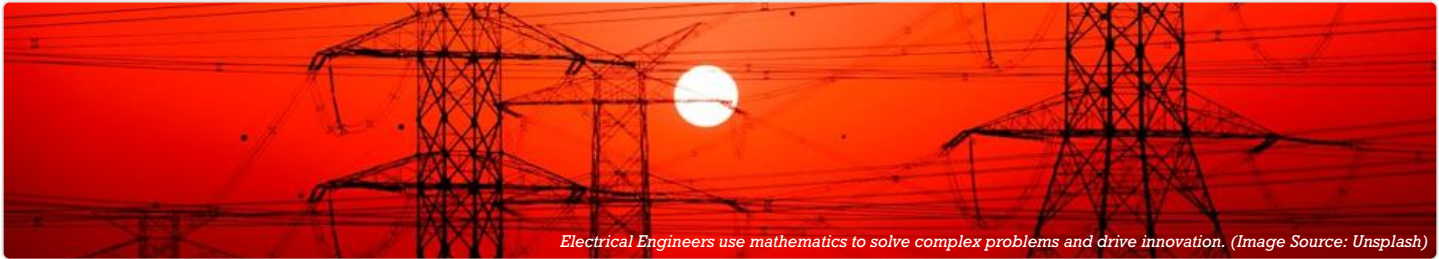


CAREERS THROUGH MATHS: ELECTRICAL ENGINEER



Electrical Engineers use mathematics to solve complex problems and drive innovation. (Image Source: Unsplash)

JOB OVERVIEW

Electrical Engineers in the UK are responsible for designing, developing, and maintaining a vast array of electrical systems and components. Their work is fundamental to modern life, from the power generation that lights our homes to the complex electronics in our smartphones. A typical day can involve a mix of computer-aided design (CAD), project management meetings, laboratory testing, and on-site inspections. For instance, an engineer at a firm like Rolls-Royce might design the electrical power systems for a new jet engine, while an engineer at National Grid could be planning the integration of a new offshore wind farm into the national transmission network.

KEY MATHS APPLICATIONS

Primary Areas:

- **Calculus (Differential and Integral):** This is fundamental for analysing how electrical systems change over time. Differential equations are used to model the behaviour of dynamic systems, such as...
- **Complex Numbers and Algebra:** The analysis of AC circuits, which form the backbone of the UK's power distribution, relies heavily on complex numbers.
- **Fourier Analysis:** This mathematical tool is essential for understanding non- sinusoidal waveforms, which are common in modern electronics due to devices like inverters and...

ESSENTIAL SKILLS & TOOLS

SKILL	APPLICATION
EPLAN)	Used to create precise schematic diagrams and wiring Computer-Aided Design layouts.
Technical Communication & Reporting	The ability to present complex mathematical findings clearly is crucial.
Quality & Standards Compliance (e.g., ISO 9001, BS 7671)	Applying statistical methods for quality assurance and a rigorous understanding of the...

TYPICAL PATHWAY

The most direct route begins with strong GCSEs (or Scottish Nationals) in Mathematics and Physics, followed by A-levels (or Scottish Highers) in these subjects, often supplemented by Further Mathematics.

INDUSTRY DEMAND

The demand for Electrical Engineers in the UK remains strong, driven by major national initiatives such as the transition to net-zero carbon emissions, which requires massive investment in renewable energy, smart grids, and electric...

REAL-WORLD IMPACT

Electrical Engineers are at the forefront of solving some of the UK's biggest challenges. They are designing the offshore wind farms in the North Sea that are decarbonising the UK's energy supply, developing the communication systems that...

QUICK FACTS

- **Education:** GCSEs (or Scottish Nationals) in Mathematics and Physics, followed by A-levels (or Scottish Hig
- **Growth:** The demand for Electrical Engineers in the UK remains strong, driven by major national initiatives such as the transition to net-zero carbon emissions, which requires massive in...