



DCU Futures
Reimagining Undergraduate Education for an Unscripted World

DCU
Ollscoil Chathair Bhaile Átha Cliath
Dublin City University



Riailtas na hÉireann
Government of Ireland

HCI Human Capital Initiative

Overview

DCU is transforming its undergraduate curriculum in order to ensure that current and future students enjoy a unique learning experience that will empower them to thrive in an increasingly unscripted world, defined by rapid social and technological change. As the boundaries of knowledge continue to expand, we recognise that the manner in which students learn will be key to their development and ability to engage effectively and impactfully with new knowledge and emerging technologies. Our objective is to create a radically different, highly innovative undergraduate learning experience that will foster the development of capable, engaged graduates who can play a pivotal role in advancing Ireland's future prosperity.

Through our 'DCU Futures' initiative, we are transforming the educational experience of undergraduate students by reconceptualising their learning experiences, creating authentic connections between the classroom and enterprise, and embedding digital literacies, disciplinary competencies and key transversal skills that will enable our graduates to thrive. We are joined in this project by a strong consortium of enterprise partners, representing key employment sectors in the Irish economy. This highly innovative project, funded under the Irish government's Human Capital Initiative (HCI) supported by the National Training Fund, will deliver on our ambition to reimagine undergraduate curricula through a combination of innovative teaching and learning approaches, enhanced use of technology, and deep industry engagement.

In considering what students should learn, we have identified specific areas where graduates with discipline knowledge and key transversal skills areas are increasingly required. These new courses have been informed by ongoing consultation with enterprise partners and with reference to national strategies including Future Jobs Ireland 2019 and the National Skills Strategy 2025. The identified courses have been designed to meet these national skills priorities and to ensure that our students and graduates are in-demand by industry. Read on to find out more about our ten innovative new courses



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BSc in Digital Business and Innovation

(Entry via DC241)



Digital technology is ubiquitous in business today. It would be hard to think of a sector in which businesses are not undergoing digital transformation, learning how to turbo-boost their performance by harnessing artificial intelligence, mobile computing and augmented reality among other technologies.

To compete and thrive in a dynamic but uncertain global marketplace, businesses are calling out for innovative thinkers with true digital fluency. They need managers and analysts who have an understanding of the key technologies and a practical knowledge of how to apply them, also with the vision to understand how new and emerging tech can both transform and underpin business strategy.

Approach

DCU Business School has drawn on its existing deep expertise in innovation and digital business technologies to create this award winning course, the first of its type in Ireland.

The course will give students the knowledge and skills to use emerging digital technologies to develop or re-imagine products and services, and to transform business processes. Students will learn how to identify problems and ask the right questions, while being mindful of bigger picture business objectives and societal challenges. To address and embrace change, students will also develop the capacity for self-reflection and life-long learning.

Ways of Learning

With this course, students will learn about, through and with technology in an industry-relevant way. DCU Business School is working with industry partners to innovate the curriculum. It closely replicates real, fast-paced workplace environments, meaning the ways students learn is often quite different to traditional lecture environments. The course also moves away from traditional modes of assessment (e.g. terminal end of semester examinations).

There are touchpoints with industry throughout the year, including hackathons, design sprints, mentoring relationships, and immersive learning experiences in which students are given real world business challenges or opportunities to sense-check ideas and solutions.

The course is also unique in that includes an annual module devoted to self-transformation, geared at enabling students to learn how to engage in reflection and lifelong learning. As is typical in DCU, students will spend their third year working on an INTRA (work experience) placement.



Truly Future Ready Graduates

No matter what careers today's university graduates pursue, they will have to engage with digital technologies. Graduates from this course will be fluent in these technologies, while also trained to be agile decision-makers and adaptable problem-solvers.

The course has been designed to ensure that graduates will be proactive innovators, capable of seizing opportunities and confronting any challenges they encounter. Smart, versatile, strategic thinkers are and always will be sought after in the world of business.

Digital Business and Innovation: Areas of Learning

- Cloud computing, big data, virtual reality and much more
- Digital business models
- Digital change and transformation
- Failure
- Digital eco-systems

Skills

- Innovation and creativity
- Critical thinking
- Problem solving
- Leadership and management
- Teamwork and collaboration
- Personal agility

Careers

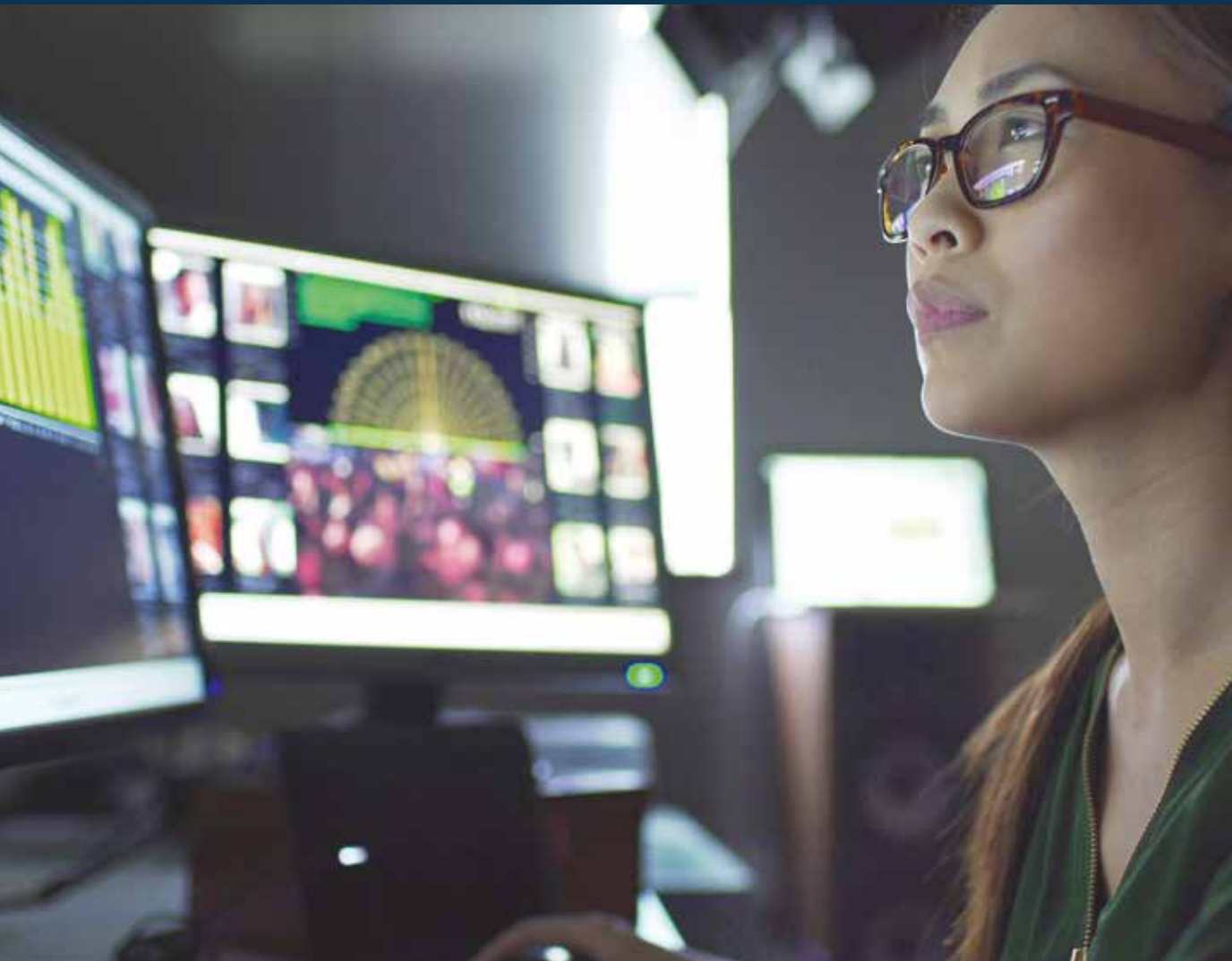
DCU has always sought to produce work-ready graduates and that is especially the case here, as this course has a decidedly contemporary curriculum. Graduates will be able to choose from an array of key roles in any business or industry where their expertise will be needed to support digitalisation and digital transformation initiatives.

Future roles include, but are not limited to, consultant, digital business analyst, entrepreneur, digital innovation executive, intrapreneurship, digital project manager and digital transformation architect.



BSc in Psychology and Disruptive Technologies

(Entry via DC210)





With a focus on psychology and technology, our new degree is an industry-facing, future ready course. It is designed for leaders and entrepreneurs of the future. We are bringing together two highly-regarded disciplines to create an exciting new degree course that will give students a unique perspective on how technology can be utilised for human benefit. Students will gain insight into the core areas of both disciplines, allowing them to be at the forefront of their field.

With a focus on human-first technology rather than technology driven products, graduates of this course will gain the necessary skills to position themselves ahead of the technological curve. Students are taught by world-leading academics and will be learning alongside some of the brightest minds in psychology, AI and computing. Participants on this course will combine their interest in people with their interest in technology, and will be equipped with the skills to use both to solve real-world problems.

Bold Integration of Psychology, Innovation and Technology

Disruptive technologies are new, game-changing technologies that completely enhance or eliminate existing, and/or create completely new solution spaces for societal problems with big (typically economic) impacts. For example, the web disrupted communications and information diffusion, Southwest airlines disrupted travel, Netflix disrupted Blockbuster video rental, remote diagnostics is now disrupting health, artificial intelligence and automated decision making disrupting education and so much more.

With just a few keywords, an artificial intelligence application generated the above paragraph in only 15 seconds! Artificial intelligence and cognitive technologies are at

the forefront of disruptive technologies that enhance human thinking, decision making and behaviour. For anyone fascinated by the interplay between psychology and disruptive technology, and keen to pursue a career in either or a combination of both, this is the perfect university course.

Students will learn how to assess the risks and benefits of a new technology, and to query if something should be done just because it is technologically possible to do so.

Ways of Learning

As might be expected for a course dealing with cutting-edge transformative thinking, the way students learn will be fundamentally different. Formats include live or recorded online sessions followed by in-person learning activities; some of which include challenge based learning such as hackathons, and datathons.

Industry partners are heavily involved in creating and delivering some of the course content, particularly when students will engage in immersive learning environments such as hackathons that will mirror real-world challenges. The course has also been designed to ensure that some of these challenges will cross modules and disciplines, to deliver an integrated experience similar to how problem solving works in real industry.



Future-focused Learning

As a society, it is remarkable how we have pivoted to online life. Artificial intelligence and smart algorithms already power many of our decisions and much of our work. This will only increase in time and as psychologists are behind much of the development of disruptive technologies, graduates from this course will be well equipped to become leaders at the forefront of this emerging field.

Furthermore, graduates will have a solid grounding in technology, such as databases, robotics and machine learning, which will continue to stand to them in the years to come.

Psychology and Disruptive Technologies: Areas of Learning

- Development and lifespan psychology
- Biological psychology and neuropsychology
- Social psychology
- Cognitive psychology
- The psychology of individual difference
- Statistical reasoning
- Programming
- User interfaces
- Data analysis and visualisation
- Artificial intelligence and machine learning
- Ethics and disruptive technologies

A Skillset for Disruption

- Critical thinking
- Problem solving
- Collaboration and teamwork
- Data visualisation
- Communication skills

Career Options

This course has been designed to support the accelerated development of interdisciplinary and entrepreneurship expertise in Psychology and Computing from the time students graduate rather than having to pursue postgraduate degrees or extensive in-house training. Graduates will be equipped to work in a myriad of sectors including technology itself, healthcare, education, business and entrepreneurship.

Similar to other accredited Psychology degrees, students also have the option to pursue a postgraduate qualification in psychology if they wish to become professional psychologists.

BSc in Psychology and Mathematics

(Entry via DC207)



Most people, if asked to list the core skills of a psychologist, might not immediately think of mathematics. As it happens, however, psychologists use statistics to manage and analyse data about human behaviour.

New technologies have turbocharged the amount of data psychologists can collect to underpin their work. More complex analysis on that data helps to develop individuals, small groups, whole organisations and communities.

Powering Psychology with Data

This integrated psychology and mathematics course gives students advanced numeracy and analytical skills, while also equipping them with a psychologist's understanding of human behaviour.

Graduates will be able to apply their mathematical skills to interpret data around how humans think, act, react and interact. Graduates will not only be able to produce complex data models, but also to interpret them through the lens of psychology, meaning they can bring real value to strategic, operational and human-focused decision-making when they enter the world of work.

Ways of Learning

This course has been designed to develop highly skilled industry-ready graduates and industry partners will be involved throughout, helping to steer immersive learning experiences. These will include hackathons and learning sprints, during which students will work intensively to solve real-world problems and generate new ideas.

In third year, students will complete an INTRA (work experience) placement which could be in any number of sectors, including neuroscience, finance, organisational and corporate psychology, education, health and wellbeing, industry and community organisations.

In Demand into the Future

Skills students will gain include becoming adept in understanding human thoughts, feelings, motivations and actions, critical thinking, problem-solving, advanced numeracy, and data modelling and visualisation skills, which in itself will mean they'll be highly sought after by employers. This course will also train students to be able to act as a bridge or translator between the person and increasingly broad and complex data relating to that person that ultimately powers decision-making.

Psychology and Mathematics: Areas of Learning

- Development and lifespan psychology
- Biological psychology and neuropsychology
- Social psychology
- Cognitive psychology
- The psychology of individual difference
- Calculus
- Probability
- Computing
- Statistics
- Data analysis



Career-ready Skills

- Critical thinking and reasoning skills
- An understanding of human behaviour
- Problem solving
- Data analysis
- Data visualisation
- Communication skills
- Research methods
- Teamwork and collaboration

A Wide World of Careers

This course has been designed to prepare students for a number of possible career paths after graduation. While some students will continue on to higher degrees, others will find specialised roles in sales and marketing, financial services, human resource management, business, consultancy and education without the need for postgraduate degrees or extensive in-house training.

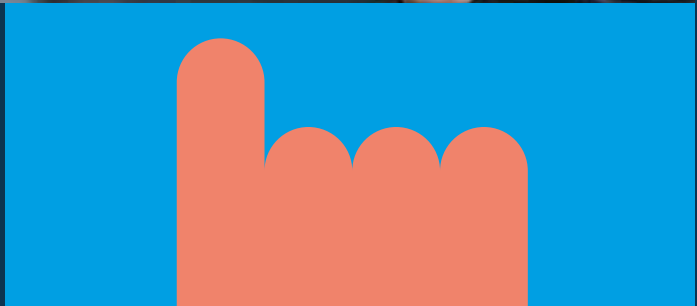
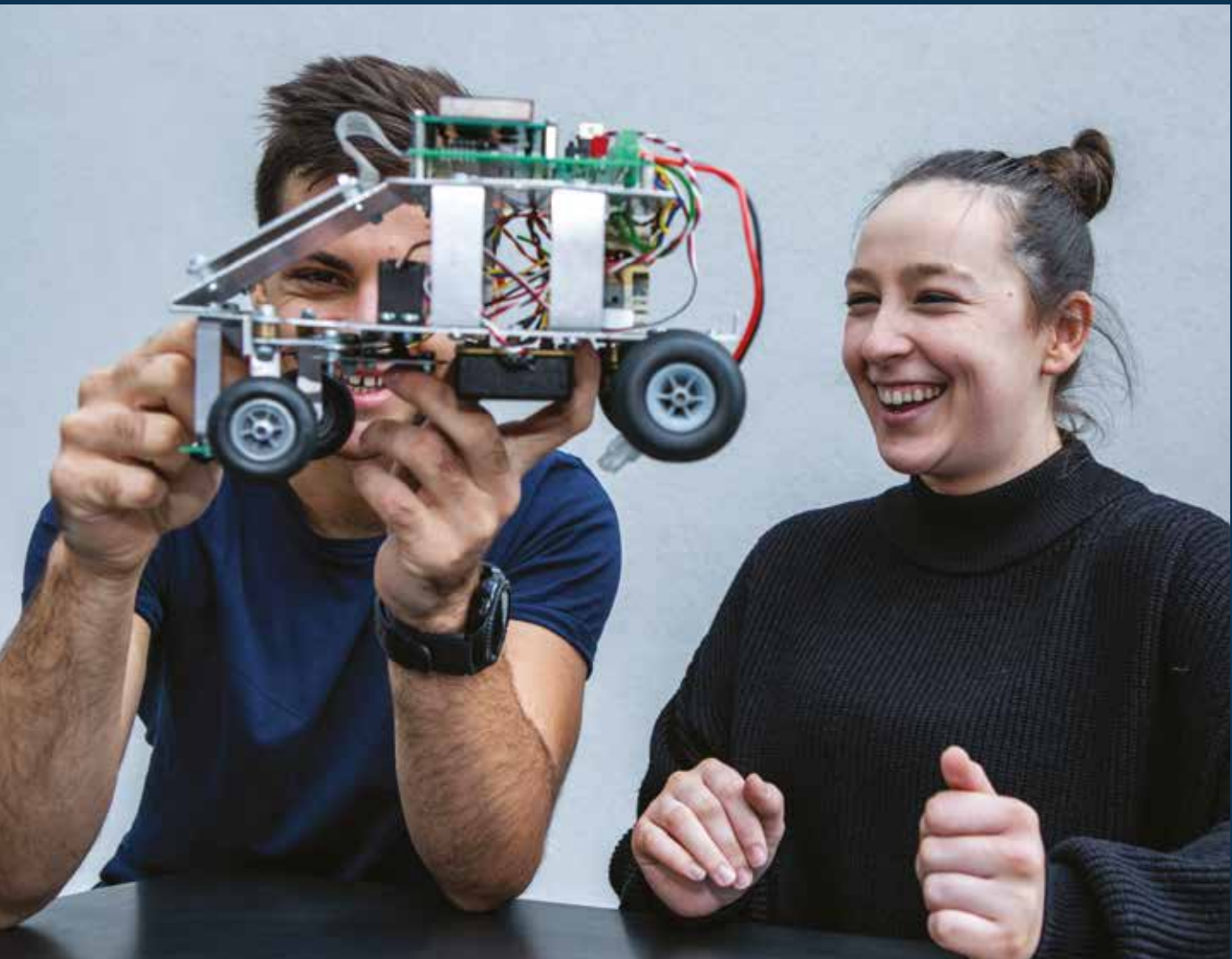
Graduates can apply to train professionally as a psychologist after successfully completing this degree (pending Psychological Society of Ireland accreditation).

The course also provides a pathway to a postgraduate qualification in teaching. With appropriate choices of final year modules, graduates will meet the requirements of the Teaching Council in relation to Mathematics.



BEng in Mechanical and Sustainability Engineering

(Entry via DC194)



Transitioning to zero carbon is one of the biggest challenges faced by humanity. Students who do this innovative course will be ready to tackle the huge challenges thrown up by climate change, while also being mindful of the environmental impact of any engineering work they do.

This course merges practical engineering with theory. It provides rigorous engineering training and will be accredited by Engineers Ireland, but it also encompasses extensive learning around climate and sustainability issues.

For students who care deeply about the environment, but would also like to graduate from university as a mechanical engineer with additional skills in sustainability, this is the perfect course.

Truly Sustainable Engineering

While this course offers students the opportunity to specialise in sustainability, it also provides rigorous engineering training. It also encompasses extensive learning around climate and sustainability issues.

Industry partners will be involved throughout, lending their expertise and advice to reviewing module content, mentoring students and setting assessments. Students have the option to study a language, can spend some time studying overseas, and all students will complete a paid INTRA work placement in third year.

Engineering a Better Future

This course has been carefully planned to ensure it produces industry-ready graduates who are prepared to tackle some of the huge challenges thrown up by climate change, while also being mindful of the environmental impact of any engineering work they do.

Industry partners are keen to share with students the breadth of potential roles for which they would be suited while they also

play an active role in creating and developing the course material and will join in workshops, challenge-based learning and other aspects of the course.

This course offers a strong balance of practical engineering experience and theory. Students will learn through immersive challenge-based learning while also using new technologies to engage in online tutorials and collaborative peer learning. They will get plenty of hands-on experience in building and making mechanical systems in DCU's cutting-edge engineering labs.

Mechanical and Sustainability Engineering: Areas of Learning

- Energy systems: power systems, buildings, transport
- Thermofluid sciences
- Water and waste management
- Environmental standards and risk
- Process design and modelling
- Energy management
- Mathematics and computing
- Mechanics and mechanics of materials
- Sustainable design and manufacture
- Project management and professional development



Skill Set for World-saving

- Innovation and creativity
- Leadership and management
- Project and quality management
- Professional development
- Teamwork and collaboration
- Fostering diversity and inclusivity

A Breadth of Career Options

There is huge demand for well-rounded mechanical engineers with a finely tuned understanding of environmental standards and issues. Graduates will find employment not only in sectors such as transport and energy, but also across multiple sectors such as food and beverage, pharmaceuticals and semiconductors, in utilities, and in other design and manufacturing businesses where engineers are needed to design and maintain complex mechanical systems that are truly sustainable.

Our Engineering degree courses have international recognition through agreements with Engineers Ireland. This enables graduates to practice as professional engineers in many countries, both in the EU and in the signatory countries to the Washington Accord. Current signatories to the Washington Accord include: Australia, Canada, Hong Kong, Ireland (Engineers Ireland), Japan, New Zealand, Singapore, South Africa, The UK & The USA.

Typical graduate roles include

- Process Engineer
- Sustainability Engineer
- Sustainable Industrial Designer
- Renewable Energy Engineer
- Energy Audit Engineer
- Project Manager
- Energy Analyst



BA in Climate and Environmental Sustainability

(Entry via DC294)



Climate change is not only the defining issue of our generation but also of the next generation. Humans have caused so much damage and disruption to our global environment that our own existence is now at stake, as are those of many animals and natural habitats around the world. It is vital that humanity acts to address this issue, and the world needs trained experts who can help.

This course will be of interest to those students who are deeply concerned about climate change and our environment, and who are fascinated by how we affect the landscape and how the landscape affects us.

Taking a Multi-faceted Approach

This applied geography course takes a dual approach that is not just about understanding climate change and its consequences, but also about understanding how the environment itself offers solutions. Students will learn how to prioritise and implement nature-based solutions, which could involve, for example, supporting biodiversity or natural land use such as retaining flood plains.

One factor that distinguishes this course is how it encompasses different disciplines. Not only will students learn topics such as physical geography, climate science and biogeography, but they will also study the social aspects of climate change and become skilled in data analysis. Working geographers must be data-literate as they use spatial analysis and mapping technologies, so the course has been designed to mirror real-world practice.



Learning Rooted in Real Challenges

With only 25 students on the course, the course aims to develop a tight-knit learning community. Students will frequently work in teams on engaging challenges based on real data and reflecting issues based on those encountered by industry, the public sector and non-governmental organisations, and will frequently meet and hear from industry partners.

Students will learn and understand through immersive learning approaches such as hackathons, sprints, gamification and challenge-based team learning. They will also have the option of a year-long work placement or a year abroad between year two and year three, but can progress directly from year two to three if they prefer.

A Future-facing Qualification

Graduates of this programme will have the combined strengths of physical and social environmental sciences to be able to tackle real world problems. This ability to bridge two worlds is a must-have for anyone seeking to have real impact in addressing climate and environmental challenges.

Furthermore, with data literacy built in throughout the course, students will find that their skills are much sought after now and in the future.

Climate and Environmental Sustainability: Areas of Learning

- Climate science
- Geography
- Ecology
- Environmental policy
- Geographical Information Systems (GIS)
- Environmental systems
- Sustainable food security

Building a Vital Skillset

- Teamwork and collaboration
- Personal agility
- Leadership skills
- Communication and presentation skills
- Data literacy and analysis
- Fieldwork, observation and research
- Foreign language

Preparing for a Host of Careers

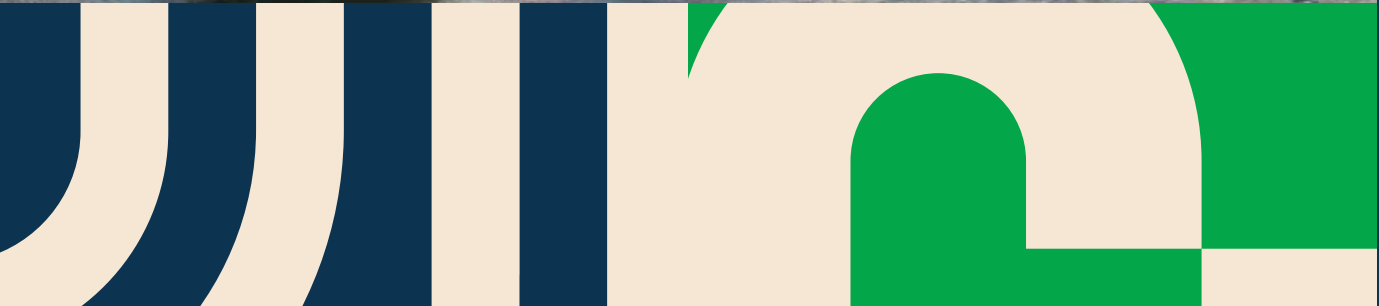
Graduates of this course may end up working with organisations specifically focused on climate change and the environment, but could also work in organisations across the public and private sectors in roles such as:

- Climate Scientist
- Sustainability Manager
- Environmental Consultant
- Environmental Data Analyst
- Corporate Social Responsibility Manager
- Strategic Change Manager
- Conservation Manager
- Environmental Resource Manager
- Environmental Policy Analyst



BSc in Global Challenges

(Entry via DC189)



To address global challenges like climate change, population health and global inequality, the world needs curious, ambitious people who can develop smart, sustainable solutions. This course is ideally suited to learners who want to design creative solutions to real-world problems, and gain the knowledge and skills to make real change happen.

Students study diverse social science and technical topics, including cutting-edge emerging technologies and valuable international relations specialisms. They learn through design challenges, team projects, immersive technologies and role-play simulations to build a toolkit of skills in leadership, project planning and research. These skills enable graduates to work across multiple disciplines, manage diverse projects and become thought and action leaders of tomorrow.

During the course, students frequently encounter our industry partners during projects, workshops and events and also complete a nine-month work placement in third year.

By the time our students graduate, they will be able to develop projects that are technically feasible, and also take into account the bigger picture of social, cultural, economic, political and environmental impact. Graduates may end up working as a project leader, strategic innovator, digital innovation strategist or similar in the public or private sector.

Learning Rooted in Real Challenges

Graduates will understand the global challenges facing humankind today and in the future. The technological solutions to these challenges must meet societal needs and be sensitive to cultural frameworks. To develop solutions for a global challenge, students must be able to question and analyse the many factors that contribute to the challenge. Expertise in the Social Sciences assists with identifying stakeholders' needs that must be addressed in developing feasible

and sustainable solutions. Technical knowledge and skills are required in order to propose, evaluate, and contribute to innovative technological solutions.

Technical Skills

The technical skills addressed in this course reflect the top technologies likely to be adopted by 2025: cloud computing, big data analytics, internet of things and connected devices, encryption and cybersecurity, and artificial intelligence. Robust, practical and highly-sought technical skills and knowledge will empower the graduate to propose solutions that are technically feasible, while taking into account societal, political, and economic factors.

Graduates will be prepared to plan and manage complex projects that involve multiple stakeholders, working across disciplines and crossing traditional boundaries in solving complex real-world problems. To capture and address the needs of these stakeholders, students will need exceptional collaborative and transversal skills. Upon graduating, they will demonstrate the ability to convert ideas from concepts into tangible solutions and adapt these to a changing world.



Global Challenges: Areas of Learning

- Electronic engineering
- Computer science
- Climate change
- Policy and Politics
- Design thinking
- International development
- Data analytics
- Public policy
- Artificial intelligence
- Security and peace studies
- Ethics
- Social science

Skills

- Innovation and creativity
- Critical thinking
- Problem solving
- Leadership and management
- Interdisciplinary teamwork and collaboration
- Personal agility
- Futures literacy

A Breadth of Career Options

Graduates of this course will be prepared to be future leaders who are big picture thinkers, creative problem solvers, socially engaged and passionate about social and technological innovation. They will be equipped with the skills to work across disciplines, crossing traditional boundaries in solving complex real world problems. The ability to understand different perspectives is essential in addressing the full scope of global challenges. Graduates will have the ability to work within and lead teams to plan and manage complex projects involving multiple stakeholders. They will be able to evaluate the impact that potential solutions would have on these stakeholders and the broader impact on the world we live in.

Typical graduate roles include

- Project Leader
- Project Director
- Innovation Strategist
- Business Innovator
- Digital Innovation Strategist
- Sustainability Manager
- Smart Cities Specialist
- Corporate Social Responsibility Manager
- Policy Analyst/Advisor



BSc in Bioprocessing

(Entry via DC180
Biological Sciences
General Entry)



A Truly New Approach

The BSc in Bioprocessing is designed to merge the disciplines of Biological Sciences with Engineering, creating a career-focused and innovative degree. The course aims to educate versatile thinkers who can work at the interface between biology and engineering, research and production.

Bioprocessing graduates will be uniquely positioned to use their skills to thrive in the important biopharmaceutical and food industries. The course is unusual for its type in that the academic team behind it is genuinely multidisciplinary, with a balance of engineers and biologists working together in the same department, rather than in separate faculties.

Rigorous Learning for the Real World

Throughout their course, students will learn by doing. They will engage in hands-on project work and challenge-based learning. That will involve devising solutions to real-world problems in areas such as environmental management that require a knowledge of both engineering and biology to solve.

Collaborating with and learning from both formal industry partners and informal alumni networks, students will gain a keen understanding of how it is to work in this field. In fact, industry experts are involved in creating, teaching and assessing many modules. As is typical for DCU students, they will undertake a nine-month placement in industry in their third year.



Getting to Grips with Data

As ever-growing oceans of data swirl about us, being able to interpret and analyse data is an increasingly critical and sought after skill. Data skills are in high demand in multiple industries and gaining them is core to this course.

In DCU's brand new bioprocessing facility, students will be equipped to start work immediately when they walk into a process plant of any kind, such as a dairy or vaccine facility, for example. They'll know how to measure parameters, extract data, analyse it and improve processes as a result.

Bioprocessing: Areas of Learning

- Basic sciences, mathematics and computing
- Cell biology, genetics and gene cloning
- Process engineering
- Computational problem solving
- Immunology
- Sustainability



A Breadth of Skills

Along with the technical aspects of bioprocessing, students will also build a toolkit of widely applicable skills that will stand to them regardless of where their career takes them. These will include:

- Innovation and creative thinking
- Entrepreneurship
- Data analysis
- Teamwork, collaboration and people management
- Writing and communication skills

A Wide World Awaits

Graduates from the BSc in Bioprocessing will be equipped to work in various roles in multiple industries and for businesses of different sizes, including:

- Start-ups
- Smaller food, drink and drug firms
- Multinational food and pharmaceutical companies
- Global professional services companies



BSc in Chemistry with Artificial Intelligence

(Entry via DC163 Chemical
Sciences General Entry)



It's not often we are given the opportunity to be first in the world at something. Those who choose to study the BSc in Chemistry with Artificial Intelligence at DCU will indeed be part of a global first, as there has never been a degree of its type before. The course sets a new bar for chemists, giving them cutting edge skills and knowledge in a specialism that has been broadly limited to PhD students before now.

This modern chemistry degree will give students an excellent grounding in the fundamentals of chemistry combined with a deep specialism in artificial intelligence (AI). It has been designed to produce graduates who can harness the enormous potential of AI in chemistry, whether that is producing new sustainable materials or new drugs such as cutting-edge vaccines.

Spearheading Innovation

Students will gain an overarching knowledge of how drugs and materials are discovered, developed and produced, and how AI can be used at every stage. Whether they are assessing which type of material to make or how a material will degrade when it is no longer in use, they can use AI to mine data and yield insights, reducing the time and resources needed for practical investigations.

Graduates can expect careers in developing new drugs or drug ingredients, working on environmental applications to help prevent pollution or creating materials that could be sent to space.



Chemistry with Artificial Intelligence: Ways of Learning

Rather than learning by rote, students will learn how to drill into information and problems they encounter, how to gather and process evidence, and how to gain useful insights. Students will have a sense of ownership and feel empowered to tackle difficult challenges as they build their skill sets, while learning all the time from their tutors, lecturers and industry partners.

In addition to lectures and in-person lab work, participants will engage in interactive learning, virtual lab work, and real life challenge-based learning, involving interdisciplinary participants, meaning students will get the chance to collaborate with those on other courses.

Training for the Future

The use of AI is only going to further increase in drugs and materials firms, and the course has been designed to ensure graduate employability into the future. Industry partners will be actively involved throughout the four years, helping to develop the course, deciding skill sets, suggesting software, providing assignments and offering assessments.

More than anything else, however, the factor that guarantees a bright future for graduates of this course will be their versatility. They will be well able to embrace change and will be expected to be future leaders in this area, driving innovation for Ireland and the world.



Chemistry with AI: Areas of Learning

- Foundations in chemical sciences, physics and biology
- Pharmaceutical chemistry, environmental analysis
- Materials science, environmental science
- Mathematics
- Data handling
- Programming
- Machine learning
- Regulation
- Medicinal chemistry
- Hands-on laboratories

Skills for Life and Work

- Teamwork
- Thinking creatively
- Presentation skills
- Problem solving
- Innovation and entrepreneurship
- Extracurricular modules in languages

Rewarding Careers in Chemistry

Given the scale of the chemical pharmaceutical industry in Ireland and globally, chemistry graduates are always highly sought after. Those who choose to study chemistry with AI will find themselves in particularly high demand, given industry needs and a dearth of chemists with specialist AI knowhow.

Graduates may opt to work for large multinational companies in the pharmaceutical or materials sectors, but could also choose to join a start-up that needs an AI specialist to help direct its activities or a small-to-medium-size company that needs desk chemists with an AI specialism.



BSc in Physics with Data Analytics

(Entry via DC175
Physics General Entry)



Ever pondered what working physicists do all day? You mightn't imagine that some physicists spend their time identifying unusual blips in stock market activity, modelling Covid case data, assessing corporate claims about greenhouse gas emissions, or calculating the probability of which teams will win that week's football matches.

Physicists traditionally work in education, research and across a diverse range of industries. You may not have considered that they are highly sought after by banks, insurers and global tech firms. This is because they can solve problems and test theories using real-life data. This ability to apply mathematics and modelling to describe and solve problems in different scenarios is a vital skill in the modern workplace.

Specialist Data Skills

The new BSc in Physics with Data Analytics opens a valuable new route to a range of careers across the manufacturing, scientific research, financial services, and software sectors. Our graduates combine the skills and knowledge of a physics degree with the advanced data analytics tools needed to solve real-world problems. It will not only equip graduates with the strong maths skills they'll need to make robust, accurate predictions, but will also ensure that they understand the reliability of these predictions.

Students will also learn specific programming languages and machine learning and artificial intelligence methods. These tools are essential to deal with the large data sets now common not just in physics, but also at the cutting edge of the finance and technology sectors.

Fresh Ways of Learning

While a physics degree demands traditional lecture hall and laboratory work, this degree course involves multiple modes of learning, with lecture and labs supplemented by self-guided work and interactive online material. It will also include challenge-based learning, immersive exercises and interdisciplinary collaboration so that students will, for example, collaborate with business or psychology students.

The BSc in Physics with Data Analytics is run by the DCU School of Physical Sciences in collaboration with partners across DCU and industry, and is provisionally accredited by the Institute of Physics.

A Valuable Pathway

This course is one of four potential degree courses open to students who complete the first year of DC175 "Physics General Entry" at DCU. It opens up valuable opportunities for students right across the contemporary world of work, and will equip them for both technical and managerial roles. Most importantly, it will prepare them for roles which require them to bridge technical and business aspects. In fact, physicists often end up in middle or higher management positions.



Physics with Data Analytics: Areas of Learning

- Institute of Physics accredited 'Core' Physics:
 - Mechanics & Waves
 - Light & Optics
 - Electricity & Magnetism
 - Material Science
 - Relativity
 - Quantum Mechanics
- Data Analytics
 - Programming
 - Databases
 - Data Visualization
 - Machine learning & Artificial Intelligence
 - Data Ethics
- Programming
- Mathematics and Statistics
- Quantum Technologies

Skills for Life and Work

Our graduates also develop valuable skills which are transferrable to the wider world of work:

- Teamwork
- Collaborative Coding
- Communications and Presentations
- Critical Thinking
- Data Visualisation
- Problem-Solving
- Extracurricular Language Modules

Rewarding Careers in Physics

Graduates from the BSc in Physics with Data Analytics are much sought after as researchers, analysts, and project managers by technology startups, universities, semiconductor firms, banks, insurers, gaming companies, software firms, global tech firms and multinational professional services organisations. A future in middle or higher management will be a concrete option for those interested in it.



Bachelor of Business Studies with Business Analytics



**New specialism in Bachelor of Business Studies
(Entry via DC111)**



When it comes to business buzzwords, Big Data is among the most common these days. It's all about the ability of businesses to turn torrents of data into valuable insights in order to turbo-boost their performance. They can't do that, however, without specialists who understand their business strategy and priorities, and can also analyse and interpret huge data sets.

That's why DCU has introduced a new specialism in Business Analytics on its undergraduate Business Studies course. Graduates who choose this pathway will be prepared to thrive in today's data-driven economy, enabling their future employers to harness the power of big data.

Opting for Analytics

Final year Business Studies students at DCU are fortunate to be able to choose to focus on one of a range of specialisms, including business economics, finance, management, marketing, HR or this new business analytics specialism.

On this pathway, students will undertake a dedicated set of modules around analytics, drawing on their earlier study on statistics. They will discover how to analyse data with statistical techniques and advanced software in order to fuel strategic and real-time decision-making.

Relevant to the Real World

DCU Business School is renowned for its close links with business and industry. The course content for this specialism is being designed in close collaboration with our industry partners and they will continue to be heavily involved in the design, delivery and assessment of our Business Analytics specialism. Students will have multiple opportunities to engage with and be mentored by working business people.

Furthermore, business analytics students will also learn in situations similar to real-life scenarios. These could include challenge-based projects, intensive bootcamps and code academies.

Future Ready Students' Careers

Not only will a specialism in analytics almost guarantee graduates employment now, but this will continue to be the case in coming years as businesses across multiple sectors find themselves grappling with oceans of data.

These organisations need employees with diverse analytical, technical, social and strategic mind-sets and skills, as well as the hands-on experience Business Studies with Business Analytics students can gain during their INTRA (work experience) placement and while working on interdisciplinary projects at DCU.





Business Studies with Business Analytics: Areas of Learning

- Statistics
- Data analytics
- Applied business analytics
- Artificial intelligence and machine learning
- Software and dashboards (R, Tableau, SPSS)
- Programming (Python and Java)
- Evidence-based logic
- Data visualisation

Skills for the Workplace

- Strategic thinking
- Communications
- Presentation skills
- Collaboration and teamwork

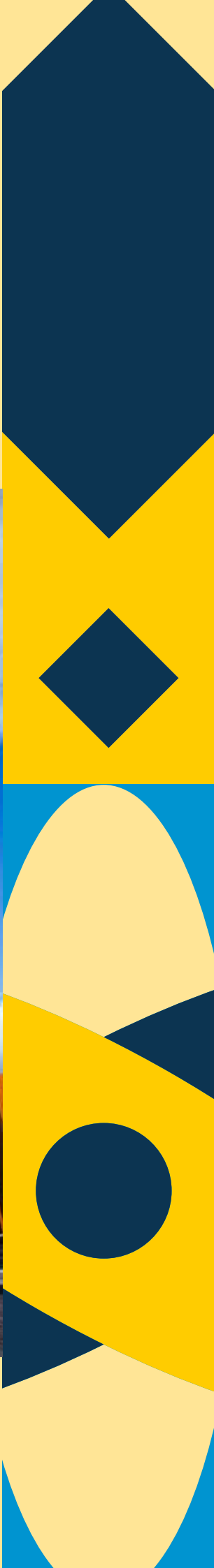
Rewarding Careers in Analytics

Business graduates who have specialised in business analytics will find they are especially sought after in the management consulting sector, as it has a huge need for qualified business analysts.

Graduates will be also in high demand in any sector where digital transformation is driving change. Demand forecasting, new supplier identification, production planning, contract management, marketing, in-store traffic management, customer experience, workforce optimisation, logistics, financial risk management, environmental risk management are among the areas in which the need for interdisciplinary creative thinking and data driven strategic and tactical decision making will become necessary elements for a firm's survival. They could find themselves working as business intelligence analysts, business analytics project managers, and more besides.









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