

CTU  
IRELAND



2021

# CAT & Summer Scholars

2 Week Online Academic Programmes

For 12-17 year olds with high academic ability

Session 1: 5th - 16th July

Session 2: 19th - 30th July





# Invitation to CAT 2021

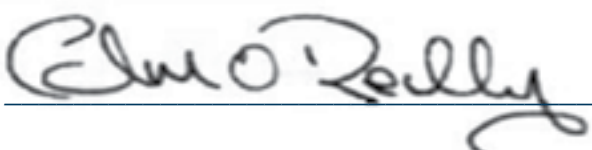
*We look forward to welcoming you to CTYI this summer for the 2021 CAT Summer programme. Unfortunately circumstances have again dictated that the courses must be online again this year. This was a difficult decision to make but we will always put the safety of students and staff first and follow the public health guidelines in that regard . With the numbers involved with CAT and CTYI it was just not feasible to run a full programme on campus this year. As we are running online this year we have decided to combine the CAT and Summer Scholars programme for 2021 only.*

*We have now had a year of learning in relation to running online programmes and after hearing your feedback from last summer and reviewing our existing practices we have come up with a set of programmes that we hope will allow you to learn some exciting new skills and try out some college-like subjects.*

*We will retain the high academic standards that have seen over 20,000 people participate in previous programmes. If this is your first CTYI experience then we will try to give you a new academic challenge and hopefully you will get to make some new virtual friends this summer that will become face to face friends for life in years to come.*

*We will have the same subject experts offering you an introduction to some exciting college courses where you will get to participate in some new learning and research projects and you will hopefully work closely with your classmates in this regard. Outside of class we hope to run a few activities to help you to get to know everyone who is on the course.*

*We will always look to our students for guidance and we would like to work with you to make this a memorable experience for everyone. We look forward to seeing you (on screen) this year at CTYI!*



**Dr. Colm O'Reilly**  
CTYI Director

# Application Information

## Course Fee: €450

€450 refers to one 3 hour course ie Morning or Afternoon, not both.

Students may choose to attend both a Morning and Afternoon course within the same session, the total cost would in that case be €900.

You will be directed to the CTYI Online payment portal within the application form.  
Detailed directions are listed under the section "Application Payment".

An online payment does not constitute an application on its own, and does not guarantee a place on any programme. You **MUST** complete the application form.

Students wishing to apply for Financial Aid should contact [ruth.lally@dcu.ie](mailto:ruth.lally@dcu.ie) before submitting their application.

## Application Deadline: 14th May 2021

### To access Application Form either:

**Scan QR Code**

**OR**

**Go to our website**



**[www.dcu.ie/ctyi](http://www.dcu.ie/ctyi)**

where there will be an interactive digital version of this brochure available in which you can click on the link below.

alternatively, copy this link into your browser to access the form:

**<https://forms.gle/rCfACoPQsaXdA73W9>**

if you have difficulty accessing the application form please contact

**[ruth.lally@dcu.ie](mailto:ruth.lally@dcu.ie) or [orla.dunne@dcu.ie](mailto:orla.dunne@dcu.ie)**

#### HOW TO SCAN: OPEN, AIM + TAP



Open the camera on your phone



Aim it at the Flowcode



Tap the banner that appears

# Course Information

Designed to be intellectually stimulating, courses are fast paced and cover material in more depth and at greater levels of complexity than is usual at post primary school. Over 20 courses are on offer, many of which deal with topics not normally encountered in post primary school.

## Eligibility

The Centre for Academic Talent and Summer Scholars Programme for 2021 is open to all secondary students aged 12-17 (except those sitting their Leaving Cert in 2021) to all students who have participated in the CTYI Talent Search or who have demonstrated excellent ability and are interested in these courses.

## Course Structure

Students may take a two week course on either Session 1 or Session 2, or both.

Students may choose to attend both a morning and an afternoon course in the same session.

These courses are for 30 hours tuition for two weeks, made up of 15 hours per week.

Class sizes are small with up to 18 students per class. Classes have an instructor and a teaching assistant. CTYI staff are chosen on the basis of mastery of the subject, enthusiasm and good communication skills. Homework will be assigned and this will take about an hour per day to complete.

## Course Choices

Applications must be made online using the CAT application google form.

To access this form, either scan the QR Code opposite or go to <https://forms.gle/rCfACoPQsaXdA73W9>

Students should think very carefully about their course choices, listing only those courses which they will accept if they do not receive their first choice. The more flexible students can be, the greater their chances of being assigned to a course. Students are assigned to courses on a first-come, first-served basis.

Please Note - even if you have applied previously for the 2020 Summer Programme, you MUST apply using the online application form as applications will not be transferred, you will not be offered a place if you do not apply.

## Course Allocation

Courses will be assigned on a first-come, first-served basis for each course. Applications will be closed for each course when they have reached capacity. Submission of an application does not guarantee a place on a course. Students who have applied before the capacity for their course of choice has been reached, will be contacted with course offers before the 18th of June.

## Note to Returning Students

Please do not assume that because you have participated in CAT previously, you will receive a place on your chosen course. It is very important for you to apply promptly, as courses will be assigned as always, on a first-come, first-served basis.

# Daily Schedule

Morning Classes		Afternoon Classes	Activities!
<i>10 am -1pm</i>	<i>Lunch</i>	<i>2pm - 5pm</i>	<i>7pm - 8.30pm</i>

## Classes

Students are in class for 3 hours each day.

(If students apply to attend both morning and afternoon courses, the total class time would be 6 hours each day.)

Morning courses take place between 10.00am and 1.00pm

Afternoon courses between 2.00pm and 5.00pm

Each class will contain a short break, at approximately 11:15 to 11:30 for the morning sessions and 3:15 to 3:30 for the afternoon sessions.

Live classes will be conducted over Zoom and students will get to do breakout room group work in Zoom and Google Classroom. Instructors and Teaching Assistants will be available for the full three hours of teaching time every day. Homework will be assigned and this will take about an hour per day to complete.

## Activities

Between 7.00pm and 8.30pm students will have the opportunity to take part in recreational and social online activities organised and run by members of our residential team.

These activities will run on Mondays, Wednesdays and Fridays and may include quizzes, remote yoga classes, CTYI Ted talks, book clubs and "appreciations". Last year we even held a disco over Zoom!

Students will receive an email each week with activity information and a form to sign up. These activities will be optional to attend, at no extra cost. We hope that these activities will offer a slice of life of CTYI, in lieu of the usual social activities held as part of the programme!

# Summer Courses 2021

## Session 1: 5<sup>th</sup> -16<sup>th</sup> July

Mornings  
10am - 1pm

***Criminology***  
***Engineering***  
***Forensic Science***  
***Medical Science***  
***Social Psychology***  
***Sports Science***

Afternoons  
2pm - 5pm

***Athletic Therapy***  
***Behavioural Psychology***  
***Cognitive Psychology***  
***Electronic Engineering***  
***Emergency Medicine***  
***Microbiology***

**To Apply**  
**Scan QR Code**



or go to:  
<https://forms.gle/rCfACoPQsaXdA73W9>

## Session 2: 19<sup>th</sup> - 30<sup>th</sup> July

Mornings  
10am - 1pm

***Child Psychology***  
***Criminology***  
***Fiction Writing***  
***Game Theory***  
***Medical Science***  
***Pharmacology***

Afternoons  
2pm - 5pm

***Biotechnology***  
***Cognitive Psychology***  
***Law***  
***Neuroscience***  
***Problem Solving***  
***Screenwriting***

# Course Descriptions

## ***Athletic Therapy***

Physical activity is a necessary part of daily life, but this same activity can also lead to injury in any person, regardless of their fitness. Some sports injuries result from accidents; others are due to poor training practices, improper equipment, lack of conditioning, or insufficient warm-up and stretching. An Athletic Therapist focuses specifically on musculoskeletal injuries and their prevention, assessment, treatment and rehabilitation. This course will take you through anatomy and give you a better understanding of what injury is. You will learn about how physical conditioning can help us to prevent injuries during training and the best way to achieve that.

## ***Behavioural Psychology***

This domain of psychology is based upon the concept that behaviours can be explained through observation, and that individuals behave according to their environment. It contends that our actions are a response to stimuli. This course will bring into sharp focus the environmental component of the nature vs nurture discussion. Assuming that each of us is born with a blank canvas, it will seek to better understand the impact of different life experiences and environmental factors. Students can expect to learn about the work of Skinner, Pavlov, Thorndike, Erikson, and Bandura. With a myriad of fascinating topics, including, fight or flight syndrome, overcoming fears, conformity, aversion and altruism, students on this course will sit back, observe and develop their own conclusions as to why human behaviour is as it is.

## ***Biotechnology***

Biotechnology is the fascinating study of how living organisms can be manipulated to improve many areas of society. This course will investigate how animals and plants are cloned and why and how the fields of pharmaceuticals, medicine, food and agricultural have all advanced using this form of biological engineering. Famous case studies, such as Dolly the sheep, and the controversy behind Monsanto's genetically modified fertilizers, will be discussed. The ethical dilemmas of using biotechnology, especially in the case of human and animal cloning, and also in genetically 'designing' babies to have particular traits, will be debated.

## ***Child Psychology***

Have you ever wondered what makes us the way we are - is it something we're born with, or something we learn? The Child Psychology course will provide students with an understanding of child development, highlighting the nature of physical, cognitive, social and emotional development during the childhood years. The class will explore and evaluate the various theoretical approaches to child development, and will present to the student, in a comprehensive and meaningful way, key influential studies alongside developments that have emerged in the field, and will consider the practical applications of theoretical knowledge about child development.



## ***Cognitive Psychology***

Do you go with your gut feeling or do you second guess things? What happens when we read a conspiracy theory? Does taking a walk in the park really help reduce stress levels? Cognitive Psychology studies how information is encoded, stored, manipulated, and transmitted in order to explain the functioning of the human brain. It includes learning and memory, thinking and consciousness, perception, and attention. It is a wide-reaching field that answers fascinating questions. Like how the brain has changed how it interprets facial information now that mask-wearing is commonplace. Or how tears are like a magnet for our visual attention. Cognitive psychology has proved useful for treating memory loss and selective attention disorders. Cognitive psychologists may work in different areas, for example, child development. They can support educators in helping to plan suitable content for each age group, and to decide the best tools for delivering it. In the legal system, cognitive psychologists can be called on to assess eyewitness testimonies in order to establish whether a witness has accurately recalled a crime. If you wonder about how the brain functions, or about how our brain interprets information, then this is the course for you.

## ***Criminology***

What is crime? Who commits crime? Why do people commit crime? How is crime dealt with? Criminology is the scientific study of the nature, extent, causes, and control of criminal behaviour in both the individual and in society. This course will delve into many areas in an attempt to explain crime and criminal behaviour. The course will start by assessing the different theoretical perspectives which attempt to offer a scientific study of 'crime' and the 'criminal', from classical to contemporary theories. We then take a more practical approach, reviewing topical criminal justice issues in Ireland and elsewhere such as crime rates, media and crime, policing, poverty and sentencing policies. We conclude with an overview of studies in penology and penalty, theories of the prison and of alternatives to imprisonment.

## ***Electronic Engineering***

Electronic engineering is an exciting subject choice for any student with an inquiring mind and a love of problem solving. The field includes semiconductor circuit design, power, telecommunications and instrumentation engineering. Since the early radio communications work of Guglielmo Marconi and Nikola Tesla, electronic engineering has continued apace and brought about radar and radio location, television, computers, microprocessors, transistors: the list goes on. In more recent years, it has intersected with the field of Biology and healthcare with the development of improved diagnostic imaging, hearing devices, blood vessel implants, laser surgery, etc. Electronic engineering is also responsible for robotics, Virtual Reality and Augmented Reality, wearable devices, electric vehicles and artificial intelligence. It's a field that's at the cutting edge of much of the technology we see around us. If you enjoy mathematical problems, are enthusiastic about technology, and generally like to ponder how engineering can be used for the betterment of our lives, then you will thoroughly enjoy this course.

## ***Emergency Medicine***

Emergency medicine is a field of medicine which provides care to patients who have experienced a sudden accident, traumatic injury or worsening of an existing medical problem. Medical emergencies can happen to anyone, at any time and at any age, which is why knowing how to help people calmly and effectively are skills that are not solely reserved for medical professionals. Identifying basic steps in managing acutely unwell patients in the pre-hospital setting can greatly improve patient outcomes and is the first step in returning that patient to good health. Skills which are necessary include; Injury recognition (bleeding, breaks and burns), bleeding management and bandaging injuries, recognising and treating heart attacks/strokes/epilepsy. Emergency medicine is much more comprehensive than the above skills, however by mastering these simple techniques, even the lay person can provide emergency care until paramedics arrive and can improve patient outcomes

## ***Engineering***

In reality, without engineers, the world would fall down around our ears. Yet, most of their work goes largely unnoticed. If we examine the world around us, practically everything man-made that we can see, an engineer has been involved in it. This course introduces the basics of the various fields of engineering. The class will work on developing the problem solving and communication skills that are essential for a career in Engineering. We are faced with basic needs in everyday life. It is these needs and providing for them that fuels the problems for which engineers must provide solutions in the most efficient, socially aware, aesthetic and cost effective manner. Civil Engineering: buildings and roads, Mechanical Engineering: machinery and manufacturing, Electronic Engineering: circuits and robotics, Computer Engineering: programming and hardware. As the Engineering umbrella covers so many areas, this should prove to be a demanding, interesting, challenging and extremely enjoyable course.

## ***Fiction Writing***

This course is designed for young creatives to learn and hone the craft of fiction writing. We will explore the writing process from idea stage to final print and performance. A variety of forms will be examined including short stories and flash fiction, novels and novellas, scripts and screenplays, as well as some of the more elusive categories such as ballads, verse novels, comics and graphic novels. We will study the building blocks of fiction including character and dialogue, plot and conflict, setting and description, voice and point of view, while also considering points of style, structure, genre and audience. Additionally, we will examine works of established writers to learn the tricks of the trade, as well as the clichés to avoid. With all of these key tools under our belts, we will aspire to create fiction which is compelling, convincing and authentic. This will be a highly practical and interactive course with plenty of writing exercises and workshops, and students will be asked to submit written extracts, share their work aloud, and offer constructive feedback to peers. Whether you're a complete novice or an accomplished writer, have the glimmer of an idea or been working on a long-term project, this course will help you get over your writer's block, improve your skills, commit to your writing, learn what works for you (as well as what doesn't!), and most importantly, discover just who you are as a writer.

## ***Forensic Science***

Forensic science is the application of scientific processes to help solve crimes. Forensic science incorporates aspects of chemistry, physics, and biology, to draw impartial conclusions from evidence to support the prosecution or defense in investigations. Forensic evidence includes DNA profiling, fingerprints, toxicology, ballistics, and much more. Forensic scientists must analyse whatever is found at a crime scene to draw conclusions about what happened and who may have committed the crime. This course will introduce you to some of the science and techniques used by forensic scientists to catch criminals.

## ***Game Theory***

Game theory is the study of strategic interactions. This course is about asking what happens when people or things with different incentives or motivations interact against one another to achieve their own best outcome. It has become the underpinning of evolutionary theory, economics, business processes, international relations, and is the subject of major motion pictures, like 'A Beautiful Mind'. In this course we will discover the laws underpinning every game and study specific examples of different types of games taken using examples from literature, the movies, board games, economics, molecular biology, international politics, business studies, dating, game shows, government funding opportunities and, of all things, fuel injection mechanisms in cars and the songs of the Dunes in the Sahel. Students will learn to develop their own games and study the development of others. No mathematical knowledge is needed to take the course as all concepts will be developed as we go in a fun and intuitive way, focusing on the ideas and their implications rather than the technical aspects of the theory. Students who care about understanding their world should enjoy this course.

## **Law**

How many of us know how the law actually works? It's around us every day, but for many it remains a mystery. Crime scene shows and courtroom dramas give a glimpse of its inner workings, but even they often don't tell you the full story. This course has that full story. First, it's about how law is applied in practice today. At the end of three weeks, you will be able to debunk many of the common myths surrounding the law. Is an accused person always innocent until proven guilty? Is DNA evidence as conclusive as it seems? How do judges and juries really come to their conclusions? With this new understanding of how law is in reality, the class will embark on a course long project to design reforms of the law. Next is how law is written down, in legislation, the Constitution, and in books. We will look at all the main areas that students might encounter (like criminal law, tort, and constitutional law) as well as some of the lesser known areas of study, like media law and sports law. Throughout the course there will be a particular focus on the Constitution and the effect the European Convention on Human Rights has on Irish law. The last part of the story shows you how to 'do' law. We will develop some of the most crucial skills that any good lawyer needs: opinion writing, case analysis and, of course, your skills of persuasion, which will be honed in the class discussions that form an integral part of the course.

## **Medical Science**

Do you want to be a doctor in the future? If so, why not try this innovative taster course in medicine, which contains both theoretical and practical elements. Students will learn about health and illness with a focus on anatomy, the causes, prevention and possible cures and treatments of various diseases. The course will focus on problem based learning where these health practitioners of the future will be taught the basics of medicine using case studies, evidence from expert speakers and advice from the instructor. Debates and discussions on topics such as the value of alternative therapies, should blood and organ donation be compulsory, and is biotechnology the way forward for medical treatments, will be carried out by the students.

## **Microbiology**

Microbiology; the study of all living organisms or microbes invisible to the naked eye. This miniature world of bacteria, viruses, fungi, protozoa, amongst others plays a key role in climate change, bio-degradation, disease and biotechnology. Microbes too have a critical role in today's world in the creation of bio-fuels, pharmaceuticals, pollution solutions and food and drink production. On this course students will cover the areas of virology, bacteriology, protistology, mycology, immunology and parasitology. It will look at major breakthroughs in the field, going back to some of the early ones such as Jenner's vaccine for Smallpox and Fleming's discovery of penicillin. If you have a passion for science and scientific discovery, then this course is not to be missed.

## **Neuroscience**

Why do we sleep? How do some people 'smell' colour? How do our brains change throughout life? Why did the man mistake his wife for a hat? Is nature or nurture more important in how we behave? Are you interested in these questions? Then the Neuroscience course is for you! Neuroscientists now work in fields as varied as mechanisms of disease, drug development, sports medicine and psychology and we shall touch on all of these areas. Students will begin with the basics of cellular biology and neuroanatomy before taking a tour of the brain looking at both the normal function of different areas of the brain and what happens when these functions break down. We shall also look at more recently developed fields of neuroscience such as stem cell therapies and brain-computer interfaces. This course is of interest to anyone who has an interest into how our brains work, how we process the world around us and what happens when these systems break down. We shall also look at and discuss how this fascinating research that is carried out in laboratories in Ireland and around the world. The class will be lecture based but enthusiastic discussions are welcome!

## **Pharmacology**

We classify a drug as any substance which is given to a human or animal with the objective of changing something about the body function, such as relieving pain, treating cancer, eliminating infection or improving health. Pharmacology is the scientific study of drugs and how they impact biological systems, from the smallest genes and cells up to tissues and even human populations. Chemists are constantly designing and testing new drugs with the hopes of dealing with illnesses and conditions that were previously untreatable, or improving upon treatments that currently exist. In this course, you will learn about how different drugs work on the body, and how we go about trying to create new, life-saving medicines

## **Problem Solving**

*"Mathematics is not about numbers, equations, computations or algorithms; it is about understanding"* - William Paul Thurston

Using a wide variety of mathematical questions, students will develop their analytical skills and learn how to take a lateral approach to problem solving. Both individual and in teams, this course will challenge students to look at mathematical problems from different viewpoints. It will teach students to be flexible, innovative and resilient in how they approach finding a solution. Students will look at some of the great unsolved mathematical problems, like the Millenium Prize Problems, amongst others. And while this is a very applied and practical course, students will also follow some of the great mathematicians and their incredible works. Mathematical Sciences will suit students who think logically, enjoy problem solving, are mentally flexible and comfortable thinking in abstract terms. A healthy enjoyment of mathematics helps too!

## **Screenwriting**

For the great Robert Altman, screenwriting is like blueprinting, and for Diablo Cody, it's akin to sketching. Every film, tv show or documentary begins with a script that distils a story to its very essence, but more importantly leaves room for interpretation. A good screenwriter provides the cues that allow directors, cinematographers, and actors to breathe life into a story in their own ways. In this writing course, we will explore the cornerstones of screenwriting from killer dialogue to key action, always keeping the camera in mind. We will experiment not only with original screenplays but also explore the ever-popular art of the adapted screenplay. We will learn from the best, considering the work of film giants such as Alfred Hitchcock, Aaron Sorkin, Steven Spielberg, and Greta Gerwig, as well as TV favourites such as Donald Glover, Shonda Rhimes, and Lisa McGee. Whether you're an aspiring screenwriter, or want to try your hand at a new area of writing, this course will help you perfect your screenwriting skills and produce scripts that are just begging to be brought to life!

## **Social Psychology**

If psychology is the study of human behaviour, social psychology looks at that behaviour in action in the world. This course seeks to impart a detailed understanding of the burgeoning field of social psychology, focusing specifically on the applied use of psychology in the fields of politics, advertising and healthcare. Students will be introduced to psychological theory of attitudes, attractiveness, prejudice, groups and teams, attribution, self-identity and helping behaviour. How do our attitudes affect our behaviour? Can we ever truly overcome prejudice? What is the best way to address racial tension in schools? How do juries behave, what influences them, and why? This wide ranging course will use case studies from Irish advertising campaigns, the healthcare system, recent Dáil elections and the American presidential campaign to deepen students' understanding of the structure and function of human behaviour and its effects in the world. Students will conduct and present research to the class on topics of current interest, and will have the opportunity to design and present the results of a psychological experiment of their choice.

## **Sports Science**

Sport and exercise scientists use research and analysis to give specialist advice to improve individual or team athletic performance. They also design and administer appropriate methods of assessment, and create exercise or training programmes aimed at improving either health or sporting performance. As a sport scientist, you must be well versed in technical, physiological and psychological aspects of your field in order to cover territory as diverse as exercise testing, psychological preparation for competition, movement analysis, dietary considerations and strength training. In the Sports science course you'll learn more about key science subjects that form the backbone of this degree: chemistry, physics, anatomy, physiology, psychology and sociology. As you progress, you'll learn how these subjects are applied to the study of sport, exercise and health.

# Contact Us

### **Ruth Lally**

*Student Applications*

*ruth.lally@dcu.ie*

### **Orla Dunne**

*Student Applications & Social Activities Coordinator*

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### **Dr. Colm O'Reilly**

*Director*

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# Discipline

Students may be **immediately dismissed** from the course for any of the following reasons:\*\*

- Violating or putting at risk the safety and well-being of any person
- Threatening or intimidating behaviour toward staff or students
- Taking a picture, video or audio recording of a staff member or student without their express permission, including screenshots and screen recordings

Students may be **subject to dismissal** from the course for any of the following reasons (on a case by case basis):\*\*

- Punctuality (applicable to all aspects of the course)
- Bullying, in person or via social media
- Not attending satisfactorily to their academic work, including repeated absence from class
- Abusive language in verbal or written form to students or staff members
- Inappropriate behaviour online

**\*\*Or for any other reasons which in the opinion of the director are of a sufficiently serious nature to warrant dismissal from the programme.**

## In Addition

- Students may not contact a staff member on any social network.
- Students may not share Zoom class codes or activity codes with any person not registered for the course.
- Students may not record any part of the programme on their device or a mobile device even for personal use without express permission of staff.

*Students will be sent further guidelines related to their conduct in class before the beginning of the programme.*

## Important to Note

Students who violate programme rules are subject to the disciplinary actions outlined above. No refunds will be made to students dismissed from the programme. Details on CTYI Data Protection and Equality policies can be found on our website

[www.dcu.ie/ctyi/CTYI-Policies](http://www.dcu.ie/ctyi/CTYI-Policies)

# Terms & Conditions

PLEASE NOTE

***An online payment does not constitute an application on its own, and does not guarantee a place on any programme.***

You MUST complete the online application form (<https://forms.gle/rCfACoPQsaXdA73W9>)

## **Registration Fee**

All fees (€450/€900 total) include a €100 registration fee, which is non-refundable for courses accepted.

## **Course Allocations**

All communication relating to course allocations is communicated by post.

Please do not call the office as we cannot share this information by any other means.

Places are allocated on a first come, first served basis.

Incomplete application forms will not be processed.

CTYI reserves the right to cancel or alter any course, if due to unforeseen circumstances the course cannot be run economically or efficiently.

## **Refunds**

Refunds are only provided where a course does not take place or where a course is full.

Refunds are not given if the student withdraws from the programme having been offered a place on one of their course choices.

The €100 Registration fee is non-refundable for courses accepted.

Fees are non-transferable.

No refunds will be made to students dismissed from the programme.



# Application Deadline 14<sup>th</sup> May 2021

Centre for Talented Youth Ireland  
Dublin City University, Dublin 9

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