Title of Course	Mathematics		
Level	A Level	**Examination Board**	Edexcel
What the subject is about	Mathematics is about understanding and manipulating all of the numerical, geometric, algebraic and statistical connections in the world around us. From the tiniest sub-atomic particle in CERN's LHC to the rate of expansion of the entire universe, everything we know of and about is governed by one equation or another and it is the job of the mathematicians to make sense of this and develop the skills to interact with all of these connections.		
What you will learn	The *essential* **CORE** modules are:		

The *essential* **CORE** modules are:
C1 Algebra and functions; coordinate geometry in the (*x, y*) plane; sequences and series; differentiation; integration.
C2 Algebra and functions; coordinate geometry in the (*x, y*) plane; sequences and series; trigonometry; exponentials and logarithms; differentiation; integration.
C3 Algebra and functions; trigonometry; exponentials and logarithms; differentiation; numerical methods.
C4 Algebra and functions; coordinate geometry in the (*x, y*) plane; sequences and series; differentiation; integration; vectors.

The *optional* **FURTHER PURE** modules are:
FP1 Series; complex numbers; numerical solution of equations; coordinate systems, matrix algebra, proof.
FP2 Inequalities; series, first order differential equations; second order differential equations; further complex numbers, Maclaurin and Taylor series.
FP3 Further matrix algebra; vectors, hyperbolic functions; differentiation; integration, further coordinate systems.

The *optional* **STATISTICS** modules are:
S1 Mathematical models in probability and statistics; representation and summary of data; probability; correlation and regression; discrete random variables; discrete distributions; the Normal distribution.
S2 The Binomial and Poisson distributions; continuous random variables; continuous distributions; samples; hypothesis tests.
S3 Combinations of random variables; sampling; estimation, confidence intervals and tests; goodness of fit and contingency tables; regression and correlation.
S4 Quality of tests and estimators; one-sample procedures; two-sample procedures.

The *optional* **MECHANICS** modules are:
M1 Mathematical models in mechanics; vectors in mechanics; kinematics of a particle moving in a straight line; dynamics of a particle moving in a straight line or plane; statics of a particle; moments.
M2 Kinematics of a particle moving in a straight line or plane; centres of mass; work and energy; collisions; statics of rigid bodies.
M3 Further kinematics; elastic strings and springs; further dynamics; motion in a circle; statics of rigid bodies.
M4 Relative motion; elastic collisions in two dimensions; further motion of particles in one dimension; stability.
M5 Applications of vectors in mechanics; variable mass; moments of inertia of a rigid body; rotation of a rigid body about a fixed smooth axis.

The *optional* **DECISION** modules are:
D1 Algorithms; algorithms on graphs; the route inspection problem; critical path analysis; linear programming; matchings.
D2 Transportation problems; allocation (assignment) problems; the travelling salesman; game theory; further linear programming, dynamic programming; flows in networks.

	As well as all of the **CORE** modules, three other modules must be taken to make us the A-level GCE. (More details about potential routes is offered in the Edexcel Full GCE Specification).
How you will learn	You will learn in a variety of ways, including collaborative team-based, collaborative group-based and independent. Lessons and independent assignments will have a variety of structures and aims. You will complete mini projects, each of which will be assessed (again, in a variety of ways), which develop your skills in preparation for your formal assessments.
Independent learning	Throughout the course, independent learning is essential for progress and you will be expected to review and extend learning that takes place during lessons, as well as prepare for lessons by researching or completing other relevant tasks.
Coursework and Examination Information	All exam-based, the following key Assessment Objective (AOs): **AO1** recall, select and use their knowledge of mathematical facts, concepts and techniques in a variety of contexts. (30%) **AO2** construct rigorous mathematical arguments and proofs through use of precise statements, logical deduction and inference and by the manipulation of mathematical expressions, including the construction of extended arguments for handling substantial problems presented in unstructured form. (30%) **AO3** recall, select and use their knowledge of standard mathematical models to represent situations in the real world; recognise and understand given representations involving standard models; present and interpret results from such models in terms of the original situation, including discussion of the assumptions made and refinement of such models. (10%) **AO4** comprehend translations of common realistic contexts into mathematics; use the results of calculations to make predictions, or comment on the context; and, where appropriate, read critically and comprehend longer mathematical arguments or examples of applications. (5%) **AO5** use contemporary calculator technology and other permitted resources (such as formulae booklets or statistical tables) accurately and efficiently; understand when not to use such technology, and its limitations. Give answers to appropriate accuracy. (5%)
Your future career	Mathematics is central to all STEM disciplines and as such can provide a foundation for understanding of and skills-development in all STEM industries. Its connections with Computer Science, Science, Engineering and Technology underpin its status as both the most employable degree and one of the most adaptable A-level courses.

Staff Contact	Mr Nick Moore Leader of Learning Mathematics Nick.moore@uaesouthbank.org.uk **020 7277 3000**	**Entry requirements**	Grade 7 in Maths