Ifield Community College
Mathematics Department

Head of Department: MFO
Key-stage co-ordinators: DKI, OPE
Teachers: SDA, HRI, LRA

Subject: A-Level Mathematics Year 2
Exam Board: Pearson Edexcel Level 3 Advanced GCE in Mathematics (9MA0)

Overview:
After completing the AS qualification examination in May students start the year 2 A Level Mathematics content in the remaining weeks of the summer term.

Summer Term

Outline of Key Learning	Specification Code
Trigonometry a. Calculating with radians and applying to arcs and sectors b. Applying radians to small angles	**6a, b**
Algebraic Fractions a. Simplify algebraic fractions b. Partial fractions	**2a, b**
Regression a. Change of variable b. Correlation coefficients – hypothesis testing for zero correlation	**1a, b of Statistics**
Probability a. Using set notation for probability b. Questioning assumptions in probability.	**2a, b of Statistics**

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Overview:
Those students that have achieved the required grades at AS continue with the second year of study in September. They will apply the calculus skills learnt in Yr 1 to complex functions. They will deepen their Algebraic and Trigonometric understanding. In the applied modules they will learn to model using the Normal Distribution and solve Dynamics problems that involve friction and forces at an angle.

Autumn Term

Outline of Key Learning	Specification Code
Differentiation a. Differentiation sinx and cosx b. Differentiating logarithms and exponentials c. Differentiating products, quotients, implicit and parametric functions d. Calculate second derivatives e. Apply to rate of change problems	**8a, b, c, d and e**
Functions and Modelling a. Modulus functions b. Composite and Inverse functions c. Transformations d. Modelling with functions such as trigonometric, exponential or reciprocal	**3**
Series and Sequences a. Arithmetic and Geometric progressions b. Sigma notation c. Recurrence and iterations	**4**
Binomial Theorem a. Expanding $(a + bx)^n$ for rational b. Expanding functions using partial functions	**5**

Normal Distribution a. Understand and use the Normal Distribution b. Apply normal distribution to approximate binomial distribution c. Hypothesis testing for the mean of the normal distribution	**3a, b, c of Statistics**
Numerical Methods a. Location of roots b. Solving by Iterative methods c. Newton-Raphson method	**9a, b, c, d**
Trigonometry c. Secant, Cosecant and Cotangent functions d. Compound and double angle formulae and proof	**6c, d**
Forces at any angle a. Resolving forces b. Friction forces	**5 of Mechanics**
Application of Kinematics a. Applying to projectiles	**6 of Mechanics**
Application of Forces a. Equilibrium and statics of a particle b. Dynamics of a particle	**7 a, b of Mechanics**

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Overview:
The main focus in the first half of the term will be to complete the outstanding topics, particularly Integration and Proof. With these complete the students will focus on practicing exam style questions and improving their exam technique.

Spring Term

Outline of Key Learning	Specification Code
Trigonometry e. using and applying $R\cos(x \pm \alpha)$ or $R\sin(x \pm \alpha)$ f. Proving Trigonometric identities g. Solving problems in contexts	**6e, f, g**
Parametric equations a. Definition and converting between parametric and Cartesian forms b. Curve sketching and modelling	**7a, b**
Integration – part 1 a. Integrating exponentials and trigonometric functions b. Using the reverse of differentiation and using trigonometric identities to manipulate integrals	**10a, b**
Integration – part 2 a. Integration by substitution and parts b. Using partial fractions c. Calculate area under graphs or between two curves d. Apply and use trapezium rule e. Differential equations	**11**
Vectors (3D) a. Use of vectors in 3D	**12**
Proof a. Proof by deduction and contradiction	**1**

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A variety of different resources are available to students to assist independent learning.
These include:

- Edexcel A Level Mathematics Textbook
- Student Logins for Integral Mathematics
- Student Logins for Dr Frost Mathematics
- Exam Solutions https://www.examsolutions.net/a-level-maths/ and Maths Genie https://www.mathsgenie.co.uk/alevel.html also provide a useful bank of Exam Style questions
- Revision Guides and Workbooks
- Specification link and further resources: https://qualifications.pearson.com/en/qualifications/edexcel-a-levels/mathematics-2017.html#%2Ftab-AlevelMathematics