Planning your Career in Engineering

Biomedical Engineering
Chemical & Bioprocess Engineering
Civil Engineering
Electrical/Electronic Engineering
Energy Systems Engineering
Mechanical Engineering

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UCD Career Development Centre
www.ucd.ie/careers
Session Objectives

By the end of today's session you should be able to:

• Better understand careers in engineering

• Understand how to make a personal career plan
Careers in Engineering
What is an Engineer?
An Engineer is someone who....

- Turn ideas into reality
- Solve problems
- Create designs
- Use scientific knowledge
- Applies knowledge to real world
Lots of Types of Engineer....

- Biomedical Engineer
- Biosystems Engineer
- Civil, Structural & Environmental Engineer
- Electrical Engineer
- Energy Engineer
- Electronic and Computer Engineer
- Energy Systems Engineer
- Mechanical Engineer
- Chemical Engineer
- Aerospace Engineer
- Materials Engineer
- .......

...however also overlap and mobility within disciplines
National Skills Bulletin 2015

Growth Sectors:

• Environmental Engineering
• Utilities
• Power
• Clean Technology

Shortages:

• Production & Process Engineering, Process Automation & System Control, CAD, CAM, Production Planning & Supply Chain Management
• Product Development & Design Engineering
• Electrical Engineering
• Electronic Engineering
• Chemical Engineering for specialised roles in biotech/pharma industry
Where do Engineers work?

- Manufacturing and Industry
- Pharmaceutical, Chemical & Medical Devices Technologies
- Electronic, Computing & Telecommunications
- Construction & Civil

Lots of cross over and mobility is possible in Engineering roles!
What roles do Engineers have in these sectors?

- Design
- Research & Development
- Production
- Quality
Manufacturing & Industry

Biggest area of employment

Areas Include:
- Aerospace
- Agricultural Machinery
- Process Engineering and Instrumentation
- Food & Drink
- Chemicals, Pharmaceuticals and Plastics
- Electrical, Electronic & Microelectronic and precision instruments

Most common disciplines:
- Mechanical Engineering
- Electrical/Electronic Engineering
- Manufacturing Engineering
Most of the top international organisations have operations in Ireland

Areas Include:
- Chemical & Pharmaceutical
- Medical Devices & Medical Technologies

Most common disciplines:
- Mechanical Engineering
- Chemical & Bioprocess Engineering
- Biomedical Engineering
Electronic, Computing & Telecommunications

Rapidly growing area

Areas Include:
• ICT & Telecoms
• Electronics

Most common disciplines:
• Electronic Engineers
• Computer Engineering
• Software Engineering
• Systems Engineering
Construction & Civil

Areas Include:
• Civil Engineering
• Building Services Engineering

Most common disciplines:
• Civil/Structural Engineering
• Environmental Engineering
• Mechanical Engineering
• Electrical Engineering
Starting salary
- Approx. E32,000

In demand:
- 20% employers reported shortage
- 28% of employers indicated they are hiring more candidates in the next campaign compared to the last

Excellent employment rates
- Unemployment rate half that of national average (5% vs 10%)

Roles in Ireland and Abroad
- 170 multinational engineering firms in republic

However...Market becoming more competitive
- Graduates need to meet more specific criteria and display more particular skills to stand out
The ‘perfect’ applicant

- Work experience
- Understands the role/company/sector
- Engaged with their community
- Academic achievement
- Transferable skills
*The Structural Engineering with Architecture Programme is direct entry (3 BSc & 2 ME)

Year 1

Year 2 & 3*

* You may exit after year 3 with a BSc Engineering Science.

Year 4 (BE)

*The 4 year BE Chemical & Bioprocess Engineering is professionally accredited to Masters level by IChemE

Year 5 (ME)
In Class Exercise

Initial Choice

- Biomedical
- Chemical & Bioprocess
- Civil
- Electrical/Electronic
- Mechanical
The application of traditional engineering principles to healthcare and medicine - think of the brain and nervous system as a large communication system which co-ordinates and transmits signals around the body, and the organs and limbs as sophisticated engineering systems that control functions such as movement, respiration and blood flow.

Strong foundation in electrical, electronic and mechanical engineering plus an understanding of physiology and anatomy.

If you are interested in developing new medical techniques, systems and devices, and you want to be involved in the breakthroughs that are improving the healthcare system for doctors and patients every day, then this is the course for you.

Graduates can find employment in: The Medical Technologies Industries, Pharmaceutical Industries, Medical Device Design, Rehabilitation Engineering, Device Manufacturing, Regulation, Engineering Consultancy

Source: www.ucd.ie
Chemical and Bioprocess Engineers are concerned with the transformation of matter and energy into products and services. Examples of products include petrochemicals, (bio)pharmaceuticals and nano-materials. Examples of services include energy supply (from carbon-based to renewable resources), clean air and CO2-sequestration.

As a Chemical & Bioprocess Engineer you’ll use the sciences as the basis for understanding these transformations; you’ll apply mathematical and engineering principles to realise them on the appropriate scale.

Would suit if you seek invention, and want to work at the interface between the sciences, mathematics and engineering, with a broad and well-paid portfolio of career opportunities.

Source: www.ucd.ie
Civil Engineering

The design, construction and maintenance of the physical and naturally built environment. It includes the design of bridges, buildings, roads and dams, and works relating to management of our water resources. This work incorporates environmental protection; large-scale construction projects; ensuring the provision of safe drinking water; designing and implementing strategies for treating wastewater and pollutants; development of transport infrastructure; flood prevention; and the design of foundations for different ground conditions.

Core areas of structural design, water and environmental engineering, transport engineering and geotechnical (soil and foundation) engineering.

Graduates can find employment in: Environmental industries, Transportation engineering, Water resource and hydraulic engineering, Management and project management, Financial services, Research.

Source: www.ucd.ie
Electronic or electrical engineers use creative ways to **generate and handle electricity and information**. They have developed the technologies we use to listen to music and communicate with one another, including smartphones and the Internet.

Electrical and electronic engineers are also developing new ways to solve the world’s energy problems by harnessing renewable energy sources like wind and ocean energy.

**Career & Graduate Study Opportunities:** You could be involved in projects that make a difference to the world, e.g. harnessing new sources of energy or developing advanced digital technologies.

Exciting opportunities exist in areas such as designing new means of communication or the next generation of multimedia devices, studying the human brain, working with electrical energy systems or developing new imaging techniques.
Mechanical engineers help to improve our world. We face unprecedented challenges, from understanding climate change, to managing global mobility, to finding sustainable growth pathways for the burgeoning population in the developing world. Mechanical Engineering in UCD provides you with the education, skills and knowledge you’ll need to understand the challenges, and help to develop the new solutions we need.

Working in areas ranging from energy to aerospace, biomedicine or manufacturing, mechanical engineers are changing our world for the better. They create new solutions, integrate disparate technologies, increase energy efficiency, reduce our consumption of natural resources and minimise our impact on the local and global environment. If you want to help forge a path to a brighter future, Mechanical Engineering at UCD is the place for you.

Opportunities are extraordinarily diverse, making graduates highly resilient to changing economic circumstances.

Recent graduates are currently employed in: Energy, Biomedical, Aeronautical, Automotive and Manufacturing Sectors, IT companies, Management and Project Management.

Source: www.ucd.ie
Career Planning
Know Yourself

Take Action

Explore Opportunities

Decide what to do

Based on the **DOTS model** by Law, B. and Watts, A.G. (1977)
Know Yourself
## Questions to Ask Yourself

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What technical skills or abilities do you have?</td>
<td></td>
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<tr>
<td>What transferable skills do you have e.g. problem solving, presentation skills?</td>
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<tr>
<td>What modules or extracurricular activities do you enjoy?</td>
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<tr>
<td>What kind of personality do you have e.g. outgoing, reserved..</td>
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<tr>
<td>What kind of environment would you like to work in?</td>
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<tr>
<td>What are your values?</td>
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</tbody>
</table>
Try Psychometrics Tests

https://www.profilingforsuccess.com/cgi-bin/hpfs_assessments.pl

Login Details:

Client Code: tflhe

Access Code: ucd

Password: ucd4
Know Yourself

Think about:
- your skills
- values
- interests
- personality preferences

Do psychometric tests

Talk it over & make notes

Use these to create a set of criteria you want a job to meet
At Home Exercise
### Identifying Your Work Values

**Work Values Exercise**

<table>
<thead>
<tr>
<th>Work Value</th>
<th>Rank order</th>
<th>Priorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACHIEVEMENT</td>
<td></td>
<td></td>
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<tr>
<td>PRESTIGE RECOGNITION</td>
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<tr>
<td>AUTHORITY / RESPONSIBILITY</td>
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<tr>
<td>PERSONAL GROWTH</td>
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<td>AUTONOMY / INDEPENDENCE</td>
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<td></td>
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<tr>
<td>SOCIAL INTERACTION</td>
<td></td>
<td></td>
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<tr>
<td>RISK TAKING</td>
<td></td>
<td></td>
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<tr>
<td>ECONOMIC REWARD</td>
<td></td>
<td></td>
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<tr>
<td>VARIETY</td>
<td></td>
<td></td>
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<tr>
<td>INTELLECTUAL CHALLENGE</td>
<td></td>
<td></td>
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<tr>
<td>SOCIAL GOOD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CREATIVITY</td>
<td></td>
<td></td>
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<tr>
<td>PHYSICAL ENVIRONMENT</td>
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<td></td>
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<tr>
<td>JOB SECURITY</td>
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<tr>
<td>WORK LIFE BALANCE</td>
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</table>

- Rank each value from 1 - 15, based on what's most important to you right now.

- Think about what types of roles or environments might best fit these values.
Explore Career Pathways
Know Yourself

Explore Opportunities

Take Action

Decide what to do

Based on the **DOTS model** by Law, B. and Watts, A.G. (1977)
• Start from the End Goal...... and then work backwards

• “In 10 years I would like to be a __________”

• Once we have an end goal, we can create steps to achieve this
Do Your Research

Start with Online Research

Then Start Talking to People
Useful Websites To Get Started

www.gradireland.com

www.prospects.ac.uk
Research
Career Sectors
Career Sector Overviews

- Accountancy and financial management
- Agriculture, animal and plant resources
- Banking, insurance and financial services
- Charities and voluntary sector
- Construction, civil engineering and QS
- Emergency services and armed forces
- Engineering
- Environment and natural resources
- Fund management, administration and investment banking
- Hospitality, sport, leisure and tourism
- Human resources, recruitment and training
- IT and telecoms
- Languages and culture
- Law, legal services and patents
- Marketing, advertising and PR
- Media and publishing
- Medical and healthcare
- Performing and creative arts
- Property
- Public sector and civil service
- Retail, sales and customer services
- Science, research and development
- Social, community and youth
- Teaching and education
### Career Sector Overviews

<table>
<thead>
<tr>
<th>Sector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountancy, banking and finance</td>
<td></td>
</tr>
<tr>
<td>Business, consulting and management</td>
<td></td>
</tr>
<tr>
<td>Charity and voluntary work</td>
<td></td>
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</tbody>
</table>
Research

Jobs Related to Your Degree
Jobs with your degree

While your degree may lead you in a particular direction, be aware that there are other paths open to you as well. Careers advisers estimate that about 40 per cent of vacancies advertised for graduates do not ask for specific degree subjects. In fact, many employers will be more interested in your personal skills and abilities than your degree discipline.

So, if your degree is not in an obviously vocational subject, or if you want a change, don’t worry. Most graduates will find that their studies have given
What can I do with my degree?

- Accountancy and finance
- Aerospace engineering
### Other People With Your Degree

**University College Dublin**

<table>
<thead>
<tr>
<th>Where they live</th>
<th>Where they work</th>
<th>What they do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ireland</td>
<td>AIB</td>
<td>Finance</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Bank of Ireland</td>
<td>Sales</td>
</tr>
<tr>
<td>United States</td>
<td>PwC</td>
<td>Operations</td>
</tr>
<tr>
<td>London, UK</td>
<td>EY</td>
<td>Education</td>
</tr>
<tr>
<td>Singapore</td>
<td>Google</td>
<td>Research</td>
</tr>
</tbody>
</table>

- Kevin Haines: UCD Agriculture, Communications Technology Recruitment Consultant at Ingashe Ireland.
- Mick Moran: Assistant Director at INTERPOL Lyon Area, France.
- Richard Ross: Cyber Forensics Contractor at Bank of America Merril Lynch London, United Kingdom.

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LinkedIn Banner: One Day Masterclasses - Innovation, Corporate Governance, & Organisational Renewal - book now.

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Add to board
Suggest
364 interested in attending
LinkedIn for Education
Change university

102,170 results
Search this set
Attended
1900 to 2016
Show More
Research
Job Profiles
Chemical Engineer

Chemical engineers work in a vast range of scientific fields from water and waste water treatment to petrochemicals to generating electricity from biomass to producing our food and drinks to cosmetics and textiles… to name just a few!
Job profile

Actuary

As an actuary, you'll learn how to analyse data, evaluate financial risks, and communicate this data to non-specialists...

An actuary evaluates, manages and advises on financial risks. They use their skills to identify risks to health, life, property, credit and other areas of financial concern. An actuary calculates the cost of potential losses, and helps to define strategies to control or reduce these costs. They usually work as part of an actuarial team, which may also include actuaries.
People with Interesting Job Titles
Professional Bodies
Exercise
Look up “Jobs with my Degree” for a potential degree pathway

- Skills needed?
- Typical employers?
- Professional bodies?
Next Step:
Talking to people / getting work experience
Who Do I know/Who Can I Talk to?

- Use existing contacts/alumni - Ask to be introduced to people you want to meet
- Employer events/networking events
- Recruitment Fairs e.g. CareerZoo
- Industry events – join your relevant professional association
- Meet people for coffee
What Questions Could You Ask?

- What does a typical day look like?
- Do people find it difficult to get into the industry?
- What are the working conditions like?
- What advice do they have for you?
- How can you get some experience in this area e.g. work shadowing, internships etc.?
- Whatever question are important to you- based on your self awareness?
Decision Making
Discuss your career options based on qualifying as either a Biomedical Engineer, a Chemical & Bioprocess Engineer, a Civil Engineer, an Electrical/Electronic Engineer or a Mechanical Engineer.

Select 2 – 3 of these options based on your interest/enjoyment in the subject.

Go online and research careers relating to these 2 – 3 options.

Consider the fit between yourself and the job profile.

See if you can make contact with someone working in these areas or gain work experience or exposure to the likely working environment.

Discuss your options with family, friends, career consultants..
UCD Career Development Centre Online

http://www.ucd.ie/careers  UCD Careers Connect  @ucdcareers  facebook.com/ucdcareers