

# **NFEC Annual 2018 Conference**

## **29 November 2018**

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# Royal Academy of Engineering

We bring together the most successful and talented engineers from across the profession – our Fellows – to advance and promote excellence in engineering for the benefit of society.

We harness their experience and expertise to provide independent advice to government, to deliver programmes that help exceptional engineering researchers and innovators realise their potential, to engage the public with engineering and to provide leadership for the profession.

We bring together engineers, policy makers, entrepreneurs, business leaders, academics, educators and the public in pursuit of these goals.

Engineering is a global profession, so we work with partners across the world to advance engineering's contribution to society on an international, as well as a national scale.

# Royal Academy of Engineering

We have three strategic priorities:

- Make the UK the leading nation for engineering innovation and businesses
- Address the engineering skills and diversity challenge
- Position engineering at the heart of society

# Overview of Academy activity



**Supporting  
excellent research**



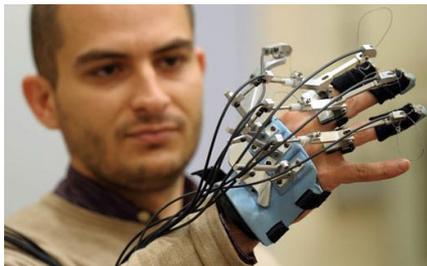
**Engineering Policy**



**Education and skills**



**International**



**Enterprise and  
innovation**



**Public engagement  
and  
communications**



**National awards  
and events**



**QE Prize for  
Engineering**

# Overview of education activity

**Changing perceptions: Engineering Talent Project**

**Diversity and Inclusion**

**Research and Policy**

**Education Programmes**

# Overview of education activity

Changing perceptions: Engineering Talent Project

Diversity and Inclusion

Research and Policy

## Education Programmes

### Schools

- Connecting STEM Teachers
- STEM Resources
- Regional programmes

### Further Education

- Visiting Teaching Engineers
- Contextualised resources
- CPD

### Higher Education

- Visiting Professors
- Engineering Leadership Scholarships
- Graduate Engineering Engagement Programme

### Professional

- Sainsbury Management Fellowships

# Visiting Teaching Engineers (VTEs)

- Provides funding to appoint a female engineer or technician as a visiting teacher
- Up to 10 days for up to a year

## What are the Benefits?

- Brings industry and colleges closer together
- Provides students with real-life industrial contexts
- Provides ad-hoc mentoring and careers advice to students
- For full-time level 3 technician course
- Up to £3,500 to be used as an honorarium

# **Free engineering contextualised resources for level 3**

- A series of engineering resources with interactive elements that cover engineering
- Electrical and mechanical and electrical principles
- Developed in response to requests from college lecturers
- They start of with a real-life problem to solve
- They develop the engineering science and relevant mathematics to solve the problem

# Resources continued

## What are the Benefits?

- Contextualised problem statement
- Background theory
- Interactive elements to test theory
- Free to use
- Free up teaching time
- Stretch and challenge activities
- Model answers

# Resources continued

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## **Current Resources**

- AC phasors & fault detection
- AC power & power factor
- Filtering AC signals
- Centre of gravity of composite bodies
- Forces, centre of gravity, reactions & stability
- Friction & sliding
- Force on a dam

## **Draft Resources**

- Kirchhoff's laws
- AC characteristics and AC waveform addition
- Solenoid valve – Magnetism
- Co-planar forces on a crane
- Motion of a tube train – SUVAT
- Fireboat projectiles – SUVAT equations in two dimensions

These need to be reviewed and tested please let us know if you can review any of them

Frequency

Phase angle  +60°

resource by www.grallator.co.uk

50.0 Hz

R 47.0 Ω    L 220.0 mH    C 100.0 μF

	Resistance, R	Reactance, X	Impedance, Z
R	47.000 Ω	0 Ω	47.000 Ω / 0°
L	0 Ω	69.115 Ω	69.115 Ω / +90°
C	0 Ω	31.831 Ω	31.831 Ω / -90°
Total	47.000 Ω	37.284 Ω	59.993 Ω / 38.4°

Diagram scaled to show relative magnitudes

Inductive

V = IZ

resource by www.grallator.co.uk

mg = 9.810 N  
R = 9.476 N  
Moment = 0.000 Nm  
about lower corner

Stable

1 2 3

shape

m = 1.0 kg  
w = 20.0 cm  
h = 20.0 cm

θ = 15°

resource by www.grallator.co.uk

New

6 kg    2 kg

10    10

Slide the arrow to the correct position to balance the weights. Press the 'Balance' button to check.

Balance

resource by www.grallator.co.uk

## Free CPD

- In 2019, we will be offering a series of free CPD
- Hosted in an engineering company
- Including a tour of the facilities
- Talk and presentation of their engineering operations
- Opportunities to build relationships with employers
- Networking with other practitioners
- Sharing of resources and best practice
- Create a better learning experience for all students
- New pedagogies
- Introduction to the resources and discussions of maximising their use

## **Free CPD continued**

- BP Upstream Learning Centre (ULC), Sunbury-on-Thames  
- 27 March 2019 (Drill simulator)
- Warwick Manufacturing Group (WMG) - International  
Manufacturing Centre - 06 February 2019
- Rolls Royce Learning & Development Centre, Derby
- Ricardo Technical Centre, Shoreham-by-sea
- Royal Mint, Llantrisant
- Bombardier Aerospace, Belfast

**Thank you.**

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