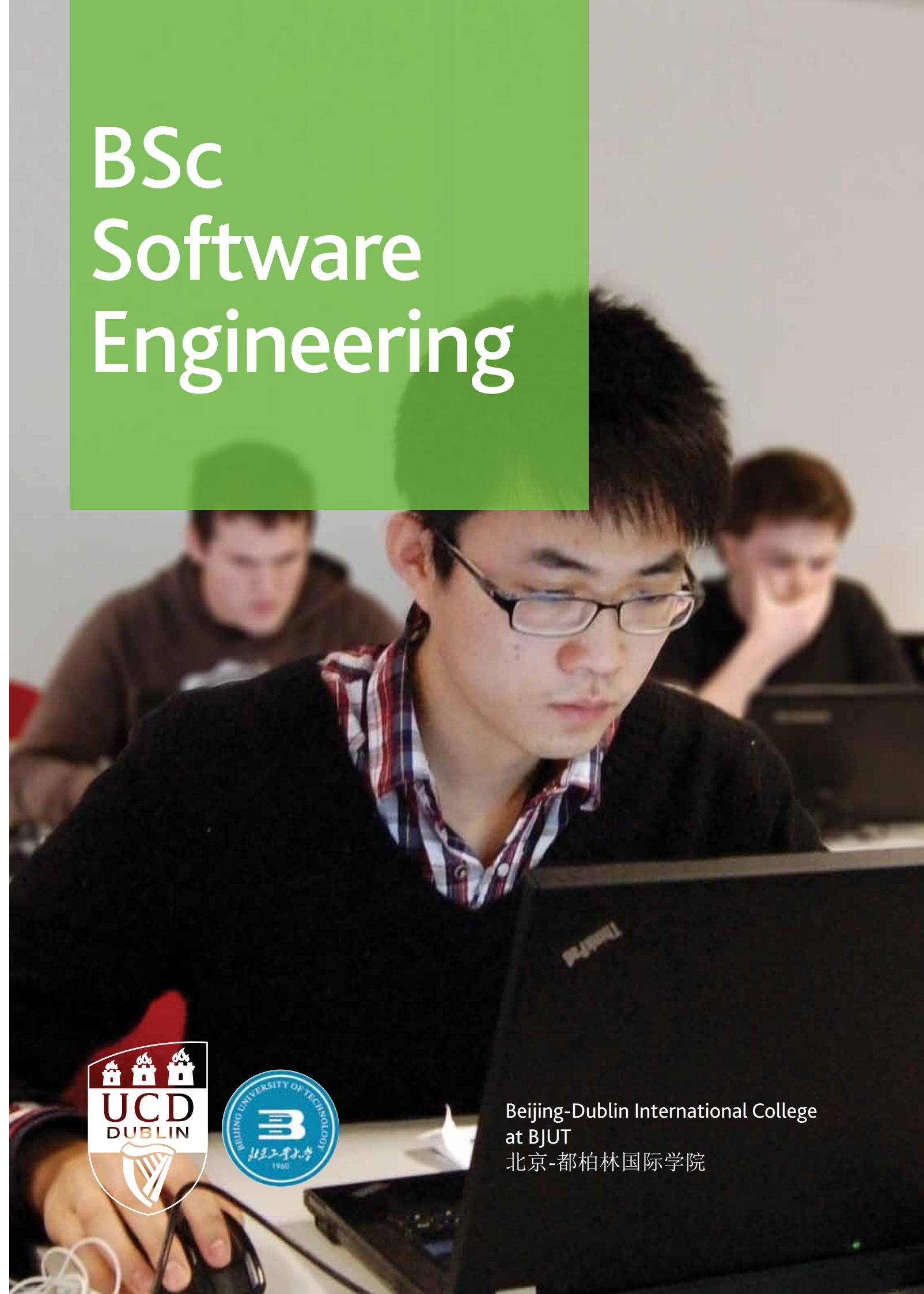# BSc Software Engineering

Academic Profile

Professor Joe Carthy
Dean of Science
Principal, College of Science

Professor Joe Carthy is currently the College Principal & Dean of Science. He has been a lecturer in Computer Science at UCD since 1984. He is active in three research areas: Information Retrieval; Data Mining; and most recently Cybercrime Investigation and Forensic Computing.

Professor Carthy is Director of the Centre for Cybercrime Investigation in the UCD School of Computer Science and Informatics and was appointed the Programme Manager for the AGIS Cybercrime Training programme involving twenty EU police forces – this is the first time that a non-senior police officer has held such a role. He also participates in the Interpol and Eurpol fora for Cybercrime Investigation. He has supervised/co-supervised 25 postgraduates (7 PhD and 18 MSc by research) to completion. He has been awarded over €1.8 million in research funding over the past 8 years, (as PI, joint PI and collaborator).

Beijing-Dublin International College at BJUT
北京-都柏林国际学院

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Why is this programme for me?

The software industry is a primary focus of national economic development and is key for the creation of "high-tech" industry in China. Software Engineering professionals are in high demand, not only in Beijing, but across China and globally.

This course is delivered by a strong teaching team who have rich experience in education. The course is based on successful courses already delivered by the National Demonstration College of Software combined with the experience of UCD, in producing top-quality software engineers. The course has a strong international focus, aimed at promoting internationalisation and enhancing the quality of software engineering training in China.

Graduates from the programme will not only acquire specialised Software Engineering knowledge but will also gain an international perspective and become familiar with international rules, international affairs and international competition.

What will I study?

Programme Structure
The curriculum will be delivered by a combination of lectures, laboratory exercises, tutorials/seminars and project work.

The programme starts with a strong foundation in Mathematics and an introduction to Computer Science in the first year, and continues with an introduction to programming and more detailed Computer Science in the second year. In the third and fourth years, core modules in programming, software development and software engineering techniques are given. The emphasis of the students' training is that they are equipped with a solid theoretical foundation, systematic professional knowledge and strong practical skills in the field of software engineering that will equip them for a successful career in industry.

Core modules include:
• Computer programming, software engineering techniques
• Theory of algorithms, data structures and algorithms
• Object-oriented programming
• Dynamic programming
• Digital systems, communications and computer networks
• Database theory, operating systems, distributed systems
• Theory of computer science, discrete mathematics

• Software engineering methodologies
• UML modelling, design patterns, software re-structuring, agile processes
• Agent software engineering
• Web application development, mobile computing
• Software project management, system testing and quality assurance, software deployment
• Performance evaluation of computer systems

Programme Objective

This degree programme aims to equip you with solid theoretical foundations, state of the art professional knowledge and strong practical skills in the field of Software Engineering. The programme sets out to provide you with:
• A thorough knowledge of Computer Science
• A solid foundation in programming and software development
• Strong skills in software engineering techniques
• Development of problem-solving and critical analysis skills
• Experience with software applications and computer and communications infrastructure

Assessment

Students will be assessed using a wide variety of assessment techniques. Assessment will vary between modules. Modules may be assessed through a combination of coursework and formal exams. Coursework may include case study projects, individual and group projects/assignments, written essays and individual or group presentations.

How will I benefit?

This degree programme has a wide technical range, and will provide you with a solid basis in programming and software engineering techniques. You will gain experience in programming using a variety of programming paradigms and in a number of programming languages. You will be introduced to state-of-the-art techniques in Software Engineering. This will be underpinned by a strong theoretical foundation in Mathematics and the Theory of Computer Science. You will also take courses on computer hardware, including communications systems and the design of digital systems. You will also cover a number of application areas, including database and information systems and operating systems. A key component of all courses is the development of problem-solving skills. Practical skills are developed through laboratory and project work.

All core modules of this programme are taught in English, and the majority of them are given by academic staff from UCD who are often experts in the relevant research areas. You will graduate with degrees from both BJUT and UCD, both of which are recognised around the world.

Career Opportunities and Prospective Employers

With the broad range of skills you will acquire from this degree, you will have excellent career prospects in programming and software development and in large-scale software engineering both in China and internationally.

With the rapid development of the IT sector in China, graduates from this degree will find excellent career opportunities in various companies, from large multinationals, such as IBM, Microsoft, SAP and Ericsson, to small and medium-sized companies. Graduates from this degree can also move into project management in the IT sector.

Further Study

The international nature of this degree also enhances the opportunities for graduates who may want to pursue further advanced education. After completion of this programme students may wish to attend UCD to pursue a postgraduate programme in areas such as Computer Science, Software Engineering, Digital Investigation, Cognitive Science and Simulation Science.

Many graduates may then continue to PhD studies in diverse areas such as Artificial Science, Cybercrime Investigation, Data Mining, Forensic Computing, Information Retrieval, Knowledge Discovery, Language and Cognition, Networks and Distributed Systems and Software and Systems Engineering.

Being taught in English will provide you with a distinct advantage in applying to PhD programmes overseas, for example in the USA, Canada, UK and Australia.

Application

Applicants will be reviewed on basis of academic merit and English language proficiency. Years 1 and 2 will include 50% more English language tuition than currently required by the Chinese educational system. There will be significant competition for programme places. Applicants should obtain the first division line in Gaokao.

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