



# ENGINEERING

The School of Engineering is one of six academic schools within Waterford Institute of Technology and comprises the departments of Architecture, Engineering Technology, Construction & Civil Engineering and Trade Studies. There are over 100 faculty members in the school serving some 1100 full time students and 750 part-time craft apprentices.

The Engineering School is committed to the pursuit of the best practice in learning and teaching across the wide range of disciplines in the school and to the development of innovative part-time programmes that will serve the needs of practicing professionals in Irish industry.

For the past decade the school has been pursuing a strong research agenda linked to local and regional industries. Undergraduate project work is grounded in real life problems experienced by companies with which the school staff has contacts while postgraduate work, both in taught and research programmes is growing and is recognised as vital to the school's future development.

Well qualified staff and the student centred approach to education that permeates the school makes for an enjoyable student experience, while the facilities of a modern campus and the resources of the city and the south-east region all serve to meet the social and developmental needs of our students.

## CONTACTS

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*“Postgraduate study is a life changing experience, shared with a number of like-minded individuals, interested in challenging our learning boundaries and reaping the benefits of our individual commitment.”*

**Fiona McHardy, MSc in Construction Project Management**



## RESEARCH GROUPS/CENTRES

### Materials Characterisation Processing Group

Dr. John O’Dwyer      E: jodwyer@wit.ie

### South Eastern Applied Materials Research Centre - SEAM

Dr. Ramesh Raghavendra      E: rraghavendra@wit.ie

### Wireless Communications & Large Scale Simulation Group

Dr. Paul O’Leary      E: poleary@wit.ie

### Nanotechnology Research Group

Dr. Joe O’Mahony      E: jomahony@wit.ie

### Advanced Automotive Electronics Control Group

Mr. Henry Acheson      E: hacheson@wit.ie

Mr. John Manning      E: jmanning@wit.ie

### Advanced Manufacturing Technology Research Group

Mr. Joe Phelan      E: jphelan@wit.ie

### Microelectronics & Systems Research Group

Mr. Ken Deevy      E: kdeevy@wit.ie

### Construction Industry Research & Knowledge Group - CIRK

Dr. Ken Thomas      E: kthomas@wit.ie

## FURTHER RESEARCH AREAS/TOPICS

### Nanopositioning & Nanomeasurement

Mr. Joe Phelan      E: jphelan@wit.ie

### Semiconductor and Solid State Research

Mr. Philip Walsh      E: prwalsh@wit.ie



## Materials Characterisation & Processing Group - MCP and South Eastern Applied Materials Research Centre - SEAM

The Materials Characterisation and Processing Group (MCP) is a transdisciplinary research group and currently involves academic staff from the Schools of Engineering and Science at the Institute. The Group has secured funding to establish the South Eastern Applied Materials Research Centre (SEAM) under the Enterprise Ireland Applied Research Enhancement programme. The combined MCP Group and SEAM Research Centre, is now one of the established research clusters at the Institute. Their strategy is to create a strong applied research base by promoting and establishing industry-academic collaborations.

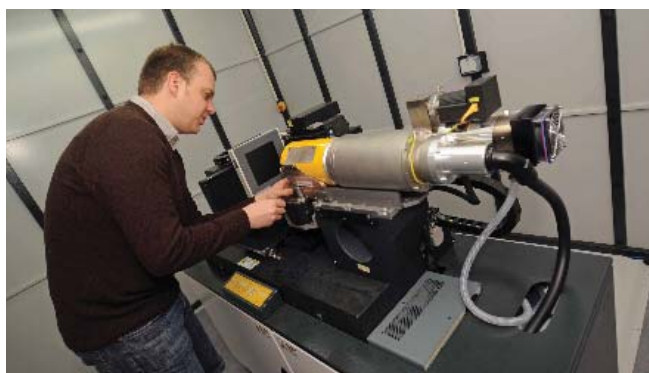
The MCP Group has been engaged in National, EC-funded and other International collaborative research in the following areas.

- Bulk Metallic Glass Composites
- Nanostructured Materials
- Metallic Foams
- X-ray Microtomography
- Polymer Composites
- Microwave Processing and Remediation
- Structural Health Monitoring of Polymeric Composites
- Magnetically Targeted Nanoparticles

These research activities are expected to make a useful contribution to key industrial sectors including medical devices, pharmaceutical, healthcare, and waste remediation.

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## Wireless Communications & Large Scale Simulation Group

This research group was formed in 2002 with the aim of researching into the Radio Frequency (RF) air interface with a particular emphasis upon the measurement and simulation of the characteristics of the wireless communications' channel for cellular, indoor and satellite wireless communications. Research carried out primarily includes applied research for innovation in modulation, coding and related embedded processing. Recent innovations in the electronic system-on-chip (SOC) area, which combined Radio Frequency (RF) capability with the SOCs, are also being exploited. This permits extensive research in wireless sensing and control.

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## Nanotechnology Research Group

This Nanotechnology Research Group offers state-of-the-art laboratory facilities located within the Pharmaceutical and Molecular Biology Research Centre (PMBRC) and the School of Engineering. The group provides an interdisciplinary research environment for graduates of Engineering and Science.

### Our main research topics are:

- Organic Electronics
- Solar Power Generation
- Sensor Technologies
- Scanning Probe Microscopy Techniques
- Low Light Level Spectroscopy
- Thin Films

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## Advanced Automotive Electronic Control Group

The Advanced Automotive Electronic Control Group was established in 2000 at Waterford Institute of Technology to carry out research, consultancy and training in software and electronic systems applicable to automotive applications. The group's three principal researchers bring together complementary skills from the automotive and electronic areas. The group aims to provide researchers with the practical skills that will enable them to secure employment as research and development engineers in the automotive industry and to provide a consultancy service to companies in the automotive area. The group has recently been involved in a project to conduct a general test on the usability and safety of the New T0105 System 05 satellite navigation system as it appears on a compact SUV (sport utility Vehicle). This project was initiated by an Italian company DHS Milan and involved 27 researchers in 6 countries including Ireland (WIT, TCD and UL), Japan (NIME), Finland (UIH), Italy (Politech University in Milan).

The group members have provided training courses on Automotive Networks (CAN, LIN, MOST, FLEXRAY) and Automotive Diagnostics (EOBD, OBDI, OBDII) to the Automotive Industry and to other Educational Institutions. We also develop automotive training products and test equipment.

### The group has a number of ongoing projects that include:

- Investigation of vehicle inter network gateways
- Vehicle Climate Controller Strategy
- Vehicle Telematic Safety and Optimisation
- Vision technology

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## Advanced Manufacturing Technology Group

Research in the AMT area is carried out at Masters and PhD level. Arising out of active links with Industry funding has come through partnerships with local and national industry as well as through the national competitive research grant system. The AMT Research Group is the longest established research grouping in WIT and has a long list of successes in terms of graduates, funding and sustainable technical development.

The AMT research focus in the past has been in the general area of Automated Systems and specifically the following: Automation; FMS/FMAS & ASRS; Manufacturing Process Development; Component Feeding. Flexibility and low cost production through automation were key objectives of this work and real skills have been developed in this area.

Over the past six years the above Automation research focus has been towards the area of precision engineering with current specific interests in the following:

- ultra precision location and measurement; low cost solutions for the precision industry.
- piezo based micro/nano systems: instrument/system design; development and implementation for positioning and measurement.
- micro/nano level feeding, gripping; flexible assembly of complex precision devices.

Exciting applications are being found in local manufacturing and toolmaking industry and in the medical device industry.

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*"A Research Masters has more flexibility than following a set syllabus in a taught postgraduate course. It lets me concentrate on the areas that are of particular interest to me and pick up skills which will be appropriate to the area I plan on working in. During my postgraduate research I have expanded on many skills learned in my degree and learned many more. Postgraduate Study has certainly been a challenge, but I really enjoy the work I am doing."*

**Brian Somers, Masters by Research in Engineering**

## Microelectronics & Systems Research Group

The Microelectronics & Systems Research Group (MSR) was established in 1996 at the Waterford Institute of Technology under the leadership of Ken Deevy. The main activity of the group is the research and design of signal conditioning electronics, programmable mixed signal systems and precision sensor interface design. The group also specialises in the design of custom ASIC solutions for niche applications. Emphasis is on the solution to real world signal processing problems employing programmable system-on-chip technology. The group has significant experience in the areas of data conversion, analogue signal processing and capacitance touch and proximity sensor design.

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## Construction Industry Research & Knowledge - CIRK

A key driver in the development of disciplines in the construction industry in the coming years will be the creation and distribution of knowledge. Research relevant to the Irish construction industry has been limited to date, particularly in relation to people, processes and technology.

The Department of Construction & Civil Engineering at WIT established the CIRK Centre in 2005 and this is the focal point for WIT research activities relevant to stakeholders in the current and future Irish construction industry and the retention of related knowledge.

Much of this research has to date been carried out in partnership with other national/ international education and research organisations. Our strong links with professional organisations and industry have also been utilised in the course of our research work.

Research proposals are invited from individuals and organisations that have an interest in improving the Irish construction industry, particularly in relation to the following topics:

- The use of current and emerging Information and Communications Technologies (ICTs) in the construction industry
- E-Learning for the construction industry
- Knowledge Management in the construction industry

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