# Access to H.E.
# National Programme Unit

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| Unit Title: | Differentiation | | |
| Graded Unit Code: | GA33MTH14 | Ungraded Unit Code: | UA33MTH14 |
| Pathway(s): | Computing<br>Science and Engineering<br>Construction and the Built Environment | | |
| Module(s): | Maths for Computing<br>Mathematics | | |
| Level: | 3 | Credit Value: | 3 |
| Valid from: | 1st August 2014 | Valid to: | 31st July 2024 |

**The following QAA grade descriptors must be applied if you are delivering the graded version of this unit:**

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| 1 | Understanding of the subject |
| 3 | Application of skills |
| 7 | Quality |

| LEARNING OUTCOMES | ASSESSMENT CRITERIA |
|---|---|
| **The learner will:** | **The learner can:** |

| LEARNING OUTCOMES | ASSESSMENT CRITERIA |
|---|---|
| **The learner will:** | **The learner can:** |
| 1. Understand the principles of differentiation and use differentiation to solve problems | 1.1 Correctly use the notation f'(x) or $\frac{dy}{dx}$ to represent derivatives of functions<br>1.2 Differentiate polynomial expressions<br>1.3 Use first order differentials to find the gradient to a curve for different values of x<br>1.4 Determine equations for the tangent and the normal at specific points on a curve, e.g. $y = ax^n$, $y = ax^2 + bx + c$<br>1.5 Use first order differentials to determine the maxima and minima for polynomial expressions<br>1.6 Use first order differentials to determine rates of change and solve problems |
| 2. Use differentiation to sketch quadratic and cubic equations | 2.1 Find the co-ordinates of turning points and sketch the graphs of straightforward polynomial functions of third order or less |
| 3. Understand the use some standard derivatives. | 3.1 Solve problems involving the derivatives of the functions $e^{kx}$, $\ln x$, $\sin kx$ and $\cos kx$<br>3.2 Solve problems involving derivatives of functions in the form $f(x)g(x)$ and $f(g(x))$ |