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GREENHEAD COLLEGE MATHEMATICS DEPARTMENT

WHAT COURSES ARE OFFERED?

AS: A one year course assessed by three module examinations.

A-level: A two year course. The one-year AS course is followed by a further year of study, assessed in total by six module examinations. (The three AS examinations and a further three second year examinations.)

There is some flexibility of choice of modules in first and second years. You will be advised on a suitable module "package" depending on your other AS/A-level subject choices.

WHICH AS COURSE SHOULD I TAKE?

Pure Mathematics modules are compulsory (both at AS and A-level) to all courses listed below.

Mathematics with Mechanics is suitable if you want to take AS-level Physics as there is some overlap in content and it is a useful support for Physics in general. You will study two pure modules and one mechanics module on your AS course.

Mathematics with Statistics is suitable if you do not want to take Physics and combines well with any AS-levels. Popular and useful combinations are with Biology, Chemistry, Psychology, Geography and Business Studies. You will study two pure and one statistics module on your AS course.

Mathematics and Further Mathematics (referred to as "Double Mathematics") are two Mathematics A-levels where Further Mathematics A-level (or AS) builds onto the Mathematics A-level content. It is an accelerated course where Mathematics A-level is studied in the first year and Further Mathematics in the second year. These two A-levels are suitable if you have good mathematical ability and you may be considering applying to university to study mathematics, physics or engineering, or you simply enjoy challenging mathematics. Seven pure modules and five applied modules (ie statistics, mechanics and discrete) are studied.

Results:

The average pass rate over the last 3 years is more than 90% for AS-level and 100% for A-level.

ONE-YEAR COURSE AT GCSE LEVEL

If you do not obtain a grade C at GCSE this year, you will have the opportunity to try again at Greenhead. We will encourage you to take a GCSE resit exam in November although we do also offer the modular AQA course studied for a full year. The courses give you the opportunity of working for a grade C which is a requirement for many degree courses and useful in all careers.

Modular Assessment: Three externally set written papers:
 Module 1 March exam
 Module 2 June exam
 Module 3 June exam

Results: The average obtaining grade C or above over the last 3 years is 80%.

MODULAR EXAM SYSTEM

All module examination results are reported back, as a percentage mark, approximately eight weeks after the examination. Consequently you can assess your progress throughout the course and with help from staff can re-assess future strategies for success including the opportunity to resit modules if you continue onto the second year A-level course.

WHY SHOULD I CHOOSE MATHS AS OR A-LEVEL?

If you enjoy Maths and feel confident with the work you have met so far at GCSE higher level, then you should seriously consider Maths. It is a demanding and challenging subject but it can be an extremely rewarding one if you are prepared to put in time and effort.

Maths has wide applications in industry, commerce, science and technology. Maths qualifications can help you towards a future career in these areas.

HOW DO AS AND A-LEVEL COMPARE WITH GCSE?

These courses build on some of the topics which you will have already met at GCSE and take them to greater depth. You will have the chance to study 2 or 3 different branches of Mathematics eg Pure, Mechanics, Statistics and Discrete.

Pure: You may have already met some of the topics studied, eg trigonometry, functions and graphs, algebraic equations, series and calculus. All these and more are included, extended, and taken to a higher level.

Statistics: In Statistics we look at the representation and analysis of data and study how probability can be used to model real life situations. For example, we may wish to investigate a possible link between local rail fares and the number of passengers. You will learn how to interpret statistics and how best to represent findings from collected data.

Mechanics: You may have met some aspects of Mechanics as part of a GCSE Science course. It involves looking at moving bodies (Dynamics) and stationary bodies (Statics) in a given situation. We attempt to represent the situations by algebraic equations and solve them using Pure Mathematics techniques. For example, the police using principles of Mechanics and modelling can investigate whether or not motorists involved in an accident were breaking the speed limit.

Discrete: This is a module you may study in your second year. Much of the work in this branch of mathematics is solving problems concerned with discrete data, using a sequence of instructions. Applications have arisen in recent decades in industry, business and computing alongside the development of computers.

Whichever options you take at AS-level, you will find there is a lot of work involving manipulating algebraic expressions, so your algebra needs to be sound if you want to tackle AS-level. There is also a strong emphasis on producing well explained methods, often supported by clearly drawn diagrams, in order to obtain a final answer.

You will have approximately 4½ hours teaching during the week, and have an average 4 hours homework set per week, normally some after each lesson.

WHAT ARE THE ENTRY REQUIREMENTS?

You will need grade A, B or C at higher level GCSE. Experience has shown us that if students have a grade A or B at GCSE, then initially they tend to encounter fewer problems in the transition from GCSE to A-level and can expect considerable success. The AS syllabus assumes knowledge of certain GCSE topics: attempting AS-level from grade C, therefore, can pose more problems. In this case it is those few students with a high degree of commitment, motivation and willingness to do extra work who then go on to achieve a pass at AS-level. We therefore recommend that preferably you have gained better than a C at GCSE and have a sound background in algebra. To cope with the demands of Further Maths (double maths) we recommend an A or A* at GCSE.

IS THERE ANYTHING ELSE I SHOULD KNOW?

Important GCSE topics:

Because new AS work makes use of GCSE knowledge, we expect you to feel confident with algebraic manipulation and in particular the following topics:

- Simplifying algebraic expressions
- Factorising quadratic expressions
- Solving algebraic equations
- Simplifying expressions with indices
- Working with fractions
- Trigonometry.

Calculators:

You will need to provide your own scientific calculator. Graphic calculators are a useful learning aid but are not essential. Advice on suitable models will be available at the start of your course.

Computers:

The department makes good use of an extensive range of maths software to help you in your learning. Computers and projectors are available in all classrooms, with a further 12 machines in the maths resource area. Access to the internet is available throughout the day, and CD ROMS provide material for revision and supported self-study. We make extensive use of Autograph, the popular maths software for graphs and statistics, and have an extended licence to allow you to have your own copy at home.