

## Module Outlines :: Elective Subjects

### Mobile Computing :: 7 credits

**Aim:** To give the student a critical understanding of the issues and opportunities in the Mobile Computing arena. The module content will focus on current research (rather than established infrastructure) for the design, development and deployment of mobile technologies, thereby adding depth to the MSc in Computing.

It will expose students to areas that are rich in opportunities for further research and enterprise development. There are synergies with the mandatory HCI module which takes into account user interface design issues for mobile computing and with the Distributed Computing module which explores new and emerging distributed computing paradigms.

### High Performance Computing :: 7 credits

**Aim:** To introduce the concepts of HPC, provide students with the skills required to assess and exploit HPC architectures and to establish a critical awareness of the opportunities and challenges presented by parallel computing architectures.

This module requires the application of knowledge, problem solving and understanding in a new and unfamiliar context, thereby adding depth to the MSc in Computing programme. It provides a theoretical grounding in a specialised area which opens up opportunities for further research.

### Project Management :: 7 credits

**Aim:** To provide students with the skills required to lead and manage a software development project from start to finish.

Using real world case studies and project simulations of complex projects, this module will provide students with core project management skills across all areas of project management (time, cost, scope, risk, quality, communications, human resources etc). It will focus on developing team leadership and human resource management skills, and instill in students core competencies in managing change in organizations. The importance of project communications and its role in change management will be stressed throughout the assessment strategies.

### Visualisation :: 7 credits

**Aim:** To provide students with the advanced level of theoretical knowledge and practical skills needed to create realistic and informative visual representations of complex phenomena and data in such application areas as scientific and engineering visualization, and computer simulation and games.

By building on the broad knowledge students will have gained at undergraduate level in subjects such as computer graphics and mathematics, the module adds depth to the MSc in Computing, by providing a theoretical basis for complex topics. It enables the student to develop the capability to research topics particularly in the areas of data representation and procedural methods for computer visualization.

### Enterprise Information Architectures :: 7 credits

**Aim:** To provide students with expert conceptual knowledge of existing and emerging enterprise information architectures. To equip students with the practical skills to design and evaluate modern enterprise distributed architectures and topologies. Understand the major business issues confronting data centre management and their current and proposed solutions and practices

This module offers a comprehensive examination of modern networked information architectures paradigms and the latest practices and trends relating to the management of large enterprise data centres.

### Document Engineering :: 7 credits

**Aim:** To develop a deep and critical understanding of current and emerging concepts, best practices and problems in the area of document engineering in the context of knowledge management and to develop a systematic understanding of applying current concepts, techniques and skills to document production and evaluation.

The design, creation, distribution and transformation of documents is central to the information society. This module builds on the established principles of information storage and retrieval, through XML and its ability to define formal structural and semantic components of electronic documents. This module provides a bridge for the integration of a variety of concepts a student may have encountered at undergraduate level (databases, object oriented design and development, and web development).



# MSc in Computing

*Institute of Technology Tralee in partnership with Dundalk Institute of Technology*

The MSc in Computing has been developed by IT Tralee and Dundalk IT and is a unique programme in the Higher Education Sector in Ireland. Making the virtual classroom a reality, it is jointly delivered to students in both Institutes using the very latest in video conferencing and e-learning techniques.

The aim of the MSc in Computing is to produce graduates with an advanced level of theoretical knowledge and practice, with highly developed research capabilities, innovation and entrepreneurial skills to further their professional development in the IT industry. On completion of the programme, students will be subject area specialists in the modules covered in the MSc in Computing, including advanced software design, mobile computing, human computer interaction, distributed computing and others. Graduates will have excellent team leadership skills and change management skills, and will have the ability to systematically evaluate emerging technologies and trends from a business opportunity perspective. Research, innovation and entrepreneurial skills are key themes of the programme, reflecting the role of each of the participating Institutes as supporters of enterprise development and engines of growth in their region.

## PROGRAMME OUTLINE

### Mandatory

Software Process Management  
Software Design  
Entrepreneurship and Intrapreneurship  
Human Computer Interaction  
Distributed Computing  
Research Project  
Research Methods

### Electives (2 of the following)

High Performance Computing  
Project Management  
Mobile Computing  
Visualisation  
Document Engineering  
Enterprise Information Architectures

*\* Please note electives are offered subject to demand.*

## APPLICATION DETAILS

For further information please contact:

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## Graduate Profiles

*The MSc in Computing will add value to the competencies students bring with them to the programme, and we expect graduates of the programme to be able to perform the roles outlined below:*

**Senior Technical Architect/Developers** with the ability to analyse complex system requirements based on a comprehensive knowledge of current technologies and best of breed solutions; and the ability to design solutions and develop technical blueprints, detailed systems designs, and supporting documentation, which may include managing a technical team for the design, testing and implementation phases of a complex project.

**Team Leaders/Senior Managers** of complex software development processes in multinationals or SMEs, who are capable of evaluating the current process against best industry practice and leading the implementation of process improvements within their organisation (e.g. managing the migration to an Agile development process for a software development team).

**Project Managers** for complex IT processes or specialist products within a multinational or SME, capable of managing a project at all stages of the lifecycle, but with particular strengths at the project identification/feasibility assessment stage (e.g. a project manager for the introduction of grid computing platform in an SME).

**Research Project Managers or Senior Researchers** (in either industry or academia), capable of undertaking a significant piece of research of industrial relevance from concept phase to publication in peer reviewed journals.

**Entrepreneurs** who are capable of developing a technology-based idea into a full enterprise development opportunity.

## PROGRAMME LEARNING OUTCOMES

On completion of the programme, students will:

- Be regarded by their peers as subject area specialists in the modules covered in the MSc in Computing, and leaders in the field covered by their research project, with an advanced understanding of the changing knowledge base in these areas and an appreciation of how this equips them to offer leadership in the subject area.
- Have excellent team leadership skills with the ability to take responsibility for the work of individuals and groups, and have developed a high level of competence in initiating, leading and managing technology projects and processes including the ability to initiate and manage change in an organisation.
- Have the capacity to integrate advanced theoretical knowledge and solve complex problems in new, ill-defined or unfamiliar domains, and/or domains at the forefront of learning. Have the ability to systematically evaluate emerging technologies and trends from a business opportunity perspective.
- Have a profound respect for intellectual integrity and for the ethics of scholarship, and have highly developed research skills.
- Have the capacity to reflect on and evaluate his/her own performance, career and professional development.

## ENTRY REQUIREMENTS

Applicants who have a four years honours Bachelor's Degree, at a minimum level of Honours 2.2, in Computing or a related cognate field of study are eligible for entry to the programme. A Higher Diploma in Computing is available in ITT to graduates of non-computing courses. Graduates of the Higher Diploma in Computing may progress to the MSc in Computing.

## WHY CHOOSE IT TRALEE FOR YOUR STUDY?

- The campus of the Institute of Technology Tralee is shared with Kerry Technology Park, the flagship location for knowledge-based enterprise in Kerry, Ireland. Our students and graduates work with companies in the Technology park through work experience projects, research projects at postgraduate and undergraduate level, graduate placement, etc. (<http://www.ittralee.ie>). Many of the graduates of the MSc in Computing undertook their project work with KTP companies.
- In addition to working with the very latest technologies, in a real world environment which is closely linked to industry needs, we place considerable emphasis on developing the research skills and entrepreneurial skills of our graduates.
- The Msc in Computing is jointly delivered with Dundalk IT, in full-time and part-time mode, allowing students access to the researchers in both Institutes for their research projects. Research areas of the Institutes include: Mobile Computing, Mobile Learning, High Performance Computing, Grid Computing and web ontologies.
- Tralee is situated in one of the most beautiful regions in Ireland. Beaches and mountains are within easy reach, the standard of student accommodation available is one of the highest in Ireland. The cost of living in Tralee is lower than most other cities in Ireland and overall the quality of life in Tralee is second to none.

# Module Outlines :: Mandatory Subjects

### Human Computer Interaction :: 5 credits

**Aim:** To allow students to encounter new and emerging advanced interaction technologies and to challenge students to critically reflect on user interaction processes as they impact on the design and development of new products, applications and information services. By addressing topics in an open-ended way, and by drawing on the students own UI design and development experience, students will be encouraged to build a perspective on the area of HCI. The topics presented include leading edge research issues in the field.

### Research Methods & Professional Practice :: 3 credits

**Aim:** To provide students with the knowledge, skills and competencies required to manage a research project from the initial concept phase through to successful completion and publication of results. The module equips students with research skills necessary for the main Research Project of the MSc in Computing and will be of benefit to all other modules.

Students will be able to evaluate and design the most appropriate research methodology for use in a given context, a task which they would typically receive significant guidance and supervision for at undergraduate level. The assessment strategies for this module are closely integrated with other modules in this stream.

### Entrepreneurship & Intrapreneurship :: 5 credits

**Aim:** To develop a deep understanding of the concept of Entrepreneurship and Intrapreneurship with the context of innovation, management and business plan development and to develop a conceptual awareness of techniques and skills to apply current approaches to business plan development in the ICT sector.

The inclusion of this module supports the recommendations of many national reports that are repeatedly calling for the development of entrepreneurial skills in ICT graduates. It provides a bridge from the research skills developed in other areas of the programme to enterprise development both within a company and for start up companies, providing students with a holistic view of the development of new concepts.

### Software Process Management :: 7 credits

**Aim:** To prepare the student for managing and measuring the development of software products and associated activities. Software Process Management module will equip students with the knowledge, skills and competencies to enable them to manage complex software development processes

### Distributed Computing :: 7 credits

**Aim:** To provide students with expert knowledge of existing and emerging distributed computing paradigms and practices. The student will acquire the knowledge, skills and competencies to critically evaluate and implement modern distributed computing paradigms and emerging technologies.

This aim is supported through course material that integrates formal distributed systems theory with modern best-practice software development techniques. The theoretical knowledge gained is reinforced by a continuous assessment strategy focused on the individual application of rigorous research, development and analysis techniques.

### Research Project :: 14 credits

**Aim:** To allow students to draw on the reflective insights and skills imparted by the MSc in Computing to carry out a systematic and comprehensive body of research in a relevant technological area.

The research project will typically focus on one subject area covered within the MSc in Computing and ideally will be aligned with the research interests of the staff involved in the programme, or in an area of particular interest to the student in the context of their work environment. The topic of the research project will form the basis of the development of a business plan in the Entrepreneurship module.

### Software Design :: 5 credits

**Aim:** To give students an expert conceptual knowledge of techniques for software design, to enable students to apply advanced software design techniques and to allow students to investigate new and emerging topics in the area of software design.

This module addresses advanced design techniques within the object-oriented paradigm as well as evaluating emerging technologies and practices in the area. It focuses on the application of software patterns, anti-patterns and emerging areas such as Aspect Oriented Programming.