

# Engineering Diplomas The Experience to Date

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## Background

These are the diplomas mentioned in the Government White Paper '14-19 Education and Skills' 23 February 2005. This announced a new system of Diplomas for 14-19 year olds.

The proposed Diplomas will cover "the main occupational areas of the economy"..

## Nomenclature

- While the working title for these new qualifications was 'Specialised Diplomas' following market research the government asked that use of the term specialised be avoided in relation to Diplomas, as the word implies a reduction in young people's future options

## What are they?

- The Diploma will be a 'made to measure' qualification designed by employers to educate the potential young engineers of the future, so that industry has the high calibre human resources needed to meet its challenges.
- It will be recognised by leading universities across England as a route of equal value to A-Levels

## What do they do?

**They will offer industry-related content, through a blend of academic and work-oriented learning, encompassing:**

- academic knowledge, personal and employability skills developed in the context of engineering sector.
- key engineering occupations, including the customer experience, and career pathways within the sector
- functional skills in Mathematics, English and ICT
- the option to study languages.

## Who delivers them?

- The Diploma will be delivered mainly in schools, working in partnership with FE colleges and employers.
- At present a selection system is in place to ensure only those ready to teach them will run them.

## Timetable

- September 2008
  1. Society, health and development
  2. ICT
  3. Creative and media
  4. Construction and the built environment
    - Constructionskills, summitskills, assetskills EUskills, proskills, ecitb
  5. Engineering
    - SEMTA, automotive skills, cogent, EUskills, summitskills

## Timetable

- September 2009
  1. Land-based and environment
  2. Manufacturing
  3. Hair and beauty
  4. Business administration and finance
  5. Hospitality and catering

## Timetable

- September 2010
  1. Public services
  2. Sport and leisure
  3. Retail
  4. Travel and tourism
- September 2011 Postponed to 2012
  1. Science
  2. Humanities
  3. Language
- September 2013
  - National entitlement

## Structure

Foundation Level 1	600 glh	comparable in terms of average length of study to 4 or 5 CSEs D to G
Higher Level 2	800 glh	comparable in terms of average length of study to 5 or 6 CSEs A to C
Advanced Level 3	1,080 glh	comparable in terms of average length of study to 3 GCE A Levels
Extended Diploma		Equivalent to 4.5 A levels but watch this space!

## Structure of Diplomas in Engineering

Level	1	2	3
<b>Total (GLH)</b>	600	800	1080
<b>Principal learning (GLH )</b>	240	420	540
<b>Generic learning (GLH)</b>	240	200	180
<b>Additional and specialist learning (GLH)</b>	120	180	360

## Level 3 What is in the Principle Learning?

Theme A: The engineered world 60 GLH

Theme B: Discovering engineering technology 270 GLH

Theme C: Engineering the future 60 GLH

Theme D: Analytical methods for engineering 150 GLH

[http://www.ocr.org.uk/qualifications/engineering\\_level3.html](http://www.ocr.org.uk/qualifications/engineering_level3.html)

## Level 3 Generic learning

- Extended project
- 10 days work experience.

## Additional and Specialist Learning

- 360 GLH to customise the diploma
- **Engineering Mathematics** 180 GLH
  - Builds on first maths in Analytical Methods for Engineers
  - Matches degree entry requirements
  - Developed by Maths Task Group set up ESC with members drawn from EDDP, EPC, ECuk, IMA, RAEng

## Assessment

QCA 14 March 2007

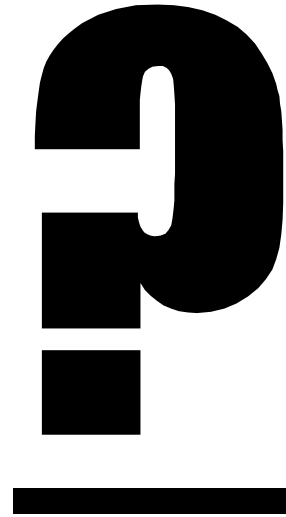
Still not clear BUT

- 6 grades plus fail (now A\*, A, B, C, D, E and U)
- PL and Project
  - each unit expressed in unit marks but reported as unit grade
  - Unit grades converted to points, points aggregated for SCORE
  - SCORE converted to grade!!
- ASL assessed separately BUT must be passed

**HOWEVER**

Transcript of all units will be given

## Any Questions



## More details

### Start

- Timetable
- Structure
- Principal learning
- Analytical methods unit
- Engineering mathematics
- STOP

## Advanced: theme A The Engineered World

This theme provides the learner with the opportunity to understand how engineering businesses operate, their processes and the internal and external factors such as environment awareness, sustainability and employee welfare that affect the business. The theme also develops knowledge and understanding of careers in engineering

60 GLH

## Advanced: theme B Discovering Engineering Technology

- This theme provides learners with the opportunity to gain an understanding of the importance and breadth of the technologies used in engineering.
- They will study the design, control systems, manufacturing processes and maintenance of engineered products.
- They will learn to use the skills and knowledge they acquire through practical activities, which involve applying mathematical and scientific analysis, and design to tasks. Learners will gain experience of planning, testing and using computer-based simulations. Learners will also be involved in using computers and equipment to understand and create the practical aspects of engineering production, manufacturing and maintenance.

270 GLH

## Advanced: theme C Engineering the future

- This theme will allow the learner to understand the relationship between innovative engineering design and business success.

60 GLH

## Advanced: theme D Analytical methods for engineering

- This theme provides learners with the knowledge, skills and understanding of mathematical and scientific principles used by engineers in analysis, design and problem solving
  - Topic 8: Mathematical techniques and applications for engineers **60 GLH**
  - Topic 9: Scientific principles and applications for Engineers **90 GLH**

## Topic 8: Mathematical techniques and applications for engineers 60 GLH

### **Purpose**

- This topic will enable learners to develop knowledge and understanding of mathematical methods used by engineers in analysis, design and problem solving. Learners will develop an understanding of the applications of geometry, trigonometry, algebra and calculus in real engineering situations.

## Skills

Learners will develop skills in:

- mathematical applications
- using mathematical modelling and mathematical techniques
- identifying mathematical solutions to real world problems

## Scope of content

Learners will develop knowledge and understanding of:

- trigonometric identities and equations for statics and dynamics, electrical laws, power factor correction, signals, phasors
- geometry, coordinate systems, vectors
- algebra, quadratic equations, indices, binomial expansion, partial fractions
- calculus, differentiation, integration, maxima and minima, rates of change, exponential decay, applications in mechanics
- mathematical modelling, moments and centres of mass, kinematics, Newton's law of motion
- statistics, data analysis
- work, energy, friction and machines..

# Engineering Mathematics

Maths models in engineering	Proportion and linear laws	Polynomial curves
Functions	Trig functions and identities	Exponential and log functions
Sequences and series	Rates of change and differentiation	Stationary points and optimisation
Indefinite integration	Definite integration and applications	Further techniques of integration
Factor and remainder theorems	Complex numbers	Vector methods
Matrices and determinants	Modelling with differential equations	Geometric and conic sections
2d and 3D geometry	Descriptive statistics	Probability

# 14 to 19 Diploma in Engineering

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