**KEY STAGE 4**

**MATHEMATICS**

**Examination Board: CCEA**

**Mathematics** reveals hidden patterns that help us understand the world around us. Nowadays, Mathematics is not just about arithmetic and geometry, it teaches us the techniques we need to problem solve in the modern world. Every discipline uses mathematics, from engineering and science to the world of business and the financial sector.

Mathematics remains a **compulsory subject** at GCSE because employers recognise the need for today’s work force to deal with numerical data, and to be able to understand mathematical models.

The teaching and assessment of GCSE Mathematics will be changing in September 2017. Whilst the specifications are still in **draft format** the aims are as follows and are unlikely to change dramatically:-

* develop fluent knowledge, skills and understanding of mathematical methods and concepts;
* acquire, select and apply mathematical techniques to solve problems;
* reason mathematically, make deductions and inferences and draw conclusions; and
* comprehend, interpret and communicate mathematical information in a variety of forms appropriate to the information and context.

**Specification**

The tables below summarises the assessment structure of the course. Each paper includes structured questions, questions set in contest and some requiring unprompted solution of mutli-step questions.

**Foundation Tier**

|  |  |  |  |
| --- | --- | --- | --- |
| Assessment Components | Assessment | Target Grades | Weighting |
| Unit M2\**Students should know the content of unit* ***M1*** *before taking this unit* | External Examination **with** calculator1h 45 mins | C | 45% |
| Unit M6(Foundation completion test)\**Students should know the content of unit* ***M1, M2 & M5*** *before taking this unit* | Two external written examinations 1hr 10 mins:Paper 1 **without** calculatorPaper 2 **with** calculator | C | 55% |

**Higher Tier: Option 1**

|  |  |  |  |
| --- | --- | --- | --- |
| Assessment Components | Assessment | Target Grades | Weighting |
| Unit M3\**Students should know the content of unit* ***M1 & M2*** *before taking this unit* | External Examination **with** calculator2 hours | B, C | 45% |
| Unit M7(Higher completion test)\**Students should know the content of unit* ***M1, M2, M3, M5 & M6*** *before taking this unit* | Two external written examinations 1hr 15 mins:Paper 1 **without** calculatorPaper 2 **with** calculator | B, C | 55% |

**Higher Tier: Option 2**

|  |  |  |  |
| --- | --- | --- | --- |
| Assessment Components | Assessment | Target Grades | Weighting |
| Unit M4\**Students should know the content of unit* ***M1, M2 & M3*** *before taking this unit* | External Examination **with** calculator2 hours | A\*, A, B, C | 45% |
| Unit M8(Higher completion test)\**Students should know the content of unit* ***M1, M2, M3, M4, M5, M6 & M7*** *before taking this unit* | Two external written examinations 1hr 15 mins:Paper 1 **without** calculatorPaper 2 **with** calculator | A\*, A, B, C | 55% |

**Important:**

***It is possible to interchange units ie a pupil may do M4 and M7 if it increases their chances of getting a better grade.***

CEA report the results of individual assessment units on a uniform mark scale that reflects the assessment weighting of each unit. They determine the grades awarded by aggregating the uniform marks that candidates obtain on individual assessment units and their completion test. (There is currently no more detail on this. The table below shows the conversion table for current specification. The new specification will follow a similar principle.)

Revised Specification (2210 – T series)

The table below illustrates roughly how the UMS grade obtained corresponds to the contribution it would make to a final grade.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Grade | Unit T1, T2, T3, T4 | Completion Test T5 | Completion Test T6 | Award |
| Max Ums | 180 | 220 | 220 | 400 |
| A\* | 162 - 180 |  | 198 - 220 | 360 - 400 |
| A | 144 - 161 |  | 176 - 197 | 320 - 359 |
| B | 126 - 143 |  | 154 - 175 | 280 - 319 |
| C | 108 - 125 | 132 - 153 | 132 - 153 | 240 - 279 |
| D | 90 - 107 | 110 - 131 | 110 - 131 | 200 - 239 |
| E | 72 - 89 | 88 - 109 | 88 - 109 | 160 - 199 |
| F | 54 - 71 | 66 - 87 | (66 – 87) | 120 - 159 |
| G | 36 - 53 | 44 - 65 | (44 – 65) | 80 - 119 |
| U | 0 - 35 | 0 - 43 | (0 – 43) | 0 - 79 |

UMS Explained

The following table is a guideline as to the approximate % grade boundaries for each unit.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| T2 |  |  |  | C – 59% | D – 39% | E – 19% |
| T3 |  |  | B – 67% | C – 46% | D – 28% |  |
| T4 | A\* - 71\* | A – 56% | B – 36% |  |  |  |
| T5 |  |  |  | C – 67% | D – 55% | E – 40% |
| T6 | A\* - 80% | A – 65% | B – 47% | C – 32% | D – 22% |  |

A pupil who scores 59% in T2 would get 108 ums marks.

A pupil who scores 46% in T3 would get 108 ums marks.

A pupil who scores 67% in T5 would get 132 ums marks.

[Note a pupil does not have to get a C standard in both unit and completion paper to achieve a C grade. It is based on overall ums total].

**Setting at Campbell College**

It is the aim for all pupils to sit the Higher specification with the hope to achieve at least a grade B. That said, pupils will be entered at the most appropriate tier to ensure that they are able to reach their potential. Mathematics classes will be timetabled at the same time so it allows for movement within classes as appropriate. The provisional general structure will be as follows:-

Set M1 (Accelerated class) will continue with current legacy specification and sit unit T4 **and** completion paper T6 at the end of Year 11. Anyone who does not get an A\* would have the opportunity to re-sit units in January.

Sets 11M2 - 11M3 will aim to sit unit M3/M4 at the end of Year 11, and completion paper M7/M8 at the end of Year 12. (Higher Tier). Depending on the result of the unit test in Year 11, pupils will be advised which unit test they should take/retake the following year.

Sets 11M4 - 11M5 will aim to sit unit M3 at the end of Year 11, and completion paper M7 at the end of Year 12. (Higher Tier). Depending on the result of the unit test in Year 11, pupils will be advised which unit test they should take/retake the following year.

Set 11M6 (The accelerated Foundation class) will continue with current legacy specification and sit unit T2 **and** completion paper T5 at the end of Year 11. If successful they will have the option to try and improve their grade. Anyone who does not get a C grade would have the opportunity to re-sit units in January.

Set 11M7 will aim to sit unit M2 at the end of Year 11, and completion paper M6 at the end of Year 12.

**Improving Grades**

Unit Tests M1 – M4 **may** be re-taken before certification. i.e. a pupil may resit their Year 11 unit (or take a different unit from the same Tier) the following June. The best result will be used for final grade.

The Completion Test may be re-taken **once only** before certification.

**KEY STAGE 4**

**ACCELERATED MATHEMATICS GCSE & FURTHER MATHEMATICS GCSE**

Pupils selected for Further Mathematics will have two additional periods of Maths on the two-week timetable. Following two years of study, this will result in two separate GCSEs (Mathematics and Further Mathematics). It should be noted that these two additional periods will be delivered when the pupils are scheduled to attend non-examined PE lessons but will not prevent them from attending both games afternoons.

Pupils will sit the normal GCSE course at the end of year 11 and MUST obtain an A/A\* grade to take Further Mathematics in year 12.

**Selection for Further Mathematics**

Only the top Mathematicians in the year will be able to take this subject *(pupils will be selected primarily on the basis of a Qualification Exam, which will take place during Summer Examinations. If a pupil does not meet the set requirement, then their overall exam performance will be reviewed).*

**Specification**

The teaching and assessment of GCSE Further Mathematics will be changing in September 2017. There is one **mandatory** unit (Unit 1) and three optional units (Units 2, 3 and 4). Students must complete **two** units from Unit2, Unit 3 and Unit 4.

|  |  |  |  |
| --- | --- | --- | --- |
| Assessment Components | Assessment | Topic examples | Weighting |
| Unit 1: Pure Mathematics (Mandatory) | External Examination **with** calculator2 hours | Concepts studied at GCSE in more depth eg algebra and trigonometry; new topics, eg logarithms, differential and integral calculus and matrices. | 50% |
| Unit 2Mechanics (Optional) | External Examination **with** calculator1 hour | This looks at the motion of bodies and the effect of forces on bodies. It looks at how Mathematics can help solve problems that involve motion (Kinematics), the effect of forces on a stationary body (Statics) and the effect of forces on a moving body (Dynamics).  | 25% |
| Unit 3Statistics (Optional) | External Examination **with** calculator1 hour | Although you have studied some statistics at GCSE, this extends the work to look at probability, standard deviation, Binomial and Normal distributions. | 25% |
| Unit 4Discrete and Decision Mathematics (Optional) | External Examination **with** calculator1 hour | Time Series, Linear Programming and Logic ie Boolean variables | 25% |

**Further Mathematics at Campbell College**

It is the provisional aim for pupils to complete Units 1, 2 and 3.

***ADVANTAGES OF STUDYING FURTHER MATHEMATICS***

* *Improved Academic Profile*

Pupils selected for Further Mathematics will be able to gain an **extra** GCSE, enhancing their academic profile.

* *Interest*

Further Mathematics is challenging but very rewarding and gives you the opportunity to explore mathematics in more depth.

* *Ability*

Further Mathematics takes you to the next level – some of the concepts you will study are also on AS Level Mathematics!

* *Career Choice*

Many careers within engineering, business, finance, economics, computing and science require a higher level of mathematics than just GCSE.

* *A-Level Choice*

Although not essential for those thinking of taking A-Level, most find Further Mathematics a great advantage. For those thinking of Further Mathematics A-Level, we strongly recommend taking Further Mathematics.

Studies have also shown that people with Mathematics A-Level also tend to earn more on average than people without it. Though this itself may or may not be a good enough reason to study Mathematics, the skills it allows you to develop include problem solving, logic and analysing situations. Add in the improvements to your basic numeracy skills and that bit of creativity needed to solve Maths problems and you've got yourself a set of skills which would make you more desirable for almost any job!