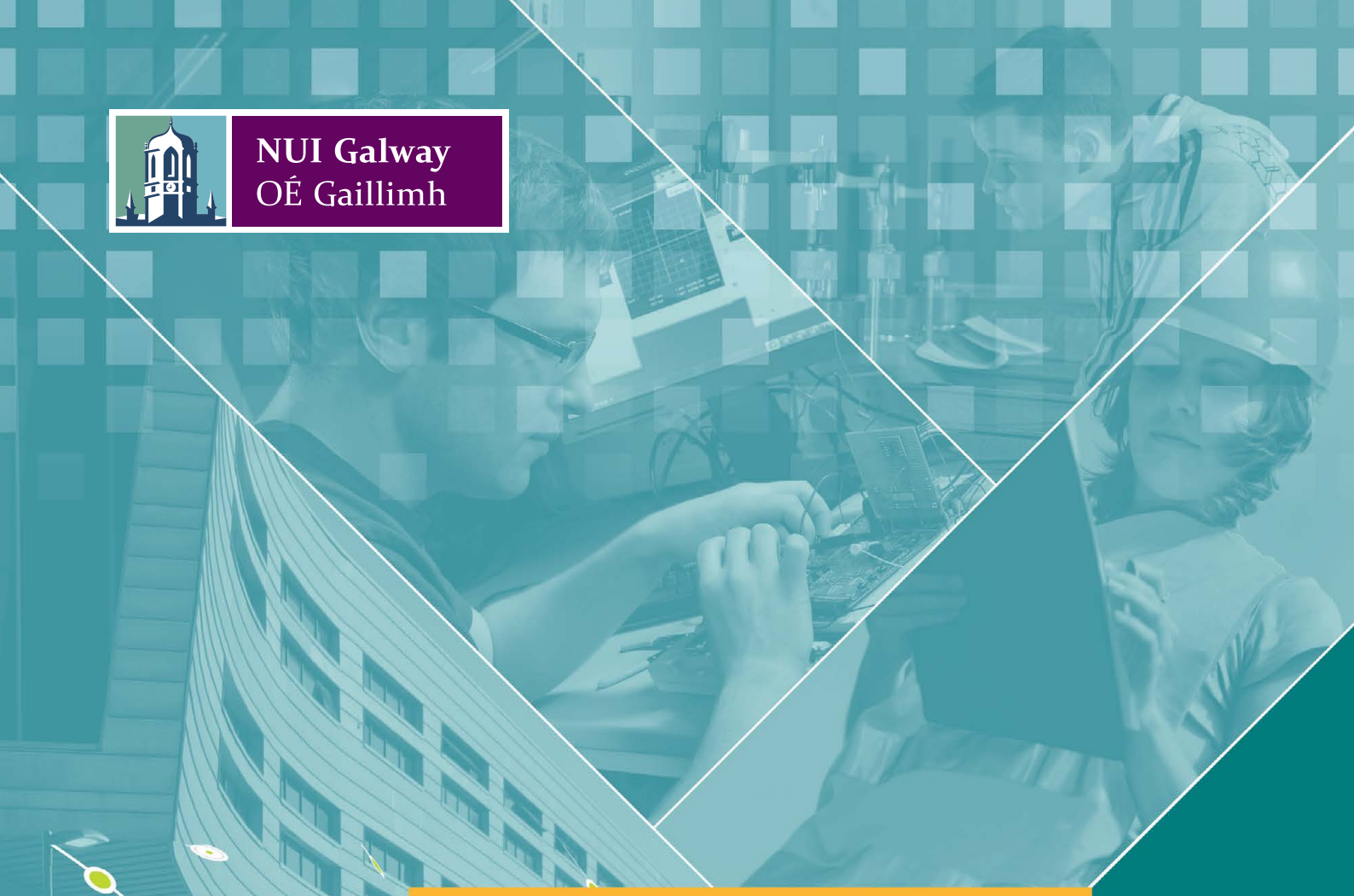
NUI Galway
OÉ Gaillimh



Engineering and Informatics at NUI Galway

Undergraduate Programmes

www.nuigalway.ie/engineering-informatics

contents

WELCOME TO NUI GALWAY

ENGINEERING

COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

Courses and Course Content are subject to change.

Engineering and Informatics

Be Inspired

When choosing an undergraduate qualification it is critical that you choose one that will engage, challenge and provide you with international employment opportunities. The College of Engineering and Informatics provides skills and knowledge that enable our creative and talented students reach their full potential. A degree qualification from the College of Engineering and Informatics, accredited by Engineers Ireland, helps you to distinguish yourself in a competitive job market. It also enables you to develop the specialist skills you need to succeed in your chosen field. Our undergraduate programmes are recognised internationally, with our graduates securing employment soon after completing their programme in many of the world's leading companies. We work with industry to ensure that our programmes produce graduates who are highly skilled and trained to address the problems society face.

World-leading research drives teaching forward at the College of Engineering and Informatics. Your learning experience is enhanced by this spirit of enquiry, as you are taught by academics who bring the latest ideas and discoveries into the lecture theatre. We are committed to delivering top quality teaching for our students. Our Centre for Excellence in Teaching and Learning enables lecturers to keep up to date with their teaching practices. Blackboard, our Virtual Learning Environment, is extremely popular with students, who find that it enhances their learning experience and gives them access to more learning resources. Your lecturers are recognised experts in specific fields such as renewable energy, biomedical engineering, information and communications technology, mechanical engineering, civil and structural engineering, electrical and electronic engineering, among others, which makes NUI Galway the first choice for anyone interested in Engineering or Computer Science and Information Technology programmes.

We look forward to welcoming you to the College of Engineering and Informatics where you will be at the forefront of developments in Engineering and Computer Science and Information Technology education.

Professor Peter McHugh
Dean, College of Engineering and Informatics
NUI Galway

your on campus learning experience

The provision of an exceptional learning experience is central to life at NUI Galway. Purpose-designed buildings and environments are combined with the most modern research facilities to provide a wonderful learning atmosphere in which students can achieve their best.

NUIG – ALICE PERRY ENGINEERING BUILDING

NUI GALWAY - IT BUILDING

Engineering Building

NUI Galway's Alice Perry Engineering, is the largest School of Engineering in the country. The building is equipped with world class facilities, providing a working example for engineering students to study. The building gives our students an opportunity to engage with other students and to help them to understand engineering. From exposed structural elements on view to built-in sensors (measuring light, temperature, carbon dioxide, strain) throughout, these features provide our student with a real learning experience.

This learning laboratory, located beside the river Corrib houses state-of-the-art lecture theatres, classrooms, research facilities and breakout spaces where students collaborate on projects and discuss the latest cutting edge developments in Engineering. Our laboratories give our students an opportunity to design and build prototypes for testing and evaluation.

Find out more at: www.nuigalway.ie/engineering-informatics

IT Building

The IT Building overlooks the River Corrib and is equipped with state-of-the-art facilities including: dedicated computer suites for undergraduate students, specialised computer laboratories, computer architecture and common net working technologies and embedded systems. Supercomputer facilities provide HPC support to students. The Discipline of Information Technology maintains its own LAN infrastructure. A Gigabit Fibre backbone connects all labs to the main servers. Computer nodes have a full duplex 100MB connection to the backbone. The discipline runs its own windows, unix and linux servers which provide web, email, print and database services. The HEAnet offer high speed internet connection to the college and discipline. Our MSDN academic license offers students the opportunity to use full Microsoft products for software development, along with any open-source software available.

how to apply

How to Apply

Irish, UK and EU Undergraduate Applications:
You can apply online or submit a paper application to the Central Applications Office (CAO).

Where do I submit my paper application?

You can send your paper application to the following postal address:

The Central Applications Office
Tower House, Eglinton Street, Galway
T: + 353 91 509 800
www.cao.ie

Important CAO dates to remember

There are three closing dates for applications. Please consult the CAO website for up-to-date information.
Normal application: 1 February
Late applications: 1 May
Change of mind: 1 July

Further information on Undergraduate Admission is available from the Undergraduate Admissions Office.
www.nuigalway.ie/admissions

Entry Requirements to Undergraduate Programmes

LEAVING CERTIFICATE (for EU & non-EU)

You need a pass in at least six subjects in accordance with College requirements with:

at least Grade H5 in two subjects and at least Grade H7 or O6 in the four subjects.

You should pick your subjects based on the requirements for entry to your desired programme.

GCE AND GCSE

You need a pass in at least six subjects in accordance with College requirements with at least:

GCE Advanced Level: Grade C in two recognised subjects and GCSE Level: Grade C in four recognised subjects.

You should pick your subjects based on the requirements for entry to your desired programme.

For details of the current list of GCE and GCSE subjects accepted for matriculation purposes, you should check out the NUI Galway website.
www.nuigalway.ie/admissions/procedures/alevelapp.html

Additional requirements are indicated within the detail for each programme in this prospectus.

International Students

We welcome applications from international students. www.nuigalway.ie/international-students.

Bonus Points for Honours Mathematics

Students that pass the Honours Mathematics examination (H6 or better) in the Irish Leaving Certificate or equivalent shall be awarded 25 bonus points.

Engineering Maths Qualifying Exam

The College of Engineering and Informatics at NUI Galway hold an Engineering Maths Qualifying Exam. A pass in this examination satisfies the Maths entry requirement for our Engineering and Computer Science and Information Technology programmes. (As an alternative to the leaving certificate Mathematics requirement H4 for Engineering programmes or H6/O2 for the BSc in Computer Science & Information Technology or Project and Construction Management). Application forms to take the exam are available in August.

It is recommended that students sitting the Engineering Maths Qualifying Exam familiarise themselves with past exam papers as early as possible, as the layout and content of the papers can differ significantly to those of the leaving certificate. Past Exam Papers can be downloaded from the NUI Galway website.

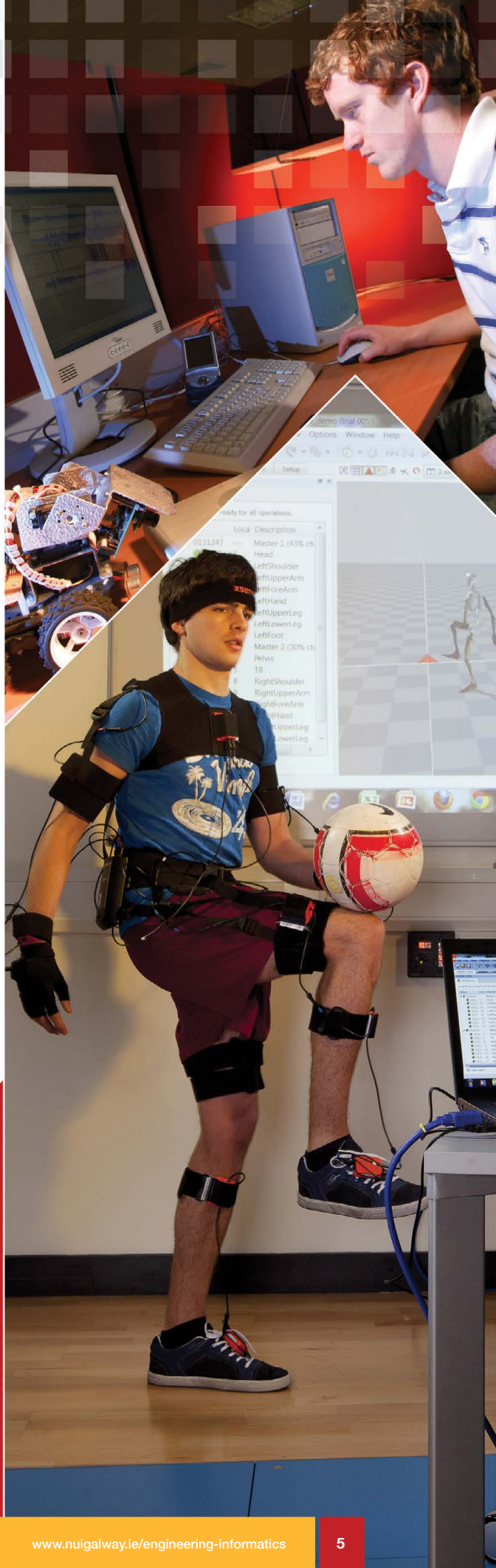
In advance of the examination, the University holds an Intensive Preparatory Course for applicants intending to sit this examination. The course will run over five days in August. As well as preparing students for the special examination, lecturers will demonstrate the significant relevance of mathematics across the engineering programmes and will highlight the applicability of mathematics to some illustrative engineering examples.

Please note that admission to the preparatory course is limited to students who have applied for our programmes through CAO.

Find out more

To find out more or to book a place on the preparatory course, please email the details below with your name, contact details and your CAO application number.

The College of Engineering and Informatics
T: +353 91 492 101
E: engineeringandinformatics@nuigalway.ie
www.nuigalway.ie/engineering-informatics



your first year experience

Your first year at NUI Galway will see you immersed in a completely new life from both an educational and social perspective. Educationally, the first year will be spent intensively learning and discovering how to solve problems through physics, chemistry and mathematics as well as gaining exposure to engineering subjects such as computing, graphics and engineering design. It is through exposure to the principles of engineering in first year that you will increase your understanding of the various subject areas.

The social life of an NUI Galway student is second to none. There are many clubs and societies. We encourage all of our students to get involved.

ALIVE (A Learning Initiative and the Volunteering Experience) is NUI Galway's student volunteer programme that aims to promote greater civic engagement, academic activities, namely teaching, research and service at the levels of students, staff, courses, programmes and the institution as a whole. Students have an opportunity to enrich their personal development and employability skills, have a fun experience and make new lifelong friends, attain an ALIVE Certificate from NUI Galway, learn from community which could enhance academic learning and build personal knowledge and skills while contributing to the community.

your placement experience

The Professional Experience Programme (PEP) is an integral part of the programmes offered by the College of Engineering and Informatics, NUI Galway. PEP offers students an opportunity to avail of work integrated learning relevant to their programme of study which will significantly improve your chances of obtaining employment after graduation.

Students gain a practical appreciation of the needs and skill sets required in business and industry. Towards the end of third year, you will undertake an eight-month (January-August) off-campus work placement. Civil and Project and Construction students undertake a five-month (April-August) work placement. This Professional Experience Programme gives you an opportunity to work on projects relevant to your programme of study. Training in communication skills, teamwork, ethics and other professional skills are provided throughout your time in NUI Galway in order to prepare you for the working environment.

Staff in the Placement Office assist students to acquire their placement in Ireland or abroad. Often students are offered graduate positions with their placement company.

Employers recruit our students, because they:

- **bring new ideas and look at 'old' problems with 'fresh eyes'.**
- **have good problem-solving and analytical skills.**
- **are up-to-date on new techniques and technologies.**

Placement is an important part of your programme, as it gives you the chance to see what it is like to work in an area related to your degree. This will help you make more informed decisions about your career.

Find out more:

Professional Experience Programme
T: +353 91 493 646
E: placement@nuigalway.ie
www.nuigalway.ie/placement

engineering all you need to know

Engineers educated at NUI Galway take the current and envisage the future.

Engineering is one of the most popular degrees at NUI Galway. During the first (common) year of your studies, you will have the opportunity to gain an insight into the range of engineering disciplines available, so that you can make an informed choice about your future.

Engineering plays a critical role in the development of the global economy. It is at the heart of innovation and design for the development of smart products, services and infrastructure, throughout the world. Engineers are sought after as the creators and designers for sustainable development of economic, energy and natural resources.

Today's engineers are inventors, innovators, designers and leaders in society and business. From suspension bridges to nanotechnology, smart phones to space exploration, and robotics to renewable energy, engineers are at the forefront of developing technologies and implementing solutions to address the problems and demands of today's world. An engineer's skill set includes the ability to be innovative and creative, apply scientific knowledge, be resourceful in difficult situations, and have good business and project management skills.

We know you have lots of questions about engineering, so to answer some of them we have listed your most frequently asked questions.

What is Engineering?

Engineering is practical problem solving. Engineers use their skills and knowledge in a specific field to make things work, solve problems and improve the world around us.

Engineers can be involved in building, testing and designing all sorts of products and structures. They can be found all over the world working in many different areas: environmental management, transport, medicine, broadcasting, electronics and even enabling space exploration. You name it, engineers have worked on it!

What does an Engineer do?

Engineers are involved in designing, testing and building everything. Whether it is your new mobile phone or tablet computer - engineers have had a hand in making it. Engineering is central to an exciting range of businesses and industries, including construction, transport, cosmetics, medicine, energy, sport and much more. With engineering, you can follow your interests – if you like sport, you can work as an engineer improving the performance of players.

Engineers work in offices, laboratories, film studios, in the outdoors and underground. Engineering today is closely linked with technology, and plays a major role in many technological advances and new device production.

What jobs are there in Engineering?

There are jobs in a wide range of specialist areas and roles at all levels from engineering technician to senior engineer. You can also progress to management and research.

Technology is always moving on and engineers often change their job focus to broaden their knowledge or explore new specialisms. This variety is one of the reasons engineers enjoy their jobs so much!

Engineers can work in exciting industries including construction, transport, medicine, energy and much more. Many other industries value skills learned on an engineering programme. Employment among professional engineers is among the highest of any sector across the world.

The good news is that whatever your interests are - in or outside of school, there is probably a branch of engineering that will match.

Do I have to be good at Physics, Chemistry, Maths?

Engineers do need to be good at maths and sciences, physics in particular, as it is applied to a number of different engineering problems. As well as good grades in mathematics and science, engineering also requires hands-on experience; and an understanding of innovation principles, processes, design and the practical needs of societies.

If you have ever taken something apart to find out how it works, enjoyed building things or have a desire to improve an existing product, engineering is for you.

Is it a good job?

Engineering is incredibly rewarding, giving you the chance to work with like-minded individuals on complex projects to solve real problems for society. Engineers make a real difference to the world. Over the next few years engineers will find the solutions to a number of global problems – climate change, renewable energy, combatting disease, clean water and population growth. Engineers shape our lifestyles. They are at the forefront of developing new life-saving medical devices and communications technology.

Is it just for men?

Absolutely not! Year-on-year the number of women working as engineers is increasing, as the range of career options available expands, including design, television, mobile phones, medicine, materials, energy, biomedical, electrical, electronic, civil engineering, construction and more.

Although it is true that the proportion of women in engineering is lower than men, huge strides are being made to ensure that the positive upward trend continues.

Sounds interesting, how do I get into it?

Firstly, you need to consider whether you enjoy science and mathematics subjects, because many engineering and technology roles are based on the principles of those subjects. If you do, you should make sure to study these subjects in your Leaving Certificate.

“what our engineering students say”

“I am an Energy Systems Engineering student. My course combines elements of civil, electronic and mechanical engineering to give a wide range of understanding while at the same time giving very specific detail in specialist areas. During the course, many guest lectures are given by people who are experts in the area of sustainable development. These include wind turbines, electric cars, hydrogen fuel etc. Along with this we were brought on site visits. I personally enjoyed these the most because it related everything we had been studying to the real world.

Daniel Fahy,
Energy Systems Engineering

“While I was studying in NUI Galway, I met some amazing people who gave me the freedom to attack problems that I wanted to solve and then believed in me until I succeeded. Ultimately, this freedom and trust gave me the confidence to build a company that could solve much bigger problems. I’m now the Founder and CEO of a tech startup called Ex Ordo. When I was in college, I learned how to build web sites and then when I graduated, I decided to go out on my own and I started building web apps from my bedroom. In April 2011, I pulled together a team of people and we started to build a web app that is now known as Ex Ordo.

Ex Ordo is a web app that manages research conferences. We launched a beta version of the software in September 2011 and within a year, we were powering about 50 conferences in Europe, the US and Asia. By 2015 our technology will be powering 2,000 conferences worldwide.”

Paul Killoran,
Electronic and Computer Engineering

"The new Engineering Building has really enhanced my learning experience. As you walk through the corridors, you see sections of different elements of the building exposed – such as the reinforcement bars in the concrete walls, the base of a concrete column, and electrical wires. Such elements would usually be hidden in any other building. Here they are left open to view so that students can see for themselves how they are installed."

Michael Fleming,
Civil Engineering

As a PhD researcher in Biomedical Engineering at NUI Galway I investigate medical devices for the femoral artery, the major artery of the leg. I became interested in research after completing my final year project in the fourth year of my undergraduate Biomedical Engineering degree. Studying Biomedical Engineering at NUI Galway introduced me to the fascinating world of medical devices. The degree provided me with the fundamental skill set required to begin a career as an engineer along with the opportunity to study a broad range of subjects. From this I identified my research topic."

Ríona Ní Ghriallais,
Biomedical Engineering

"I'm a Construction Project Manager with SSE Renewables (Airtricity). I coordinate and manage the main contractors who work on a windfarm construction site to ensure the delivery of the project safely, on budget and on time. I also coordinate with the grid operator, either ESB on the network or Eirgrid on the transmission side, to ensure timely delivery of our grid connection. In addition, I deal with all landowners from whom we are leasing land to construct a turbine or perhaps simply installing a cable through their land. As part of my course, I studied highway and traffic design and design of concrete structures. I also studied project management and this has been invaluable in allowing me to start work as a graduate project manager. I chose NUI Galway due to the excellent reputation of the College of Engineering and Informatics."

James O'Hara,
Civil Engineering

GY401

Bachelor of Engineering

Undenominated

Course Overview

Engineering is a wide area, covering fields such as civil, mechanics, electronics and computer technology. Undenominated Engineering is designed for students who are interested in becoming an engineer, but uncertain as to which field they want to specialise in. This course offers you the option of studying engineering in a general way for one year before going on to specialise in your chosen field in year two. In first year you get to explore different areas of engineering allowing you the time you need to find the discipline that is right for you. The programme is made up of lectures, laboratory classes, assignments, project work and examinations. On successful completion of first year exams, you apply to transfer to one of the denominated engineering programmes. With 8 denominated engineering programmes to choose from, undenominated engineering allows you the time to choose the right one for you. You will continue to study that particular area for the remainder of your chosen four year programme.

Career Opportunities

Depending on your choice, there are a wide range of career opportunities in industry, universities, hospitals, medical institutes, governmental regulatory agencies, research, software companies and financial services NUI Galway engineering graduates hold internationally recognised degrees and are in high demand both in Ireland and abroad.

Find Out More:

College of Engineering and Informatics
T: +353 91 492 101
E: engineeringandinformatics@nuigalway.ie
www.nuigalway.ie/engineering-informatics

What Our Students Say...

Mary Brigid O'Shea, Biomedical Engineering

I studied Undenominated Engineering and then branched into Biomedical Engineering in second year. I chose the course as I had a huge interest in science and was strong at maths in secondary school. I also have an innate interest in how things work. I chose Undenominated Engineering as I was unsure which field of engineering I wanted to pursue. The undenominated course allowed me to try out different subjects from different disciplines so I could make an informed decision at the end of first year.

Key Facts — CAO Code: GY401

Entry requirements:	Minimum Grade HC3 in two subjects and passes in four other subjects at H or O Level in the Leaving Certificate, including Irish, English, Mathematics, a laboratory science subject (i.e. Chemistry, Physics, Biology, Physics with Chemistry (joint) or Agricultural Science) or Technology and any two other subjects recognised for entry purposes. In addition, students must obtain a minimum of Grade C3 in the Higher Level Leaving Certificate paper in Mathematics or, alternatively, obtain a pass in the Special Engineering Entrance Examination in Mathematics (held in the university).
Additional requirements:	**Leaving Certificate:** Minimum of Grade C3 in the Higher Level Leaving Certificate paper in Mathematics or alternatively obtain a pass in the Special Engineering Entrance Examination in Mathematics (see page 5). **A-levels:** A minimum of Grade C in A-level Mathematics was required
Duration:	1 Year (Students then transfer into a denominated programme)
Entry points Range:	430 - 595
A Level Grades:	See the following webpage for entry requirements www.nuigalway.ie/admissions/procedures/alevelapp.html
Average intake:	160 - 170

Course Outline

Year 1

- Engineering Calculus
- Engineering Mathematical Methods
- Engineering Mechanics
- Engineering Chemistry
- Engineering Physics
- Fundamentals of Engineering
- Engineering Graphics
- Engineering Design
- Engineering Computing

On successful completion of Year 1, students will transfer to Year 2 of a denominated programme:

What Our Students Say...

Robert Reid,
Civil Engineering

Though I knew that I wanted to pursue a career in engineering from an early age I was unsure which subject area to choose on my CAO. Choosing Undenominated Engineering gave me the opportunity to make an informed decision. On completing Year 1, I chose to study Civil Engineering. I found that having basic insights into the many different types of engineering was beneficial. In Year 3 as part of my five month placement I worked with Arup, one of the largest engineering firms in the world. This placement enabled me to put my knowledge into practice and helped me decide on a topic for my Final Year Project.

GY413

Bachelor of Engineering

Energy Systems Engineering

Course Overview

Energy Systems Engineering is a multidisciplinary programme. It aims to meet the growing challenges of dwindling fossil fuel resources. Future engineers must use conventional energy sources in innovative ways while creating novel technology for renewable energy. The programme covers fundamental engineering knowledge and skills in such areas as energy generation, conversion, electrical power systems and energy management (buildings, transport, industry, etc.), along with modules on energy sources, energy policy, economics and associated environmental issues. This Level 8 degree is fully accredited by Engineers Ireland.

The programme will provide you with the skills to develop as a professional engineer who specialises in dealing with the breadth of energy systems used to generate, convert, transmit and manage energy throughout multiple networks, including electrical power, fuel, IT, water, transport, and cities. Optional modules will provide you with a technical focus on different sectors of the industry. The early years of the programme will cover the fundamental sciences and mathematics, along with introductory modules on energy systems and sources. Multidisciplinary energy systems design projects will be supported by advanced modules in engineering design, analysis and information technology. In the final year, students have the opportunity to select a mechanical, electrical or civil specialisation.

Career Opportunities

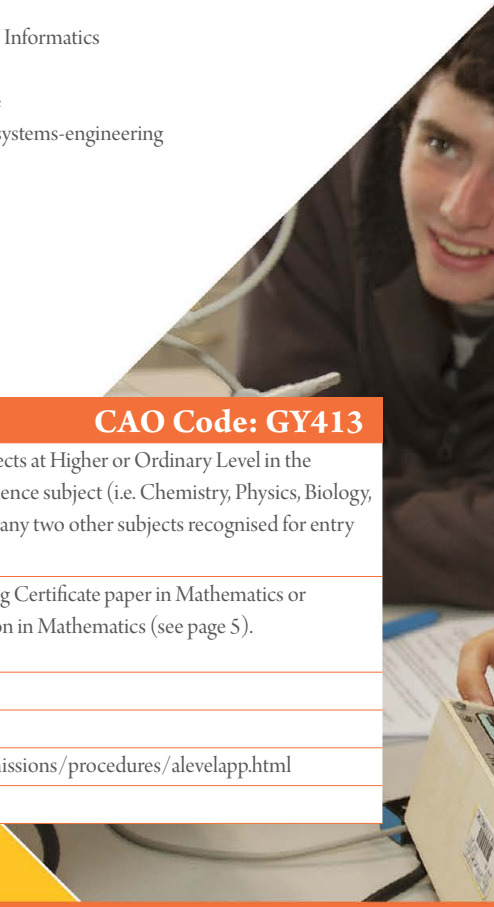
A wide variety of jobs are available for energy systems engineers, including design, innovation, research, consultancy, project management, energy systems management and product development. With increasing focus on issues of security of supply and energy sustainability, the need for graduates with skills in energy systems technologies is growing. Graduates are sought in a range of industries including renewable energy systems, building energy management, electrical power systems, smart grid, energy consultancy, and transport.

Further Education

After completion of the four-year undergraduate degree, suitably qualified candidates have the option to continue their studies to PhD or Masters level. The PhD is a research programme, where, with the assistance of a supervisor, you will specialise in a chosen area of study. Scholarships are available for PhD research. Alternatively, you may opt to continue into the ME in Energy Systems Engineering, a one-year (September-May) taught programme that will advance your knowledge towards a career in industry. This is a Level 9 Masters programme accredited by Engineers Ireland, providing a route to Chartered Engineer status that will be recognised worldwide. Research Masters degrees are also available.

Find Out More:

College of Engineering and Informatics
T: +353 91 492 664
E: energyeng@nuigalway.ie
www.nuigalway.ie/energy-systems-engineering



Key Facts	CAO Code: GY413
Entry requirements:	Minimum Grade Higher C3 in two subjects and Passes in four other subjects at Higher or Ordinary Level in the Leaving Certificate including: Irish, English, Mathematics, a laboratory science subject (i.e. Chemistry, Physics, Biology, Physics with Chemistry (joint), Agricultural Science) or Technology and any two other subjects recognised for entry purposes.
Additional requirements:	**Leaving Certificate:** Minimum of Grade C3 in the Higher Level Leaving Certificate paper in Mathematics or alternatively obtain a pass in the Special Engineering Entrance Examination in Mathematics (see page 5). **A-levels:** A minimum of Grade C in Mathematics is required.
Duration:	4 years
Entry points Range:	430 - 580
A Level Grades:	See the following webpage for entry requirements www.nuigalway.ie/admissions/procedures/alevelapp.html
Average intake:	40

Course Outline

Year 1

- Engineering Calculus
- Engineering Mathematical Methods
- Engineering Mechanics
- Engineering Chemistry
- Engineering Physics
- Fundamentals of Engineering
- Engineering Graphics
- Engineering Design
- Engineering Computing

Year 2

- Mathematics and Applied Mathematics
- Thermodynamics & Fluid Mechanics
- Electronic Instrumentation and Sensors
- Strength of Materials
- Electrical Circuits and Systems
- CADD & Design Project
- Engineering Statistics
- Introduction to Modelling
- Principles of Building

Year 3

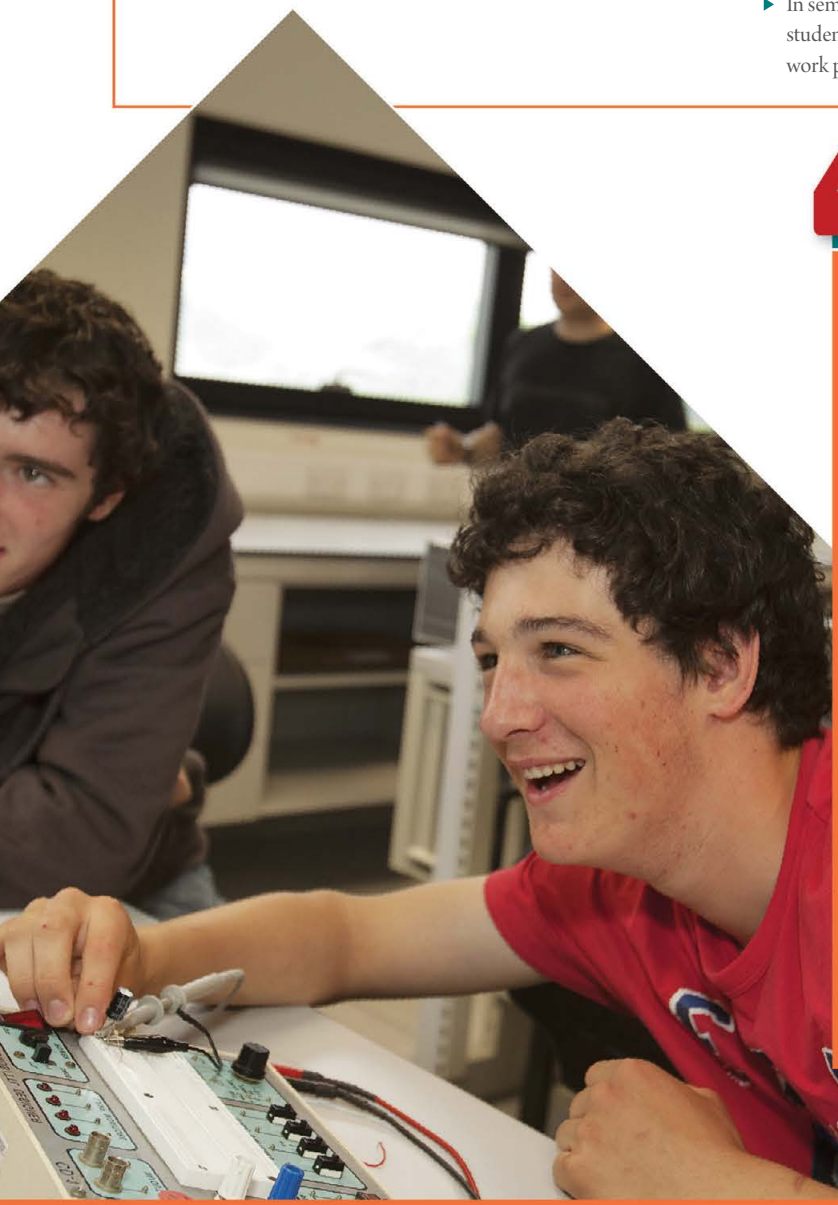
- Electromechanical Power Conversion
- Sustainable Energy
- Thermodynamics and heat Transfer
- Mechanical Analysis and Design
- Object Oriented Programming
- Energy Systems Engineering Design Project
- Fluid Dynamics
- Linear Control Systems
- Project Management for Engineers
- Professional Skills
- In semester 2 of third year, students undertake an 8-month work placement (see page 7).

Year 4

- Project Management
- Energy in Buildings
- Energy Conversion
- Smart Grid
- Energy Systems Engineering Project
- Advanced Energy Systems Engineering

Electives

In Year 4 students will focus on Civil, Mechanical or Electrical aspects of Energy Systems Engineering.



What Our Students Say...

Vincent Hurley, Energy Systems Engineering

Energy Systems Engineering was a programme that I was very interested in as a Leaving Cert Student because it is the first of its kind in Ireland and it has lived up to all my expectations. During my course I was really excited to get involved in the PEP work placement programme where I spent time in Zambia volunteering as an engineer with the Alan Kerins Projects and developing the towns of Kaoma and Mongu. It gave me an opportunity to apply the theory I've learned in class to the real environment.

NUI Galway was an easy choice for me. There are plenty of really good transport links especially since the opening of the new motorway. The city is full of really friendly people with exciting events happening all throughout the year. Clubs and societies are an active part of the college and the choices are extensive which means there is something for everyone. The new engineering building has been an amazing boost to the learning experience in NUI Galway. This year I took part in the annual Energy Night. It allowed me to make friends with people who have the same interests as me, outside of study. NUI Galway is a brilliant place to go to college and I can't imagine being anywhere else.

GY402

Bachelor of Engineering

Civil Engineering

Course Overview

Civil Engineering is the profession concerned with the planning, design, construction and maintenance of the built environment. It encompasses structures from small scale, such as houses and commercial buildings to large scale, such as skyscrapers, bridges, dams and tunnels. The work of civil engineers is also evident in infrastructure such as road/motorway and rail networks, airports and harbours, and transport planning/management. The single biggest medical advance in the last 150 years has been the availability of clean drinking water; water and wastewater treatment are important roles performed by civil engineers that help keep our population healthy. Civil engineers also have a role in mitigating the effects of climate change, through the development of more sustainable forms of energy and protection from flooding, for example.

The Civil Engineering BE degree programme at NUI Galway develops the scientific, technical, organisational, computing and communication skills needed for a challenging and rewarding career in the profession. In the first year, the mathematical and scientific basis is established, while from second year onward; the main sub-disciplines (structures, environmental, geotechnics, transport and hydraulics) are developed through lectures, practical work and site visits. The Professional Experience Programme allows students to gain valuable work experience for 5 months between the 3rd and 4th years of the programme. The degree is accredited by Engineers Ireland, so it is recognised internationally under the Washington Accord, allowing graduates the option to work in Ireland or gain experience in other countries.

Career Opportunities

There is currently a grave shortage of Civil Engineers in Ireland as the economy recovers from the recent recession. Civil Engineers are needed worldwide to meet the constant demand for safe, efficient and environmentally-friendly infrastructure such as buildings, bridges, tunnels, transportation systems and water treatment systems. Graduate employment positions for Civil Engineers include:

- Civil engineering design consultants
- Civil engineering contractors
- Local authorities and government bodies
- Energy (oil, gas, wind, wave) and mining companies
- Overseas development
- Business, finance, management and other non-engineering careers.

Further Education

Upon completion of the undergraduate degree, suitably-qualified candidates have the option of pursuing postgraduate study at NUI Galway.

The discipline offers an ME (Level 9) in Civil Engineering, a one-year taught programme designed to provide the extra technical knowledge and leadership/management skills required by those aspiring to Chartered Engineer status. Like the BE, the ME is accredited by Engineers Ireland, and is therefore recognized internationally under the Washington Accord.

Students can also choose to conduct independent research into a specialised topic, under the supervision of a staff member, leading to either a Master's degree (Level 9) or PhD (Level 10) by research.

Find Out More

Civil Engineering
T: +353 91 492 170
E: brid.flaherty@nuigalway.ie
www.nuigalway.ie/civileng/

Key Facts	CAO Code: GY402
Entry requirements:	Minimum Grade HC3 in two subjects and passes in four other subjects at H or O Level in the Leaving Certificate, including Irish, English, Mathematics, a laboratory science subject (i.e. Chemistry, Physics, Biology, Physics with Chemistry (joint) or Agricultural Science) or Technology and any two other subjects recognised for entry purposes. In addition, students must obtain a minimum of Grade C3 in the Higher Level Leaving Certificate paper in Mathematics or, alternatively, obtain a pass in the Special Engineering Entrance Examination in Mathematics (held in the university).
Additional requirements:	**Leaving Certificate:** Minimum of Grade C3 in the Higher Level Leaving Certificate paper in Mathematics or alternatively obtain a pass in the Special Engineering Entrance Examination in Mathematics (see page 5). **A-levels:** A minimum of Grade C in Mathematics is required.
Duration:	4 years
Entry points Range:	400 - 500
A Level Grades:	See the following webpage for entry requirements www.nuigalway.ie/admissions/procedures/alevelapp.html
Average intake:	50

Course Outline

Year 1

- Engineering Calculus
- Engineering Mathematical Methods
- Engineering Mechanics
- Engineering Chemistry
- Engineering Physics
- Fundamentals of Engineering
- Engineering Graphics
- Engineering Design
- Engineering Computing

Year 2

- Mathematics and Applied Mathematics
- Engineering Materials
- Thermodynamics and Fluid Mechanics
- Electronic Instrumentation and Sensors
- Principles of Building
- Engineering Hydraulics
- Civil Engineering Materials & Design
- Building Information Modelling and Surveying
- Strength of Materials

Year 3

- Structural Engineering Design
- Solids & Structures
- Geomechanics and Geology
- Engineering Hydraulics
- Environmental Engineering
- Transportation Systems and Infrastructure
- Construction Operations
- Toward the end of third year, students undertake a five month work placement (see page 7).

Year 4

- Civil Engineering Project
- Structural Engineering Design
- Geotechnical Engineering
- Coastal and Offshore Engineering
- Structural Analysis
- Project Management
- Design of Sustainable Environmental Systems
- Hydrology and Water Resource Engineering
- Energy in Buildings

What Our Students Say...

James Boyce,
Civil Engineering

I am a mature student with over 25 years spent in a previous career. My student experience has been both challenging and rewarding. I have built up a strong, wide-ranging knowledge base. This has been achieved through a well designed and structured course and helpful and supportive lecturers. I have thoroughly enjoyed the course and this is due in no small way to the friendliness of my fellow students and the open and easy atmosphere of the University itself.

GY410

Bachelor of Science

Project and Construction Management

Course Overview

Every project creates a unique product, service or result. The Project and Construction Management degree sets out to develop the technical, business, managerial and interpersonal skills to succeed in industry. Project and Construction managers are now a specific and necessary role within the construction industry.

Project and Construction Management is an interdisciplinary degree programme, providing students with an extensive training in both construction management and project management and essential managerial aspects to carrying out large, complex projects in industry. This degree programme prepares graduates for taking on technical, management, academic and research and development level positions across a range of industries.

Becoming a project and construction manager will mean you will be trained in the fundamentals of civil engineering, construction, business and economics. You will learn about managerial and accounting principles, get an introduction to human resources management and gain an insight into the concepts of financial management. Other focuses over the four-year programme are health and safety law, quality management and planning. The course will provide you with the capacity to critically analyse and apply problem solving skills across a growing and diverse number of construction specialisms.

Career Opportunities

The skills gained from this programme are highly sought after by employers. Graduates are qualified to work as engineering assistants, construction project managers and in various supervisory roles across the sector.

Further Education

Once you have completed your undergraduate degree students may apply to study a PhD or Masters by Research at NUI Galway.

Find Out More

Civil Engineering
T: +353 91 492 170
E: brid.flaherty@nuigalway.ie
www.nuigalway.ie/engineering-informatics

Key Facts	CAO Code: GY410
Entry requirements:	Minimum Grade Higher C3 in two subjects and Passes in four other subjects at Higher or Ordinary Level in the Leaving Certificate including: Irish, English, Mathematics, a laboratory science subject (i.e. Chemistry, Physics, Biology, Physics with Chemistry (joint), Agricultural Science or Technology) and any two other subjects recognised for entry purposes.
Additional requirements:	**Leaving Certificate:** Minimum Grade D3 in the Higher Level or B3 in the Ordinary Level Leaving Certificate paper in Mathematics. Or, alternatively obtain a Pass in the Special Engineering Entrance Examination in Mathematics (see page 5). **A-levels:** A minimum of Grade D in A-Level Mathematics or Grade B at O Level is required.
Duration:	4 years
Entry points Range:	325 - 455
A Level Grades:	See the following webpage for entry requirements www.nuigalway.ie/admissions/procedures/alevelapp.html
Average intake:	20

Course Outline

Year 1
- Mathematics
- Introduction to Physics
- Engineering Graphics
- Introduction to Engineering and Design
- Fundamentals of Project and Construction Management
- Engineering Computing
- Financial Accounting
- Management
- Management Accounting

Year 2
- Health and Safety Law
- Building Information Modelling (BIM)
- Strength of Materials
- Principles of Building
- Civil Engineering Materials & Design
- Business Law
- Management Accounting
- Fundamentals of Operations Engineering
- Project Planning and Organisation
- Introduction to Statistical Data and Probability

Year 3
- Economics
- Operations Research
- Human Resource Management
- Construction Operations
- Project Planning & Organisation II
- Structural Engineering Design
- Transportation Systems and Infrastructure
- Geomechanics and Geology
- Safety Technology
- Professional Practice
- Toward the end of third year, students undertake a five month work placement (see page 7).

Year 4
- Project and Construction Management Project
- Estimates and Costing
- Management of Organisational Change
- Quality Systems
- Technology Innovation and Entrepreneurship
- The Built Environment
- Project Management
- Safety and Construction
- Managerial Economics
- Business Law II

What Our Students Say...

Allan Hannon, Graduate and Design Engineer at Bord Gais Networks

"The BSc in Project and Construction is such an interdisciplinary programme that I was at a distinct advantage in gaining employment, having a firm understanding of a broad range of topics. The course also taught me to be adaptable; with each day being so different and with new issues arising all the time, it is important to develop this skill."

GY406

Bachelor of Engineering

Electronic and Computer Engineering

Course Overview

Electronic & Computer Engineers design computer systems such as: tablet computers, communications systems (smart phones, computer networks, broadband internet, wireless mobile networking), medical devices (patient-worn monitors, hospital based systems), energy systems, next generation smart –manufacturing systems, transportation systems (cars, buses, trains, aeroplanes). Electronic and Computer Engineers also write software such as: mobile apps, internet applications, medical diagnostics software, signal processing for multimedia applications, GPS, networking and more.

Electronic & Computer Engineering is about designing computer software and electronic hardware that together drive applications in: mobile communications, internet systems/devices, automotive and medical/ healthcare systems.

Career Opportunities

Career opportunities for Electronic & Computer Engineers are plentiful and varied. Numerous companies around the world and particularly in Ireland are experiencing a shortage of engineers with skills in hardware and software. Ireland has a diverse mixture of large companies such as: **Intel**, **Analog Devices**, **IBM**, and **Ericsson**, each developing next generation technologies to industries as diverse as computing, communications, automotive, aerospace, financial and biomedical. However, the one common factor that binds them all together is the fact that they need good people with software and hardware skills in order to deliver next generation technologies to the masses.

Throughout Ireland, there are numerous smaller companies thriving on a very buoyant technology market. Companies such as **Ex-Ordo**, **Chipright** and **Blue Tree Systems** are experiencing huge demand for their services and products globally and will need a strong supply of highly educated, enthusiastic and creative engineers to carry them to even greater success. Graduate entrepreneurs also have the opportunity to start their own business, as several graduates of Electronic & Computer Engineering have done in the past, with many of them now becoming established brands on the national and international markets.

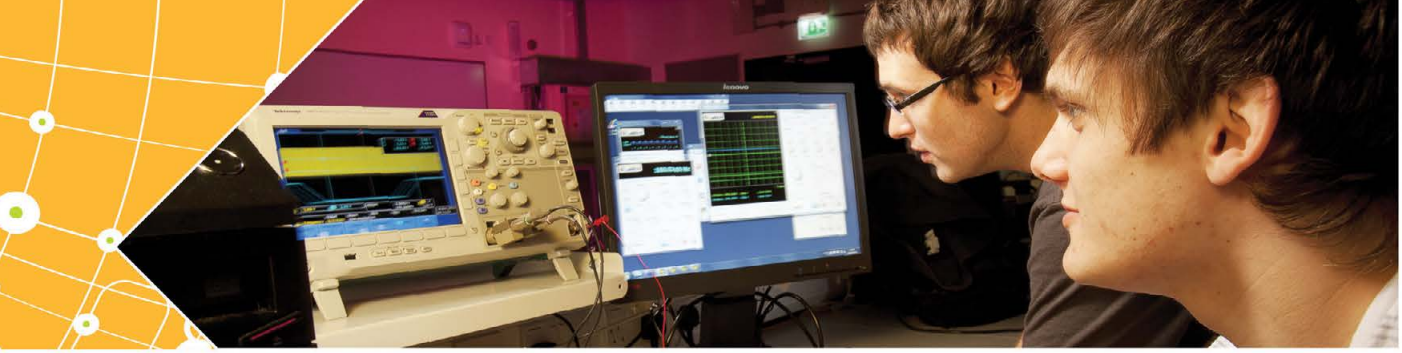
Further Education

Once you have completed your undergraduate degree, suitably qualified graduates have the option to continue their studies on the level 9 ME in Electronic & Computer Engineering. Graduates also have the option of studying for a PhD where, with the assistance of a supervisor, you will specialise in a chosen topic and produce an independently researched body of work.

Find Out More

Electrical & Electronic Engineering
T: +353 91 492 728
E: mary.costello@nuigalway.ie
www.nuigalway.ie/eee/

Key Facts	CAO Code: GY406
Entry requirements:	Minimum Grade Higher C3 in two subjects and Passes in four other subjects at Higher or Ordinary Level in the Leaving Certificate including: Irish, English, Mathematics, a laboratory science subject (i.e. Chemistry, Physics, Biology, Physics with Chemistry (joint) or Agricultural Science) or Technology and any two other subjects recognised for entry purposes.
Additional requirements:	**Leaving Certificate:** Minimum of Grade C3 in the Higher Level Leaving Certificate paper in Mathematics or alternatively obtain a pass in the Special Engineering Entrance Examination in Mathematics (see page 5). **A-levels:** A minimum of Grade C in Mathematics is required.
Duration:	4 years
Entry points Range:	445 - 615
A Level Grades:	See the following webpage for entry requirements www.nuigalway.ie/admissions/procedures/alevelapp.html
Average intake:	20



Course Outline

Year 1

- Engineering Calculus
- Engineering Mathematical Methods
- Engineering Mechanics
- Engineering Chemistry
- Engineering Physics
- Fundamentals of Engineering
- Engineering Graphics
- Engineering Design
- Engineering Computing

Year 2

- Mathematics and Applied Mathematics
- Engineering Statistics
- Communication Systems Engineering
- Electronic Instrumentation and Sensors
- Electrical Circuits & Systems
- Analogue Systems Design I
- Digital Systems I
- Microprocessors Systems Engineering
- Object Oriented Programming
- OOP: Data Structures and Algorithms
- Fundamentals of EM Theory

Year 3

- Professional Skills
- Project Management for Engineers
- Embedded Systems Applications Programming
- Programming III
- Digital Systems II
- Analogue Systems Design II
- Signals and Communications
- Database Systems
- Communication Signals and Systems
- In semester 2 of third year, students undertake an 8-month work placement (see page 7)

Year 4

- System on Chip Design
- Engineering Electromagnetics
- Digital Signal Processing
- Telecommunications Software Appls
- Communications and Signal Processing Applications
- Distributed Systems and Co-Operative Computing
- Real-Time Systems
- Software Engineering III
- Machine Learning & Data Mining
- Project

What Our Students Say...

Shane Tuohy,
Electronic and Computer Engineering

I studied Electronic and Computer Engineering and loved it. The college is very well kitted out. The equipment in the labs is just top class and the technicians are amazingly helpful. The lecturers are friendly and definitely know their stuff. You get to work on genuinely interesting projects and use cutting-edge technologies. A great feature of the course is the five-month work placement in third year.

GY414

Bachelor of Engineering

Electrical and Electronic Engineering

Course Overview

Electrical and Electronic Engineering is involved with the development of technologies required for our future needs, including communication, entertainment, energy and healthcare. Electrical and Electronic Engineers apply their knowledge of electrical/electronic circuits and systems to design solutions in medical technology, e-commerce, mobile telephones, wireless communications, renewable energy and the internet of things (IoT). This degree programme provides students with a broad range of skills relating to all aspects of the design of electronic systems and devices. It combines coursework in different aspects of electrical and electronic engineering, as well as individual and group project work, where students design and build innovative electronic systems.

This programme provides a solid technological base from which a career in electrical and electronic engineering can be launched, along with the basic skills needed to sustain professional development throughout a graduate career. As it combines coursework, laboratory classes and projects in different aspects of electrical and electronic engineering, the programme will give graduates the knowledge and skills needed to design and develop innovation technologies for a wide range of industry sectors. It incorporates the design and development of devices, circuits and systems that are used in a wide range of high-tech products and so it will appeal to students who like to understand how technology works, and who have an interest in electrical or electronic circuits.

Career Opportunities

With the ongoing emphasis on energy, there is an increasing requirement for graduates in electrical generation, transmission and distribution, with companies like **ESB**, **Eirgrid** and **Bord Gais** all having active recruitment programmes.

Semiconductor manufacturing and design provides another dynamic career path, with many of the world's leading companies located in Ireland including **Intel**, **Analog Devices**, **On Semiconductor**, **Texas Instruments** and **Microsemi**.

Demands for expertise in electrical automation and control are also rising, particularly in the biomedical devices and pharmaceutical sectors, while the ongoing growth in demands for telecommunications provides yet another exciting career option in the development and testing of new devices and infrastructure.

Further Education

Once you have completed your undergraduate degree, suitably qualified students have the option to enrol and continue their studies to PhD or Masters level. Typically these are research led postgraduate courses where, with the assistance of a supervisor, you will specialise in a chosen area of study and work to produce an independently researched body of work.

Find Out More

Electrical & Electronic Engineering
T: +353 91 492 728
E: mary.costello@nuigalway.ie
www.nuigalway.ie/eee/

Key Facts	CAO Code: GY414
Entry requirements:	Minimum Grade Higher C3 in two subjects and Passes in four other subjects at Higher or Ordinary Level in the Leaving Certificate including: Irish, English, Mathematics, a laboratory science subject (i.e. Chemistry, Physics, Biology, Physics with Chemistry (joint), Agricultural Science) or Technology and any two other subjects recognised for entry purposes.
Additional requirements:	**Leaving Certificate:** Minimum of Grade C3 in the Higher Level Leaving Certificate paper in Mathematics or alternatively obtain a pass in the Special Engineering Entrance Examination in Mathematics (see page 5). **A-levels:** A minimum of Grade C in Mathematics is required.
Duration:	4 years
Entry points Range:	455 - 625
A Level Grades:	See the following webpage for entry requirements www.nuigalway.ie/admissions/procedures/alevelapp.html
Average intake:	20

Course Outline

Year 1

- Engineering Calculus
- Engineering Mathematical Methods
- Engineering Mechanics
- Engineering Chemistry
- Engineering Physics
- Fundamentals of Engineering
- Engineering Graphics
- Engineering Design
- Engineering Computing

Year 2

- Mathematics and Applied Mathematics
- Engineering Statistics
- Communications Systems Engineering
- Electronic Instrumentation and Sensors
- Electrical Circuits & Systems
- Analogue Systems Design
- Digital Systems
- Microprocessors Systems Engineering
- Programming
- Fundamentals of Electromagnetic Theory

Year 3

- Project Management
- Professional Studies
- Linear Control Systems
- Electromechanical Power Conversion
- Digital Systems
- Analogue Systems Design
- Signals and Communications
- Programming
- Communication Signals and Systems
- In semester 2 of third year, students undertake an 8-month work placement (see page 7)

Year 4

- System on Chip Design
- Engineering Electromagnetics
- Digital Signal Processing
- Telecommunications Software Applications
- Communications and Signal Processing Applications
- Power Electronics
- Power Systems
- Software Engineering
- Electrical and Electronic Engineering Project
- Digital Control Systems

What Our Students Say...

Shane McMorrow, Electrical and Electronic Engineering

Over the past four years, I have acquired a broad range of skills in both hardware and software design. The programme is taught by friendly and highly motivated lecturers who are always updating their courses to prepare students for tomorrow's changing technologies.

One major practical component of the course was the work placement in third year where I got to apply my skills in **IBM**. I've found this course challenging, interesting and highly relevant for my future career.

GY405

Bachelor of Engineering

Mechanical Engineering

Course Overview

Mechanical Engineering is a subject concerned with the design and manufacture of parts and systems that make up the range of machinery and equipment you see around you, from a can opener to a jet aircraft. Mechanical engineers design the tools and processes necessary to create all products, and are often involved from conceiving an idea right through to seeing it as a finished product ready for its commercial application.

This degree programme is designed to provide graduates with the skills to face the challenge for newer, better, faster, more reliable, more versatile, longer-lasting and more environmentally friendly products and processes. These skills need also to be complemented by the managerial and personal skills needed to interact with teams on joint projects. Learning about Mechanical Engineering will help you to develop your creative side, a part of your thinking that will enable you to design a new product or system and the analytical skills to make it a reality.

Mechanical engineers are exceptionally versatile. They manipulate force and velocity, pressure, heat and flow, stress and strain, shapes and materials to produce better machines that make life better. The degree course features the unique CAIRDE programme in second year, where students use their engineering skills to meet a need or to solve a problem in the community.

Career Opportunities

There are many options after you have completed your degree. You may use your skills in one of the many specialised technology companies in Ireland, including the medical device and computer industries. Alternatively you may travel overseas with your internationally recognised qualification, or continue your study to a more advanced level.

Further Education

Once you have completed your undergraduate degree, suitably qualified students have the option to enrol and continue their studies to PhD or Masters level. Typically these are research led postgraduate courses where, with the assistance of a supervisor, you will specialise in a chosen area of study and work to produce an independently researched body of work. From 2013 students can also advance their engineering knowledge towards a career in industry through a one year taught programme (September – June) that builds on the successful completion of their undergraduate programme. This programme is designed to meet Engineers Ireland's criterion for Level 9 degrees, providing graduates with a route to Chartered Engineering status that will be recognised worldwide.

Find Out More

Mechanical Engineering
T: +353 91 492 223
E: michelle.broderick@nuigalway.ie
www.nuigalway.ie/mecheng

Key Facts	CAO Code: GY405
Entry requirements:	Minimum Grade Higher C3 in two subjects and Passes in four other subjects at Higher or Ordinary Level in the Leaving Certificate including: Irish, English, Mathematics, a laboratory science subject (i.e. Chemistry, Physics, Biology, Physics with Chemistry (joint), Agricultural Science) or Technology and any two other subjects recognised for entry purposes.
Additional requirements:	**Leaving Certificate:** Minimum of Grade C3 in the Higher Level Leaving Certificate paper in Mathematics or alternatively obtain a pass in the Special Engineering Entrance Examination in Mathematics (see page 5). **A-levels:** A minimum of Grade C in Mathematics is required.
Duration:	4 years
Entry points Range:	425 - 625
A Level Grades:	See the following webpage for entry requirements www.nuigalway.ie/admissions/procedures/alevelapp.html
Average intake:	40

Course Outline

Year 1
- Engineering Calculus
- Engineering Mathematical Methods
- Engineering Mechanics
- Engineering Chemistry
- Engineering Physics
- Fundamentals of Engineering
- Engineering Graphics
- Engineering Design
- Engineering Computing

Year 2
- Mathematics and Applied Mathematics
- Electronic Instrumentation and Sensors
- Engineering Materials
- Thermodynamics and Fluid Mechanics
- Design
- Fundamentals of Operations Engineering
- Electrical Circuits and Systems
- Engineer in Society, Service Learning and Ethics
- Strength of Materials

Year 3
- Design
- Mechanical Analysis and Design
- Thermodynamics and Heat Transfer
- Fluid Dynamics
- Materials
- Automated Systems
- Mechanical Vibrations
- Electrical Power and Machines
- Linear Control Systems
- Quality Systems
- In semester 2 of third year, students undertake an 8-month work placement (see page 7).

Year 4
- Computational Methods in Engineering Analysis
- Project Management
- Advanced Mechanical Analysis and Design
- Energy Conversion
- Polymer Engineering

Electives
- In year 4 students also choose additional subjects from a variety of options.

What Our Students Say...

Caoimhe Sweeney, Mechanical Engineering

I chose Mechanical Engineering because it seemed to me to cover a broad range of subjects and offer a lot of opportunities. Second year built on first year's material. So far it has covered analysis and design, fluid mechanics, electronics, metal and polymer materials, programming and computer aided design. With the knowledge acquired of the different disciplines, everyone finds their niche within the course. For me, this was programming and computer modelling, which I intend to pursue in the coming years.

GY408

Bachelor of Engineering

Biomedical Engineering

Course Overview

Biomedical Engineering involves the use of cutting-edge technologies to help improve human healthcare. Biomedical engineers are involved in the design and creation of medical devices, implants such as stents, instruments and materials for clinical use. They also apply their engineering skills to problems in human biology and are at the forefront of developments in human medicine enabling the medical profession to diagnose and treat disease and repair or replace damaged living tissue.

This degree programme was developed as a result of the need within the biomedical industry for highly skilled personnel. Locally based biomedical companies, of which there is a significant cluster, were involved in its design. It therefore remains highly relevant to the needs of the industry while giving students a full training in engineering design principles and their application to human biology in an interdisciplinary environment.

Our students work side by side with the medical profession to promote health, reduce suffering and to make life better. They create devices, tools and solutions to solve problems clinicians face, thereby sustaining or improving life.

As part of the 3rd year of the degree students undertake a Professional Experience Programme (PEP). This entails an eight month paid placement in a biomedical engineering company where the student gains valuable high level engineering work experience. Following completion of PEP students have the opportunity to continue their interaction with the company through engineering research and design projects in the 4th year of the degree.

Career Opportunities

Biomedical Engineering offers a wide variety of exciting hi-tec career opportunities such medical device research and development (R&D), advanced manufacturing and product design, development of next-generation non-invasive delivery methods for therapeutics, technical innovations for minimally invasive surgical intervention. With eight of the world's top ten biomedical companies based in Ireland - many of which are in Galway - there are good prospects for employment nationally while remaining open to opportunities overseas.

Further Education

Once you have completed your undergraduate degree, suitably qualified students have the option to enrol and continue their studies to PhD or Masters level. In our PhD programme students develop highly innovative state-of-the-art solutions to current problems in biomedical engineering, frequently leading to new medical devices or strategies for treatment of disease. Biomedical engineering research at NUIG involves a high level of interaction with the hi-tec R&D sector of the medical device industry. Students can also advance their engineering knowledge towards a career in industry through a one year taught Masters programme (September-June) that builds on the successful completion of their undergraduate programme. This programme is designed to meet Engineers Ireland's criterion for Level 9 degrees, providing graduates with a route to Chartered Engineering status that will be recognised worldwide.

Find Out More

Biomedical Engineering
T: +353 91 492 723
E: Jane.Bowman@nuigalway.ie
www.nuigalway.ie/biomedeng

Key Facts	CAO Code: GY408
Entry requirements:	Minimum Grade Higher C3 in two subjects and passes in four other subjects at Higher or Ordinary Level in the Leaving Certificate including: Irish, English, Mathematics, a laboratory science subject (i.e. Chemistry, Physics, Biology, Physics with Chemistry (joint), Agricultural Science) or Technology and any two other subjects recognised for entry purposes.
Additional requirements:	**Leaving Certificate:** Minimum of Grade C3 in the Higher Level Leaving Certificate paper in Mathematics or alternatively obtain a pass in the Special Engineering Entrance Examination in Mathematics (see page 5). **A-levels:** A minimum of Grade C in A-Level Mathematics is required.
Duration:	4 years
Entry points Range:	430 - 625
A Level Grades:	See the following webpage for entry requirements www.nuigalway.ie/admissions/procedures/alevelapp.html
Average intake:	40

Course Outline

Year 1
- Engineering Calculus
- Engineering Mathematical Methods
- Engineering Mechanics
- Engineering Chemistry
- Engineering Physics
- Fundamentals of Engineering
- Engineering Graphics
- Engineering Design
- Engineering Computing

Year 2
- Human Body Structure
- Introduction to Biomaterials
- CADD and Design Project
- Introduction to Machine Design
- Electronic Instrumentation and Sensors
- Thermodynamics and Fluid Mechanics
- Materials
- Strength of Materials
- Mathematics and Applied Mathematics
- Engineering Statistics

Year 3
- Biomedical Design
- Human Body Function
- Principles of Biomaterials
- Mechanical Analysis and Design
- Fluid Dynamics
- Automated Systems
- Quality Systems
- Project Management
- Regulatory Affairs
- In semester 2 of third year, students undertake an 8-month work placement (see page 7).

Year 4
- Medical Implant and Device Design
- Biomechanics
- Medical and Surgical Practice
- Elements of Pathology
- Tissue Engineering
- Polymer Engineering
- Computational Methods in Engineering Analysis
- Thermodynamics and Heat Transfer
- Biomedical Engineering Individual Project

What Our Students Say...

Catherine O'Connor, Biomedical Engineering

This course has encouraged me to be innovative, develop my problem-solving skills and work as part of a team. I enjoy developing an idea. I have benefited from the hands-on experience acquired from the labs. This course has offered me the unique opportunity to study abroad at Purdue University as an exchange student due to a link developed between the two universities.

computer science & infomation technology all you need to know

Computer Science & Information Technology at NUI Galway, where imagination and knowledge combine

The exponential growth of digital information worldwide is staggering. Within the realms of computer science and information technology there are new problems to be solved and challenges to be met. There are new products yet to be designed and new technologies yet to be invented that will play a central role in our future lives. At NUI Galway, we will develop your enthusiasm and creativity and give you the scientific knowledge to be a part of this innovation.

The Computer Science and Information Technology programme at NUI Galway provides you with this foundation covering topics such as software engineering, operating systems and computer algorithms, as well as units that provide the technological skills that are in high demand throughout the growing IT industry including web and network technologies, multimedia and game programming.

We know that you have lots of questions about Computer Science and Information Technology, so to answer some of them we have listed your most frequently asked questions.

What is Computer Science and Information Technology?

Computer Science and Information Technology is the study of the design, exploitation and technology surrounding computing and includes information systems, software engineering, programming and artificial intelligence.

What will I learn?

By studying Computer Science and Information Technology it will mean that you will be studying a subject at the very forefront of technology and innovation. Computers are everywhere, and the demand to make them smaller, work faster, and have new and exciting software has never been greater. The focus will be on software engineering - things like database design, network systems, computer hardware and the internet. But there are other options in this field, such as artificial intelligence, cybernetics, multimedia, games design and apps design. Courses have a heavy practical emphasis, so you will learn how the professionals are doing things, and be taught by some of them. You will also get plenty of group work experience.

Do I need to be good at Maths?

You will be expected to be good at maths and an interest in physics would also help, as most of the theory will touch on both subjects.

What skills will it give me?

The practical nature of the programme will enable you to solve technology problems. You will learn how to analyse information and how to put the theory, often about large and complex systems, into practice. Graduates are equipped with the professional and interpersonal skills needed to work in the industry. You will develop teamwork, project-management skills and commercial awareness, as well as critical-thinking skills.

What jobs are there?

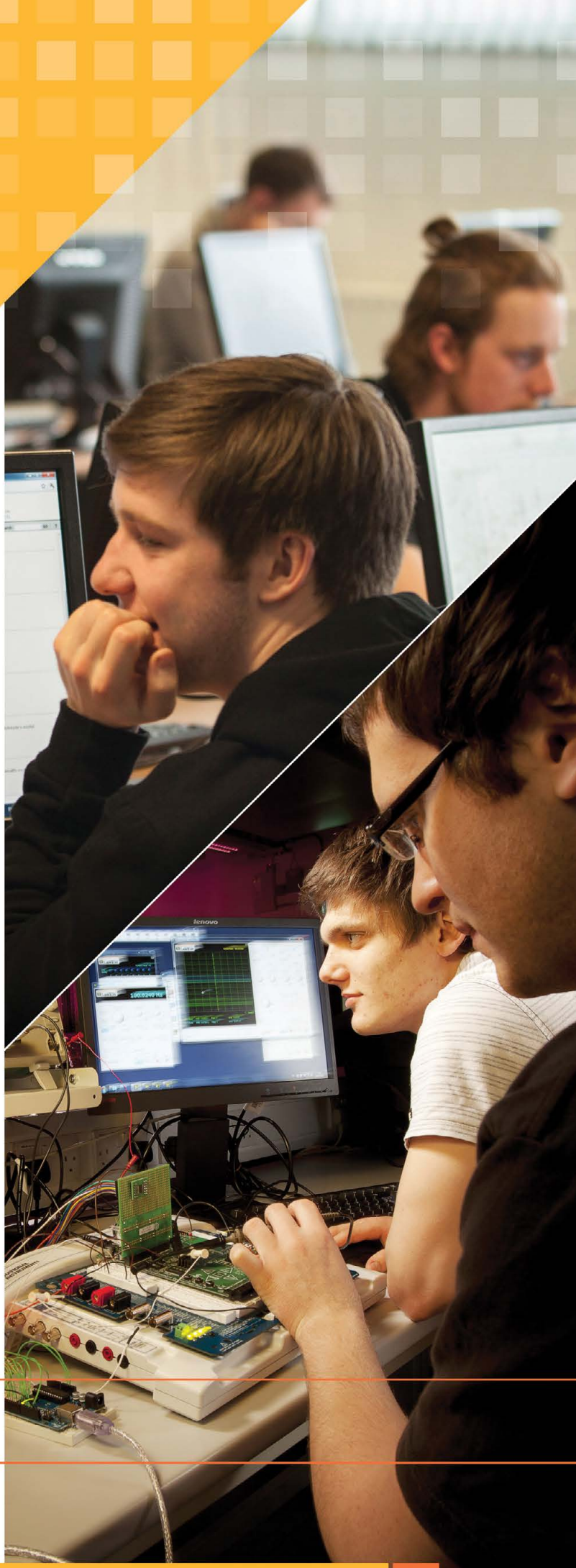
Computer Science and Information Technology graduates get jobs in technical fields, such as computer operations, computer systems sales and service, programming, software development, software engineering, or find work as analysts and programme writers. This could mean working in specific IT firms or in companies outside the industry that use computers as a core part of their job, perhaps managing the computing needs of an advertising firm's employees. You will graduate from NUI Galway bursting with ideas. After all, Google, YouTube and Twitter didn't just happen on their own.

Is it a good job?

There is a bright future for Ireland's Computer Science and Information Technology graduates. Nationally and internationally, the computing and telecommunications industries are experiencing phenomenal growth, with many different opportunities to develop a rewarding and fulfilling career. The potential for job variety is almost limitless, as people with IT skills are needed for positions in: software development, manufacturing, music recording, education, mass-media, and financial services.

Sounds interesting, how do I get into it?

Firstly, you need to consider whether you enjoy science and mathematics subjects, because many computer science and technology roles are based on the principles of those subjects. If you do you should make sure to study these subjects in your Leaving Certificate.



“what our computer science & information technology students say”

“The Computer Science and Information Technology degree offers a diverse range of subjects, such as programming, games development, artificial intelligence, networking and cloud computing. I worked as a Software Engineer in IBM for my Third Year placement, which gave me a broad insight into the many areas of IT. Working with a development team on a massive software product also gave me invaluable experience with working in a fast-paced environment with other programmers.”

Aaron Hastings,
Computer Science & Information Technology

“I chose Computer Science and Information Technology at NUI Galway as I have an interest in networking, digital imaging and databases. Lab work and workshops give me insights into how theory is applied. The lecturers are friendly and willing to help with any problems.”

John Gibbons,
Computer Science & Information Technology

"The student experience at NUI Galway is second to none. After 4 years studying in the discipline of Information Technology, I feel as though I could surmount any challenge that faces me. The logical thinking and reasoning that comes with programming and understanding computers is not only useful in the course, it's also very easy to translate to other aspects of life. The quality of the teaching in the College is fantastic. Technology is always advancing and as a result, all of the staff try to stay ahead of the curve, teaching useful and relevant material that keeps us up-to-date with all the new technology. I couldn't recommend this course more."

Tara Reapy,
Computer Science & Information Technology

"Computer Science and Information Technology is a fascinating and rapidly developing sector. At NUI Galway there are many friendly and supportive staff and students creating an enjoyable student experience. This programme offers students the perfect balance between theory and practical work, allowing you to develop both your knowledge and skills. Although challenging at times, it has also been an extremely rewarding course to study and one which I have thoroughly enjoyed."

Drew Farnon,
Computer Science & Information Technology

"I chose Computer Science and Information Technology at NUI Galway as I wanted to get the best education in all areas of ICT. The discipline of IT has world class facilities and a friendly and welcoming environment. Students are in touch with lecturers on a one-to-one basis and many innovative technologies are used to help us learn. I am really looking forward to the rest of my time here and would recommend and advise anyone to do this programme."

Aaron Lynch,
Computer Science & Information Technology

GY350

Bachelor of Science

Computer Science and Information Technology

Course Overview

Computer Science and Information Technology covers the theory and practice of designing and developing computer systems, both hardware and software, as well as networking and telecommunications technologies.

The programme uses electronic devices, such as computers and mobile phones, computer software and networks to store, process, transmit, retrieve and manipulate information. It has a flexible course structure, where students can choose to study a range of Next-Generation Technology such as: Digital Media and Games, Enterprise Informatics, Energy Informatics, Computational Mathematics, Scientific Computing and Medical/Medical informatics. These core subjects provide a solid theoretical and applied background in Computer Science and Information Technology.

Career Opportunities

Ireland has a strong international reputation as a hub for the technology industry. According to the Organisation for Economic Cooperation and Development (OECD) we have one of the highest concentrations of ICT activity and employment. International IT giants, from Google and Facebook to Intel have chosen Ireland as a base for their activities.

Computer Science & Information Technology graduates are highly skilled and are equipped to take on employment as professional engineers, designers and consultants in a range of organisations, specialising in areas such as software design and development, digital media and games, IT consultancy, telecommunications and medical informatics.

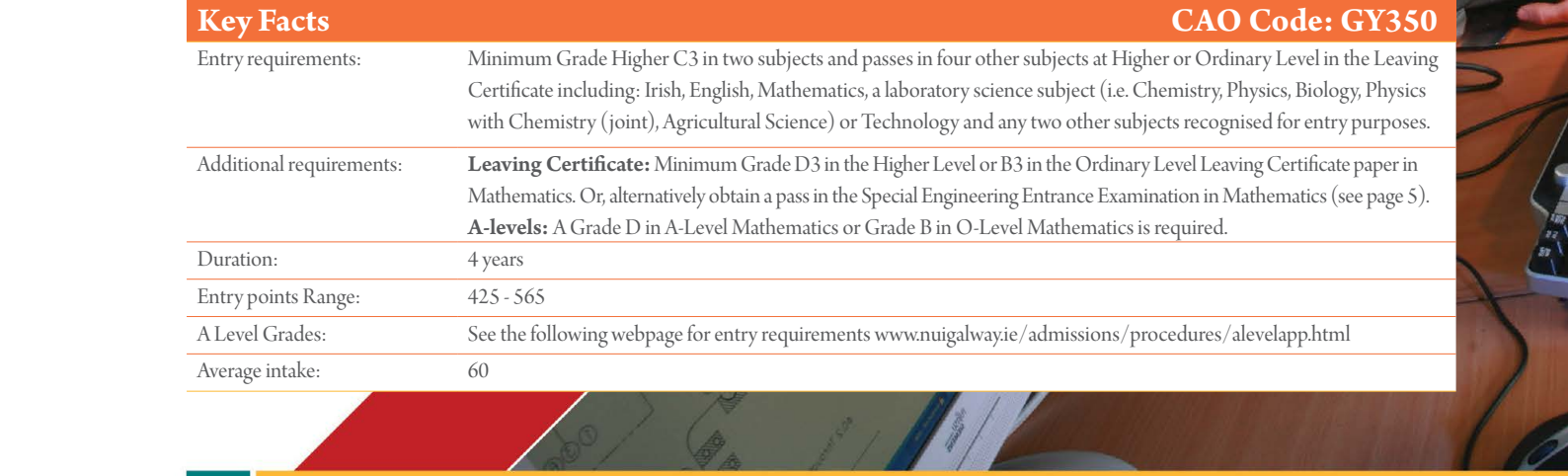
The ICT sector is of strategic economic importance to Ireland and the overall picture is of a vibrant sector which is forecast to increase in employment over the coming years.

Further Education

Suitably qualified applicants can further their study to postgraduate level by applying for one of the many excellent postgraduate options available at NUI Galway.

Find Out More

Computer Science and Information Technology
T: +353 91 493 143
E: info@it.nuigalway.ie
http://www.it.nuigalway.ie/



Key Facts	CAO Code: GY350
Entry requirements:	Minimum Grade Higher C3 in two subjects and passes in four other subjects at Higher or Ordinary Level in the Leaving Certificate including: Irish, English, Mathematics, a laboratory science subject (i.e. Chemistry, Physics, Biology, Physics with Chemistry (joint), Agricultural Science) or Technology and any two other subjects recognised for entry purposes.
Additional requirements:	**Leaving Certificate:** Minimum Grade D3 in the Higher Level or B3 in the Ordinary Level Leaving Certificate paper in Mathematics. Or, alternatively obtain a pass in the Special Engineering Entrance Examination in Mathematics (see page 5). **A-levels:** A Grade D in A-Level Mathematics or Grade B in O-Level Mathematics is required.
Duration:	4 years
Entry points Range:	425 - 565
A Level Grades:	See the following webpage for entry requirements www.nuigalway.ie/admissions/procedures/alevelapp.html
Average intake:	60

Course Outline

Year 1
- Computing Systems
- Algorithms & Information Systems
- Fundamentals of Electrical & Electronic Engineering
- Programming
- Principles of Physics
- Mathematics
- Next-Generation Technologies

Year 2
- Software Engineering
- Professional Skills
- Computer Systems and Organisation
- Database Systems
- Statistics
- Programming
- Networks and Communications

Year 3
- Software Engineering and Project Management
- Programming
- Networks and Communications
- Databases Systems
- In semester 2 of third year, students undertake an 8-month work placement (see page 7)

Year 4
- Final Year Project
- Software Engineering
- Distributed Systems and Co-Operative Computing
- Advanced Professional Skills
- Real Time Systems
- Artificial Intelligence
- Machine Learning and Data Mining

What Our Students Say...

Alan Cunningham,
Computer Science and Information Technology

I chose the IT undergraduate course because I was interested in technology and the software behind it. I was challenged to think creatively to solve problems and discovered how systems that are incorporated into everyday life work. I also met many people who shared similar interests and we were able to incorporate these into various class group projects, which included music, computer games and artificial intelligence. The degree has led me to postgraduate research in artificial intelligence in NUI Galway.

NUI Galway
OÉ Gaillimh

Find out more about the undergraduate programmes at the College of Engineering and Informatics at:

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