

What's Next?

Instrument Engineering

Bachelor of Science (Honours)
in Instrument Engineering

Instrument engineers combine skills from a scientific and engineering perspective to become experts in measurement and analysis of data typically in advanced manufacturing sectors, such as BioPharma and Chemical industries, smart product manufacturing, IT hardware development, etc.

Instrument Engineers understand the fundamental principles of measurement and calibration using advanced scientific instruments, usually in a smart manufacturing environment. As an Instrument Engineer, you will be responsible for planning, installing, monitoring and maintaining control systems and machinery within advanced and traditional manufacturing environments. As instrument engineers work with control processes, you also may work in the design and development of new instrument-based products.

As a graduate, you will contribute significantly to the quality, safety and productivity of operating systems.

Core Skills



Transferable Skills

- Measurement and Analysis
- Critical thinking & problem solving
- Logical & mathematical reasoning
- Communications
- Leadership & teamwork
- Research, laboratory/ experimentation skills
- Data analysis and report writing
- Ethics & Professionalism.



Degree-specific Skills

- Knowledge and understanding of theory, concepts and methods that apply to specialised areas of applied physics and instrumentation, and of relevant design standards and best practice.
- Design, develop and implement measurement and control systems.
- Manage, evaluate and critically analyse complex instrumentation and process control installations.
- Specific knowledge and understanding of process industries, related service suppliers and system integrators.
- Specify and use appropriate methodologies, technologies and skills to solve a range of problems in instrument engineering
- Manage continuous professional development.

Career Options



Instrument engineers work in a variety of industrial facilities that specialize in manufacturing, including the processing of food or chemicals, or in the utilities sector, such as oil and gas production, energy, including renewable, and water quality analysis. Design and development of new products that use sensors, such as medical device instruments or fire and safety detectors, is another career option, as is working in an engineering consultancy.

Instrument engineers are often involved in ensuring that the company meets statutory requirements, for example in **calibrating, managing and monitoring the instruments** used to measure emissions.



While the specific tasks of an instrument engineering job will depend on the control systems involved and the product being produced, **duties may include:**

- Installing new control processes
- Daily monitoring of sensor outputs and process operation
- Working with others to design and develop new control processes
- Developing testing protocols
- Ensuring instrumentation operation complies with quality parameters
- Carrying out routine maintenance
- Troubleshooting issues
- Optimising processes to improve system efficiency
- Data collection, analysis and report writing.

Employers



Manufacturing, chemical, and other industries with automated processes hire instrument engineers to optimize dependability, efficiency and productivity within their sites. **Employers of instrument engineers include:**

- Food and beverage processing plants (e.g. PepsiCo, Dairygold)
- Pharmaceuticals (e.g. Pfizer, MSD, Sanmina)
- Bio-technology and chemical processing plants (e.g. Regeneron, Janssen, Lilly)
- Other manufacturing /product development companies (e.g. ABEC, Alcon)
- Oil and gas refineries (e.g. Irving Oil)
- IT hardware manufacturing sites (e.g. Intel, Analog)
- Energy and water companies (e.g. Ervia, EPS)
- Aerospace (e.g. ESA ESTEC)
- BioMedical (Stryker, DePuy).

For further details, see the department of Physical Sciences website:

<https://physicalsciences.cit.ie/careers>

Watch out for talks by relevant employers on campus during the year to get insights into companies and the engineering roles on offer, check the Careers website's Jobs page and follow us on social media for regular job alerts:

<http://www.mycit.ie/careers>.



Starting Your Job Search

Job search takes focus, effort and commitment. It's essential that you create a strong online presence. You need to have a LinkedIn profile and work at building up your network. Be sure to include a link to your profile on your CV. We recommend that you visit a CIT Careers Advisor to get feedback and advice on your LinkedIn profile.

Search for companies/industries that interest you and aim to find a contact name on LinkedIn, for example, look for CIT Alumni (former graduates of your course and other engineering degrees) and ask them to connect with you. Follow people who are where you want to go, look back at their career journey and make connections! Don't wait for jobs to be advertised, actively work at presenting yourself for roles that interest you.

Graduate programmes are paid jobs and a good career starting point. Often you get to rotate to different departments or sites, which gives you varied work experience in a short time. Register with GradIreland:

www.gradireland.com

Enterprise Ireland and the IDA (Industrial Development Agency) have lists of the companies, including multi-national companies in Ireland, and many employ instrument engineers. See: **<https://www.enterprise-ireland.com/en/Source-a-Product-or-Service-from-Ireland/Sector-and-Company-Directories/>** and **www.idaireland.com**



Where are CIT graduates working?

Company

Hanley Calibration
Janssen Biologics
Zenith Technologies
Qualcomm
Defence Forces
Irish Naval Service
SensL Technologies
DELL
Innovative Total Solutions and Cobots.ie
Irving Oil
ONT Automation
Zenith Technologies
Irish Defence Forces Naval Service
Naval Service
Rockwell Automation

Job Role

Instrument Technician
Maintenance Technician
Graduate Automation Engineer
Engineer
IT Analyst
Naval Service Programmer
Product Engineer
Manufacturing Engineer
Application Engineer, Trainer and Technical Support Engineer
Graduate Engineer
Automation Engineer
Automation Engineer
Radio Technician
IT Technician
Graduate Automation Engineer

Professional Groups & Associations



Membership of a professional body is a useful way to meet new people in your field and will look good on your CV. Many professional bodies have jobs boards and these roles may not be advertised elsewhere. Relevant professional bodies include:

International Society of Automation: The Department of Physical Sciences works closely with the ISA and students are encouraged to join the association during their time in college. The ISA is a global network that offers major opportunities to meet professionals across a range of industry sectors. Students can participate in the ISA World Student Games (usually in Canada) and the ISA has an annual awards ceremony in Cork to recognise students and outstanding performance professionals nationally. Our students are frequently recognised at these awards. <https://www.isa.ie/>

Institute of Physics (IOP) in Ireland recognises your CIT honours degree and upon graduation you can apply for Associate Membership. IOP offers a range of professional development opportunities, which will contribute to your longer-term career success. IOP also has a Career Development Hub, an online resource to support members' career development. <http://www.iopireland.org/>

Engineers Ireland: The BEng (honours) in Instrument Engineering is fully accredited by Engineers Ireland for membership eligibility. It also runs programmes for graduates, such as, the **Future Professionals Programme** for graduates in their first job and includes mentoring. This graduate transition programme is run with employers and is accredited by TU Dublin.

Two additional professional bodies to investigate are:

- Institution of Engineering and Technology (IET)
- Institute of Measurement and Control (InstMC).

