Mathematics of Mechanics
Points of change and areas of stability across National 5, new Higher and new Advanced Higher

The new National Courses at National 5 combine popular and relevant topics of study from Standard Grade and Intermediate 1 and 2 Courses.
The new National Courses at Higher combine popular and relevant topics of study from the existing Higher.
The new National Courses at Advanced Higher combine popular and relevant topics of study from the existing Advanced Higher.

These new Courses also introduce revised content and revised methods of assessment, increasing personalisation and choice for learners.
The **Mathematics of Mechanics** Course is explored through the following areas of study:

National 5 and Higher:	**Advanced Higher:**
There is no Mathematics of Mechanics Course at National 5 or Higher. Progression to the Advanced Higher Mathematic of Mechanics Course is from Higher Mathematics.	♦ Force, Energy and Periodic Motion ♦ Linear and Parabolic motion ♦ Mathematical Techniques for Mechanics

Through these areas of study, learners will develop specific skills for learning, skills for life and skills for work. The development of subject-specific and generic skills is central to all Courses. Learners will develop these skills and techniques in context and they should be made aware of the skills they are developing and of their transferability. It is this aspect of skills development that will help learners progress to further study or the world of work.

This Course will enable learners to: use and extend mathematical skills needed to solve problems in mechanics; consider the state of equilibrium or the movement of a body and interpret the underlying factors using known mathematical methods; analyse the physical factors impacting bodies; understand, interpret and apply the effects of both constant and variable forces on a body; create mathematical models to simplify and solve problems; analyse results in context, and interpret the solution in terms of the real world; develop skills in effectively communicating conclusions reached on the basis of physical factors and calculation.

This Course is highly relevant in many areas of science, engineering and technologies, and offers a sound foundation for future studies in these beyond Advanced Higher.

Course/level	National 5 (SCQF 5)	Higher (SCQF 6)	Advanced Higher (SCQF 7)
Areas/topics of study	There is no Mathematics of Mechanics Course at National 5 or Higher. Progression to the Advanced Higher Mathematic of Mechanics Course is from Higher Mathematics.		The new Advanced Higher is designed to allow flexibility in the delivery of the Course for centres. The following areas of study are new to the new Advanced Higher Course:

		♦ centres of mass ♦ second order differential equations The following area of study is not in the new Advanced Higher Course: ♦ binomial theorem ♦ summation formula ♦ matrix algebra Centres that currently deliver Advanced Higher will be familiar with the following topics or areas of study: ♦ principles of momentum, impulse, work, power and energy ♦ motion in a horizontal circle with uniform angular velocity ♦ simple harmonic motion ♦ motion in a straight line ♦ vectors associated with motion ♦ projectiles moving in a vertical plane ♦ forces associated with dynamics and equilibrium ♦ partial fractions ♦ differentiation ♦ integration ♦ differential equations

Added Value/Course assessment	There is no Mathematics of Mechanics Course at National 5 or Higher. Progression to the Advanced Higher Mathematic of Mechanics Course is from Higher Mathematics.	To achieve the Advanced Higher Course, learners must pass all of the required Units and the Course assessment. **Coursework** There is no Coursework component for this subject. **Question paper** The Course assessment will consist of **one component — a question paper (100 marks)**. This will be externally assessed.
Further information	There is no Mathematics of Mechanics Course at National 5 or Higher. Progression to the Advanced Higher Mathematic of Mechanics Course is from Higher Mathematics.	The details above for Advanced Higher should be read in conjunction with the relevant: **Mandatory documentation:** ♦ Course Specification ♦ Unit Specifications ♦ Course Assessment Specification **Advice and guidance:** ♦ Course and Unit Support Notes **Assessment:** ♦ Unit Assessment Support materials: judging evidence table ♦ Question paper: — specimen question paper: general marking principles; detailed Marking Instructions