



LIT

FACULTY OF APPLIED SCIENCE,
ENGINEERING AND TECHNOLOGY



LIT

DEPARTMENT OF MECHANICAL
AND AUTOMOBILE ENGINEERING

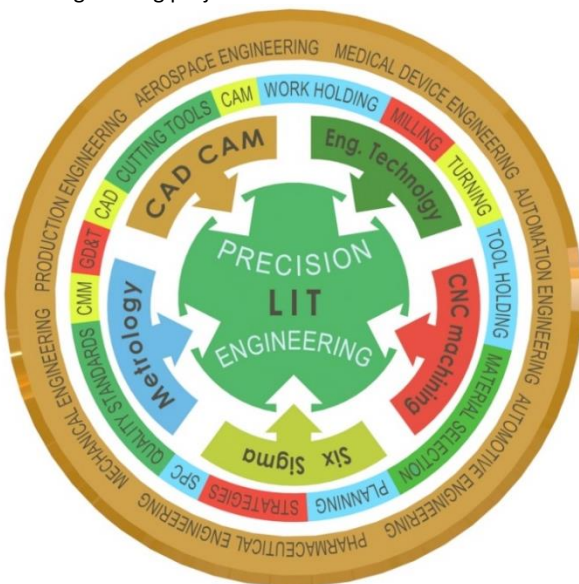
PRECISION ENGINEERING

HIGHER CERTIFICATE in PRECISION ENGINEERING – LEVEL 6

What is the programme about?

Precision Engineering is the manufacture of parts and assemblies of part with high tolerances to specific dimension utilising highly accurate machines. This Level 6 higher certificate in Precision Engineering has been designed with industry to respond to the needs of the Precision Engineering industry for skilled, knowledgeable and competent technicians and engineers.

At the core of this programme is the Industry need to have graduates capable of becoming highly trained and educated CNC programmers, machine setters and operators in world class manufacturing industries. This is a workshop/lab based programme with hands-on experience on state-of-the-art CNC machines, CAM software and metrology equipment. Students will learn the theory, maths and science aspects of engineering to support their practical work. Students will work as individuals and in groups on a variety of industrial standard engineering projects.



This programme can be completed in two years full time. First year of the programme is offered on a full time basis but second year may be taken either full time or part-time by taking two years to complete one academic year while working part-time. Programme graduates will work as highly skilled technicians in world class manufacturing environments and will be highly skilled in areas of CNC machining, CAD/CAM, and metrology. Students will be able to progress to the Level 7 add-on Precision Engineering programme within LIT or other programmes in a similar cognate area.

What will I be able to do when I finish the programme?

A person who has completed this programme will be able to:

- Create CNC programme using manual G-coding and CAM
- Create 3D models of components using CAD
- Manufacture precision components and assemblies using world class equipment
- Interpret engineering drawings and carry out model based inspection of components
- Measure components accurately and compare with drawings
- Drive process improvements/capacity increases through new technology / equipment selection and specification.
- Work with engineers and designers to manufacture components to the highest standards.

Features of the programme

- **Programme flexibility** to work and learn; Year 2 can be undertaken full time or part-time over two years
- Develops a deep knowledge of Engineering, design and manufacture through the utilisation of **modern technology**
- Developed in **conjunction with world class companies** in response to a shortage in highly skilled qualified technicians
- High practical content in **CNC Machining, CAD/CAM, Metrology, Materials and Six Sigma.**
- **Uses industrial equipment** to solve real industrial problems
- Builds up students' knowledge and ability in world class engineering
- Facilitates **progression** to Level 7 programmes within LIT and other colleges/universities

Year 1 Programme Modules

1. Engineering Technology

Safety, material, material removal processes, workshop metrology processes, machine tools, NC control, assembly

2. Engineering Computing

MS Word, MS Excel, MS PowerPoint, MS Project, report writing, presentations

3. Introduction to Mechanical Engineering Maths

Basics, Formulae, Algebra, Graphs, Logs and exponentials, geometry and trigonometry, statistics, calculus

4. Mechanical Engineering Science

Heat, Forces and moments, Dynamics, Friction and lubricants materials simple machines.

5. CAD and Design

Engineering design methods, pictorial drawing, orthographic projection, plane geometry, developments, CAD

6. Introduction to CNC Programming and Operation

Safety and quality standards, tolerances and datums, CNC machines, control feedback, programming – lathe and mill, cutter compensation.

Year 2 Programme Modules

1. Engineering Technology and Maintenance

Safety, materials, material removal processes, metrology, modern machining techniques, forming, manufacturing systems, power transmission systems, maintenance

2. Mechanical Engineering Maths and Programming

Trigonometry, differentiation, integration, series, matrices, complex numbers, statistics, programming, macros, looping

3. CAD and Design

Parametric Solid Modelling, group project, systematic design, jigs and fixtures, standard parts, rapid prototyping

4. Industrial Machine Mechanics Engineering Computing

Stress and strain, friction, statics, dynamics, kinematics of machinery, balance of machinery, vibration analysis.

5. Introduction to Six Sigma and Metrology

Safety and quality standards, metrology principles, measuring instruments, thread measurement, introduction to Six Sigma, Project management, GD&T, CMM, VMM, Statistics

6. Advanced CNC programming (CAM), setting & operation

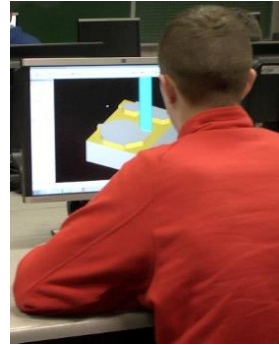
Introduction to CAM software, 2.5D milling – integrated and standalone CAM software. 3D surface machining, turning – integrated and standalone CAM software, inspection



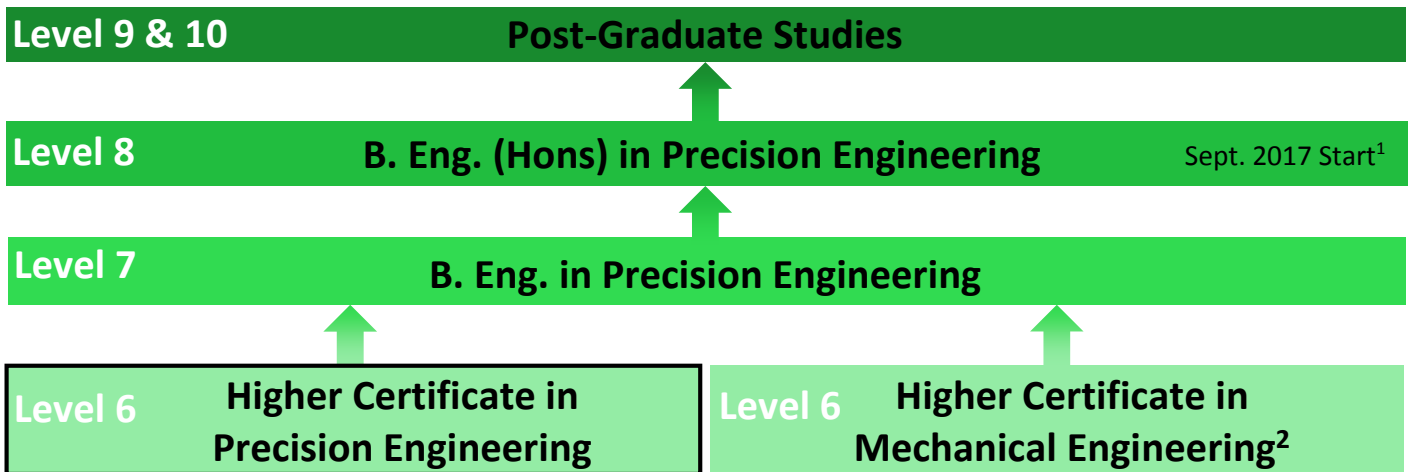
Employment opportunities

Graduates will typically be employed in one of the following roles:

- Precision engineering technician in a world class machining environment
- CAD/CAM Technician/programmer in design and interpreting technical drawings.
- CNC machinist, programmer and setter for both milling and turning on 3, 4 and 5 axis machine tools.
- CMM programmer and operator, Six sigma and Statistical process control
- Driving process improvements/capacity increases through new technology/equipment introductions.
- Equipment test engineer/technician in a variety of technological role.
- Process technician in the medical device, human implant, and Life Sciences Industries



Course Progression Ladder



Notes:

1. Subject to approval.
2. Additional requirements may be necessary for entry to Level 7 in Precision Engineering, see minimum entry requirements section below.

For application details contact:

Admissions Office:
 Limerick Institute of Technology,
 Tel: (061) 293262
admissions@lit.ie
<http://www.lit.ie/Admissions/default.aspx>

Minimum Entry Requirements

Leaving Certificate: A minimum of 5 Passes in Leaving Certificate subjects, including Mathematics and English/Irish. Candidates applying as mature applicants will be required to attend an interview and may be requested to take an aptitude test to prove their suitability for a place on this programme.

Level 6 Craft Certificate (trade) such as Fitting or Toolmaking
 Candidates who hold a Senior Trade Certificate and/or National Craft Certificate with appropriate endorsements or examination attainments in a cognate area will also be considered for entry, subject to a satisfactory interview.

Where a candidate does not have sufficient/appropriate prior learning experience in these areas, entry to the Level 6 Higher Certificate in Precision Engineering can still be granted based on agreement to undertake additional night class modules to attain the standards required. For example, LIT offers the following night class programmes: (<http://www.lit.ie/Prospectus/FLProspectus/default.aspx>)

- CAD: City and Guilds Award in CAD Parametric Modelling (SolidWorks)
- Engineering Mathematics and Science: City and Guilds Advanced Diploma in Engineering
- Engineering Technology: City and Guilds Technician Diploma in Engineering
- CNC: CNC Machining, City and Guilds

Contact Information

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