THE DUBLIN ACADEMY OF EDUCATION

APPLIED MATHS

LEAVING CERT (HIGHER LEVEL)

'A GUIDE TO APPLIED MATHS'

KIERAN MILLS

STILLORGAN WEEKLY GRINDS TIMETABLE

South Dublin weekly grinds take place in Stillorgan Plaza, Lower Kilmacud Road, Stillorgan,Dublin.

6th Year

SUBJECT	LEVEL	DATES	TIME
Accounting	H	Wednesdays	5:00pm - 6:15pm
Accounting	H	Saturdays	10:30am - 11:45am
Applied Maths	H	Mondays	5:00pm - 6:15pm
Applied Maths	H	Fridays	4:45pm - 6:00pm
Biology	H	Mondays	8:00pm - 9:15pm
Biology	H	Tuesdays	5:30pm - 6:45pm
Biology	H	Saturdays	9:00am - 10:15am
Business	H	Wednesdays	5:00pm - 6:15pm
Business	H	Saturdays	12:30pm - 1:45pm
Chemistry	H	Mondays	6:15pm - 7:30pm
Chemistry	H	Wednesdays	6:30pm - 7:45pm
Chemistry	H	Saturdays	9:00am - 10:15am
Economics	H	Mondays	6:30pm - 7:45pm
Economics	H	Saturdays	9:00am - 10:15am
English	H	Tuesdays	7:00pm - 8:15pm
English	H	Wednesdays	5:00pm - 6:15pm
English	H	Wednesdays	6:30pm - 7:45pm
English	H	Saturdays	10:30am - 11:45am
English	H	Saturdays	12:15pm - 1:30pm
French	H	Mondays	6:15pm - 7:30pm
French	H	Wednesdays	6:45pm - 8:00pm
French	H	Saturdays	9:00am - 10:15am
Geography	H	Tuesdays	5:30pm - 6:45pm
Geography	H	Thursdays	5:45pm - 6:45pm
German	H	Mondays	8:00pm - 9:15pm
History	H	Thursdays	5:45pm - 7:00pm
Home Economics	H	Tuesdays	5:30pm - 6:45pm
Irish	H	Mondays	8:15pm - 9:30pm
Irish	H	Wednesdays	6:45pm - 8:00pm
Irish	H	Saturdays	10:45am - 12:00pm
Maths	H	Mondays	8:00pm - 9:15pm
Maths	H	Tuesdays	7:00pm - 8:15pm
Maths	H	Wednesdays	5:00pm - 6:15pm
Maths	H	Wednesdays	8:15pm - 9:30pm
Maths	H	Saturdays	10:30am - 11:45am
Maths	H	Saturdays	12:15pm - 1:30pm
Maths (Fast Paced)	H	Fridays	6:15pm - 7:30pm
Maths	O	Tuesdays	7:00pm - 8:15pm
Maths	O	Saturdays	12:15pm - 1:30pm
Physics	H	Mondays	6:30pm - 7:45pm
Physics	H	Thursdays	7:15pm - 8:30pm
Spanish	H	Tuesdays	7:00pm - 8:15pm
Spanish	H	Saturdays	10:30am - 11:45am

5th Year

SUBJECT	LEVEL	DATES	TIME
Accounting	H	Saturdays	9:00am - 10:15am
Applied Maths	H	Thursdays	5:45am - 7:00pm
Biology	H	Thursdays	5:30pm - 6:45pm
Business	H	Mondays	5:00pm - 6:15pm
Chemistry	H	Wednesdays	5:00pm - 6:15pm
Chemistry	H	Saturdays	10:45am - 12:00pm
Economics	H	Thursdays	7:15pm - 8:30pm
English	H	Wednesdays	8:15pm - 9:30pm
English	H	Saturdays	9:00am - 10:15am
French	H	Wednesdays	5:00pm - 6:15pm
Geography	H	Tuesdays	5:30pm - 6:45pm
Geography	H	Thursdays	5:45pm - 7:00pm
German	H	Mondays	8:00pm - 9:15pm
Irish	H	Mondays	8:00pm - 9:15pm
Maths	H	Tuesdays	7:00pm - 8:15pm
Maths	H	Wednesdays	6:30pm - 7:45pm
Maths	H	Saturdays	10:30am - 11:45am
Maths	(O)	Tuesdays	7:00pm - 8:15pm
Maths	(O)	Saturdays	12:15pm - 1:30pm
Physics	H	Tuesdays	7:00pm - 8:15pm
Spanish	H	Tuesdays	5:30pm - 6:45pm

4th Year

SUBJECT	LEVEL	DATES	TIME
Biology	H	Thursdays	5:30pm - 6:45pm
English	H	Tuesdays	5:45pm - 6:45pm
Irish	H	Mondays	5:15pm - 6:15pm
Maths	H	Mondays	6:30pm - 7:30pm
Maths	H	Tuesdays	7:00pm - 8:00pm
Physics	H	Thursdays	5:30pm - 6:45pm

3rd Year

SUBJECT	LEVEL	DATES	TIME
English	H	Wednesdays	6:30pm - 7:30pm
English	H	Saturdays	10:30am - 11:30am
Irish	H	Mondays	6:30pm - 7:30pm
Maths	H	Tuesdays	5:45pm - 6:45pm
Maths	H	Thursdays	5:30pm - 6:30pm
Maths	H	Saturdays	9:15am - 10:15am
Science	H	Saturdays	12:15pm - 1:15pm

1st & 2nd Year

SUBJECT	LEVEL	DATES	TIME
English	H	Wednesdays	5:15pm - 6:15pm
Irish	H	Thursdays	5:30pm - 6:30pm
Maths	H	Mondays	5:15pm - 6:15pm
Maths	H	Thursdays	6:45pm - 7:45pm

LIMITED TIME SPECIAL OFFER

BOOK 1 SUBJECT, GET ADDITIONAL SUBJECTS HALF PRICE

TO BOOK CALL US ON
01 442 4442

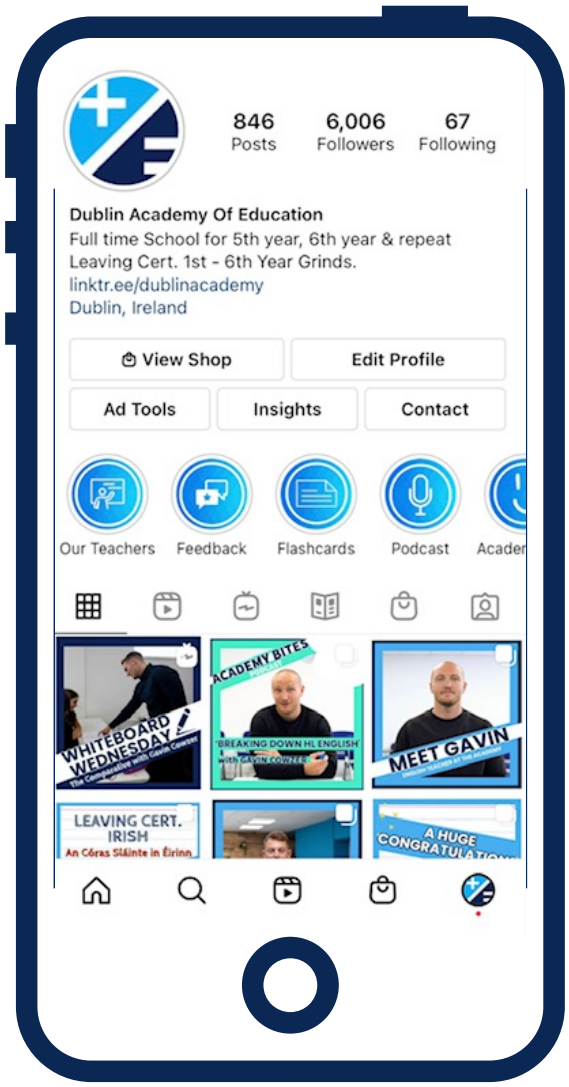
OR BOOK ONLINE AT
WWW.DUBLINACADEMY.IE

FOR OUR KILLESTER, LIVE-STREAMED AND ON-DEMAND GRINDS OPTIONS, PLEASE SEE OUR WEBSITE

THE DUBLIN ACADEMY OF EDUCATION

Follow us on Instagram for:

- Tutorials
- Podcasts
- Free Notes
- Top Tips



scan me

@dublinacademy

CONTENTS

Exam Layout

- The duration of the exam is 2 hours and 30 minutes.
- There are 10 questions on the paper.
- You must complete any 6 questions out of 10.
- Each question carries 50 marks giving a total of 300 marks for the exam.
- Most questions are made up of two parts broken up into 20 marks and 30 marks or 25 marks each. Sometimes there is one big question for 50 marks.
- The most popular questions are 1 to 5 and question 10.
- **Timing**: You should spend 20–25 minutes on each question.

Questions

1. Uniform Accelerated Motion (UAM)
2. Relative Velocity
3. Projectiles
4. Newton's Laws
5. Collisions
6. Circular Motion and Simple Harmonic Motion (SHM)
7. Statics
8. Moments of Inertia
9. Hydrostatics
10. Differential Equations

Comments on each topic

Uniform Accelerated Motion [Question 1]

This is the most popular question in the country with over 90% of students attempting this question. In this topic you will study the *Equations of Linear Motion*. As these equations will be used in just about every question on the paper it is imperative that students study this topic. In general students tend to answer this question well. However, it is important to point out that some of these questions can be tricky and require some lateral thinking.

.....

Relative Velocity [Question 2]

If you get to grips with this question then it is very straightforward. Compared to other questions it is much lighter on the algebra and trigonometry and can be carried out very quickly. The problem is understanding what is going on. You are asked to think what the movement of one body looks like to someone on another moving body – this requires practice if you are to get your head around this concept.

.....

Projectiles [Question 3]

This is also a popular question although it can sometimes be tricky. Your trigonometry needs to be very good to handle Question 3.

Part (a) is usually a question on Projectiles launched from *horizontal* planes.

Part (b) is usually a question on Projectiles launched from *inclined* planes.

Most of the question is fairly predictable. Draw good diagrams and write out the x and y components for each quantity. Interestingly, the computations involved in **part (a)** can often be more difficult than **part (b)**.

Occasionally, you are presented with problems where the particle bounces involving the use of the coefficient of restitution, e.

.....

Newton's Laws (Connected Particles) [Question 4]

This is the next most popular question after Question 1. You cannot do most of the course without studying Newton's Laws. You will learn the important technique of resolving a vector into components on an inclined plane – probably the most important technique in Applied Maths. Many of the questions are fairly predictable allowing students to set up a problem in a standard way receiving most of the marks even if the final answer is wrong.

My main advice for this question is that students should spend plenty of time drawing the diagram and carefully inserting all of the forces. Take your time doing this and satisfy yourself that no forces were left out. At this point start writing out the equations and solving them.

Remember: *Less haste, more speed*

If you rush the diagram leaving out an important force and then dive rapidly into the equations you will probably discover something is wrong. Now you have to go back to the diagram and sort everything out. So start slowly so that you finish quickly.

The hardest topic you could be asked here involves **wedges** where a particle slides down an inclined plane which slides from under it. You need to be very careful with your diagrams drawing separate force and acceleration diagrams.

.....

Collisions [Question 5]

These questions involve standard techniques allowing you to get most of the marks by following a standard procedure. However, your algebra needs to be really good if you are going to get the final correct answer.

Part (a) usually involves direct collisions whereas **part (b)** usually involves oblique collisions.

Circular Motion and Simple harmonic Motion (SHM) [Question 6]

This deals with bodies moving in cycles either in circles or back and forth (SHM). Conservation of energy principles will be used in many problems. Many of the problems are very short. An emphasis is put on understanding concepts rather that carrying out long, laborious calculations. Good students like this question. Doing Question 6 will greatly aid your study of Mechanics in Physics.

Statics [Question 7]

This deals with non-moving (static) bodies like ladders leaning against a wall. The horizontal and vertical forces acting on the body are equal and the turning forces (moments) in a clockwise and anti-clockwise direction are equal.

Moments of Inertia [Question 8]

This deals with rotating bodies. **Part (a)** of this question is a guaranteed 20 marks where you are asked one of three proofs. This is a must-do question because **part (a)** is a banker. You need a knowledge of circular motion to do the rest of this question.

Hydrostatics [Question 9]

This is quite a popular question. Many questions deal with Archimedes principle and the Law of Flotation.

Differential Equations [Question 10]

This question was always popular but it has become even more popular as much of its content has been removed. Because *integration by substitution* is no longer done on the Maths course this means that second order differential equations have been removed as well as more difficult integrals that appear in **part (b)**. Many of the problems in this question will take on a similar appearance to questions that will be examined on the Maths paper. This question is an absolute must!

Questions covered in The Academy

Seven questions will be covered in Sixth year:
Topic 1: Differential Equations (Question 10)
Topic 2: Circular motion and Simple Harmonic Motion (Question 6)
Topic 3: Moments of Inertia (Question 8)
Topic 4: Uniform Accelerated Motion (Question 1)
Topic 5: Newton's Laws (Question 4)
Topic 6: Projectiles (Question 3)
Topic 7: Collisions (Question 5)

Four questions will be covered in Fifth year:
Topic 1: Uniform Accelerated Motion (Question 1)
Topic 2: Newton's Laws (Question 4)
Topic 3: Projectiles (Question 3)
Topic 4: Collisions (Question 5)

General Guidelines

- **Facing Pages**: Examiners have noted that many errors occur when a student turns over the page to continue a question and transcribes work incorrectly from the previous page. Avoid this common error by starting each question on a left facing page. Continuing the question on to the right facing page allows you to view the entire question at once.

- **Units**: The final answer to a numerical problem should contain the units of your answer if appropriate.

- **Marking Scheme**:
  Penalties of three types are applied to candidates' work as follows:

  Slips - numerical slips S(−1)

  Blunders - mathematical errors B(−3)

  Misreading - if not serious M(−1)

  Serious blunders or omissions or misreadings which oversimplifies the question will be awarded the attempt mark only.

Using the Notes

The notes contain all the resource material you require to study the Applied Maths Leaving Cert course. You do not need any other material.
Applied Maths is all about doing problems. You do not have to learn off any definitions or proofs. You succeed in this subject by doing loads and loads of problems.
The notes contain the following:

- A series of worked examples from each part of the course
- These examples are followed by a series of exercises giving you plenty of practice
- Finally the Leaving Cert questions from 1996–2019 are at the end of each section. You will receive the solutions to all of these Leaving Cert questions.