

# SPA5319 Quantum Mechanics A

## Mathematical Prerequisites

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As a minimum, please make sure that you are able to do the following:

- Differentiation of simple functions, e.g.

$$\frac{d^2}{dx^2} \left( e^{-\frac{ax^2}{2}} \right) .$$

- Integration of simple functions, e.g.

$$\int N^2 dx \quad \text{and} \quad \int \cos^2 \left( \frac{n\pi x}{L} \right) .$$

- Know the exponential and/or trigonometric solutions to the following differential equations:

$$\frac{d^2\Psi}{dx^2} = -k^2\Psi \quad \text{and} \quad \frac{d^2\Psi}{dx^2} = \alpha^2\Psi .$$

- General algebraic manipulation, fractions, factorisation, completing the square *etc.*
- The basics of complex numbers, including complex conjugates and Euler's formula ( $e^{ix} = \cos x + i \sin x$ ).