

A REPORT ON THE SHORTAGE OF ENGINEERS

Institution of
**MECHANICAL
ENGINEERS**

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Engineering Director

8 January 2013

www.imeche.org

Improving the world through engineering

AGENDA.

- 01 Shortage estimates
- 02 Skill requirements
- 03 Current trends
- 04 The Perkins Review
- 05 Summary



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SHORTAGE ESTIMATES TRADITIONAL IMAGE

“Prediction is very difficult, especially if it’s about the future”

Nils Bohr



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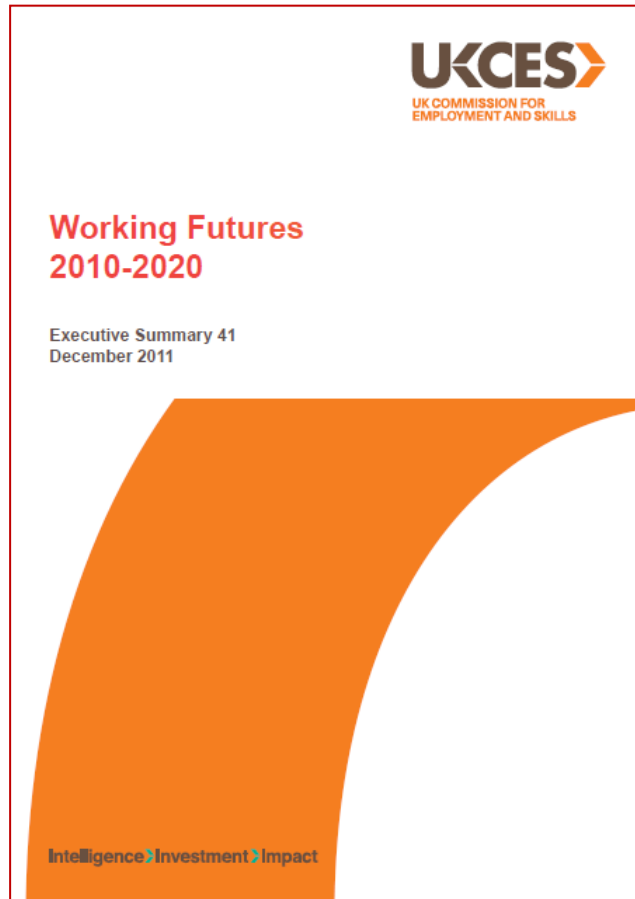
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SHORTAGE ESTIMATES KEY RESEARCH



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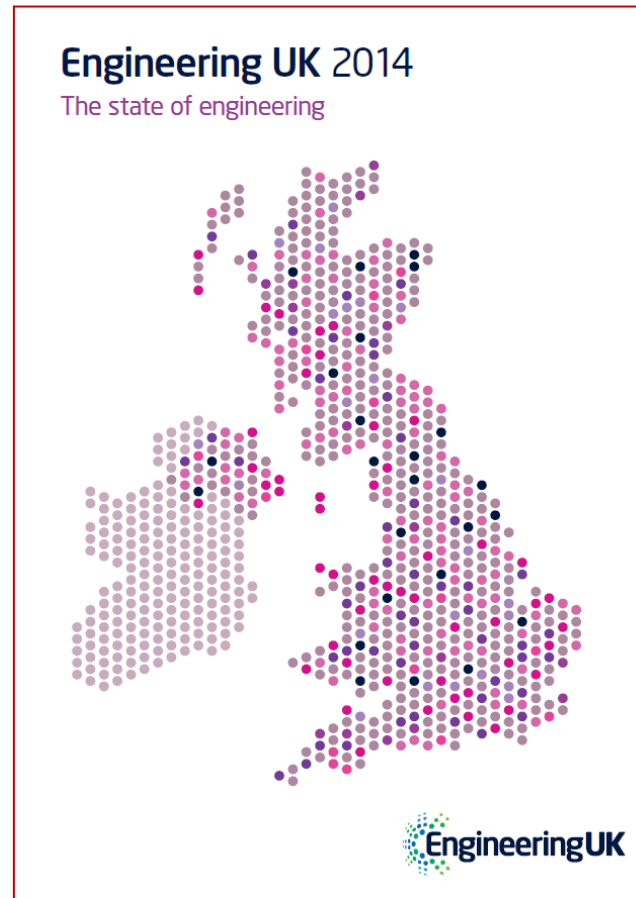
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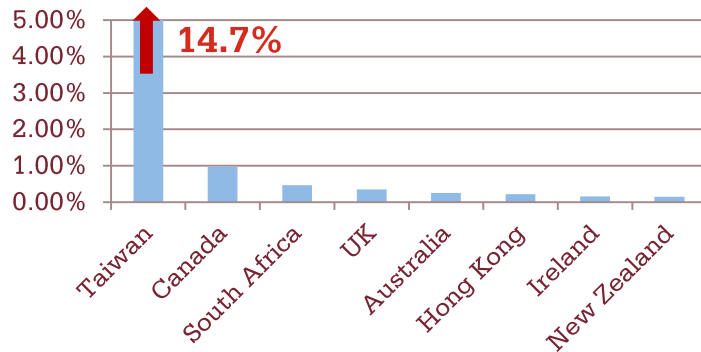
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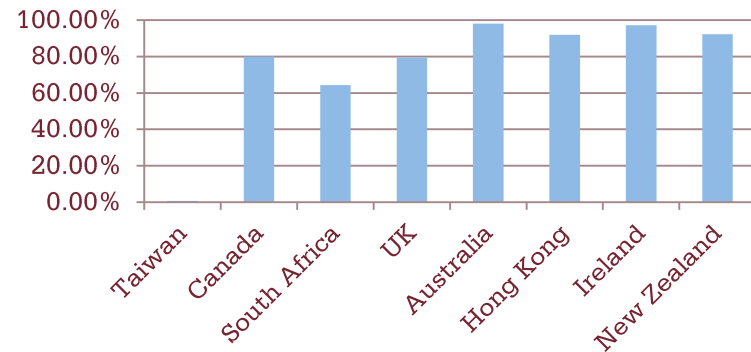
SHORTAGE ESTIMATES INTERNATIONAL CONTEXT

Engineering Council data (2013)

Percentage of Population who are Registered Engineers



Percentage of Engineers who are CEng equivalent



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SHORTAGE ESTIMATES REPLACEMENT VS GROWTH.

Working Futures 2010 - 2020

	Growth by 2020 (in thousands)	Replacement demand by 2020 (in thousands)	Total demand by 2020 (in thousands)
Jobs likely to require engineering skills	204	1,656	1,860
Those needing qualifications at Level 4 and above			865
Those needing qualifications at Level 3			692
Other			303



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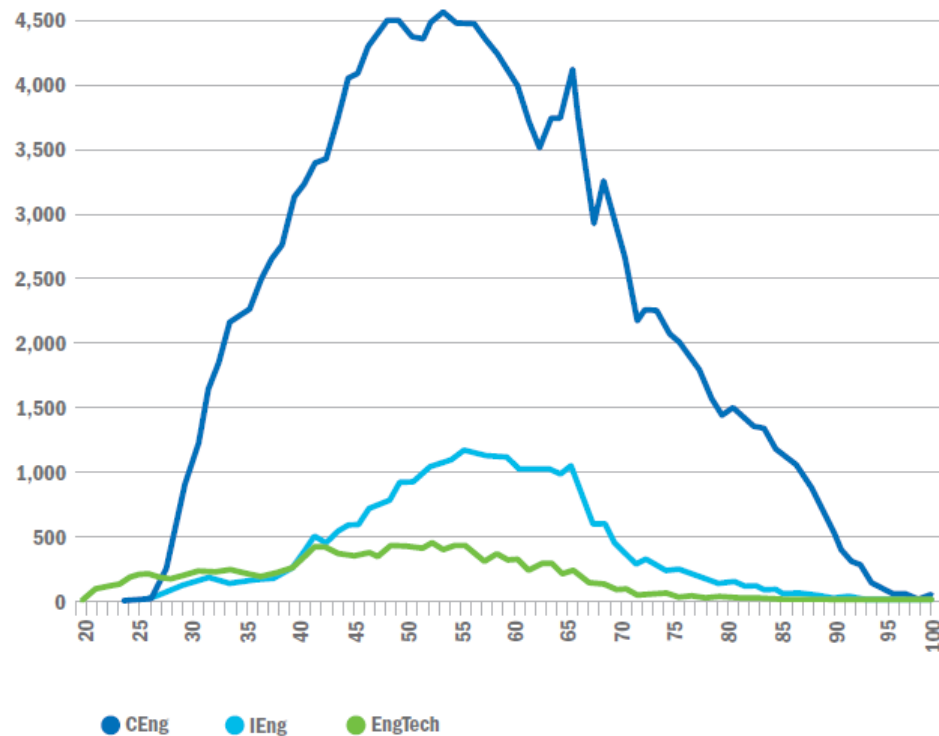


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SHORTAGE ESTIMATES REPLACEMENT VS GROWTH.

Age distribution of Registered engineers



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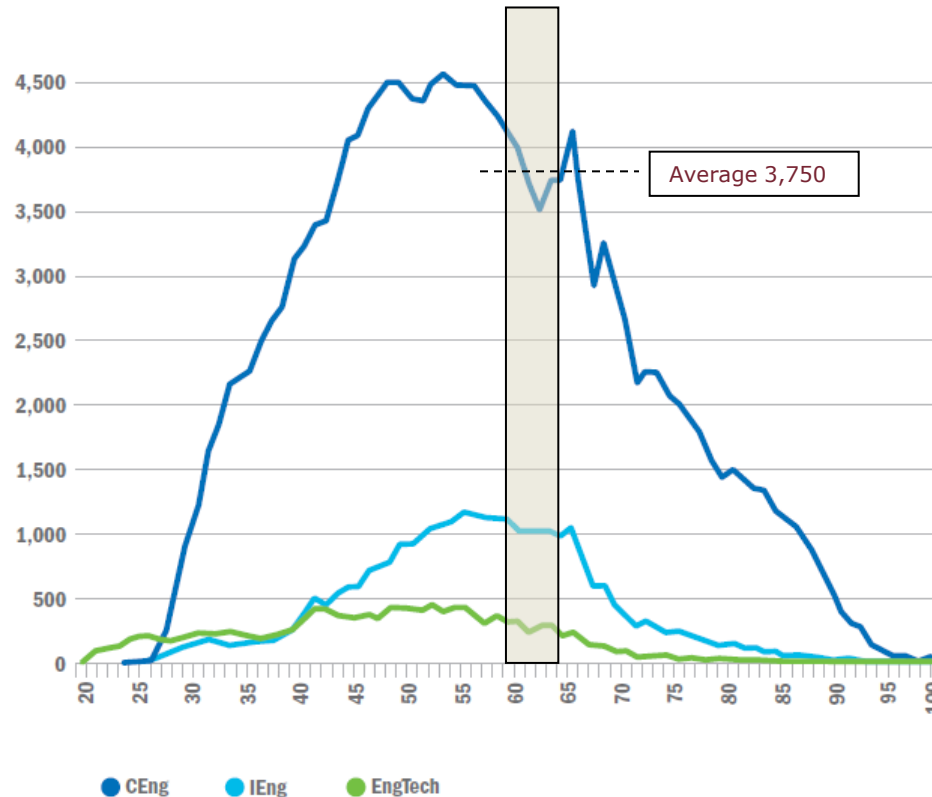


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SHORTAGE ESTIMATES REPLACEMENT VS GROWTH.

Registered engineers nearing retirement



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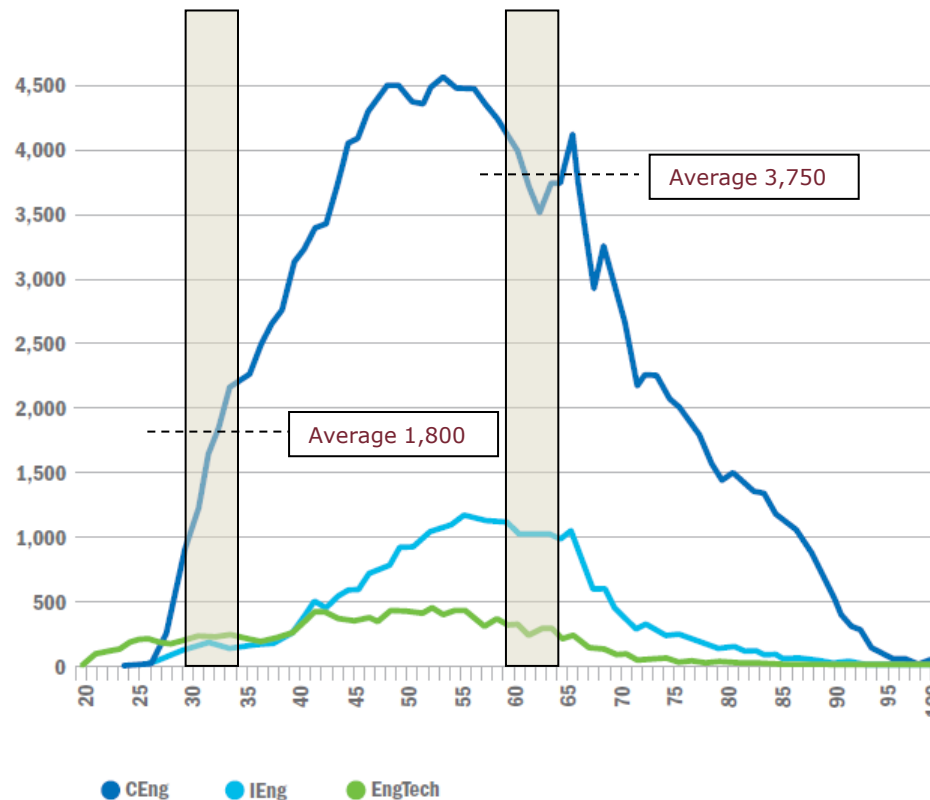


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SHORTAGE ESTIMATES REPLACEMENT VS GROWTH.

Young engineers joining the Register



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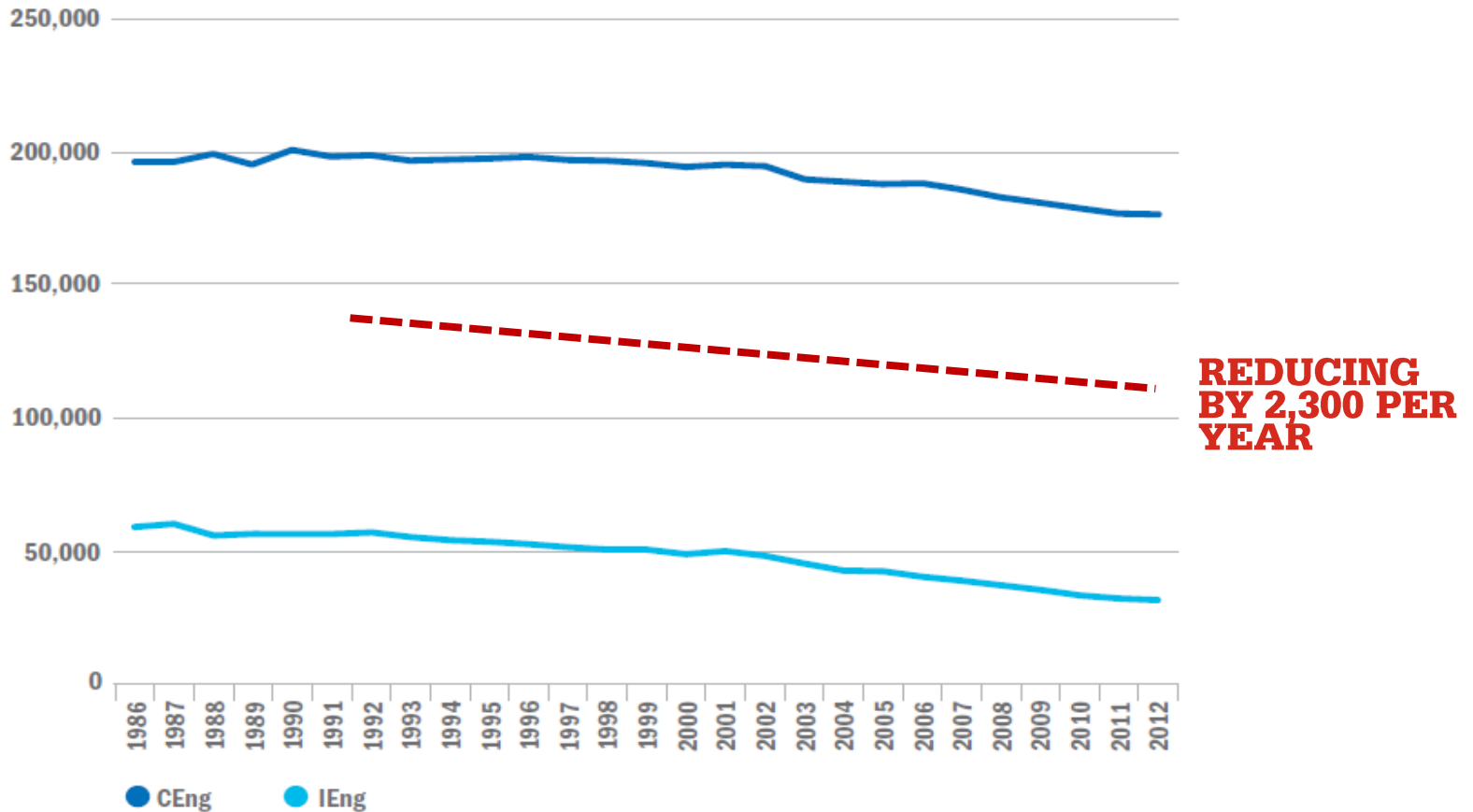
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SHORTAGE ESTIMATES OVERALL REGISTER.



Source: Engineering Council Annual Registration Statistics 2012



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SHORTAGE ESTIMATES REGIONAL PROFILE

	Total engineering demand by 2020 (in thousands)	Total population of each Region (in thousands)	Engineering as a percentage of the population of that Region
England	1,541	53,010	2.91%
Scotland	160	5,290	3.02%
Wales	103	3,060	3.37%
Northern Ireland	56	1,810	3.09%
Total	1,860	63,170	2.94%



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SKILL REQUIREMENTS SKILL PROFILE.

Qualification requirements (aged 19-64)

	2000		2010		2020 (projected)	
	%	Numbers In thousands	%	Numbers In thousands	%	Numbers In thousands
Level 7-8	3.8	1,359	8.0	3,035	12.6	4,969
Level 4-6	20.1	7,089	25.7	9,721	31.5	12,441
Level 4+	23.9	8,449	33.7	12,756	44.1	17,410
Level 3	18.9	6,663	19.7	7,446	17.2	6,782
Level 2	20.2	7,129	19.7	7,437	18.6	7,347
Level <2	37.1	13,107	27.0	10,199	20.0	7,906
Level 1	19.3	6,805	16.4	6,187	14.3	5,649
No qualifications ⁸⁷⁴	17.8	6,301	10.6	4,013	5.7	2,257



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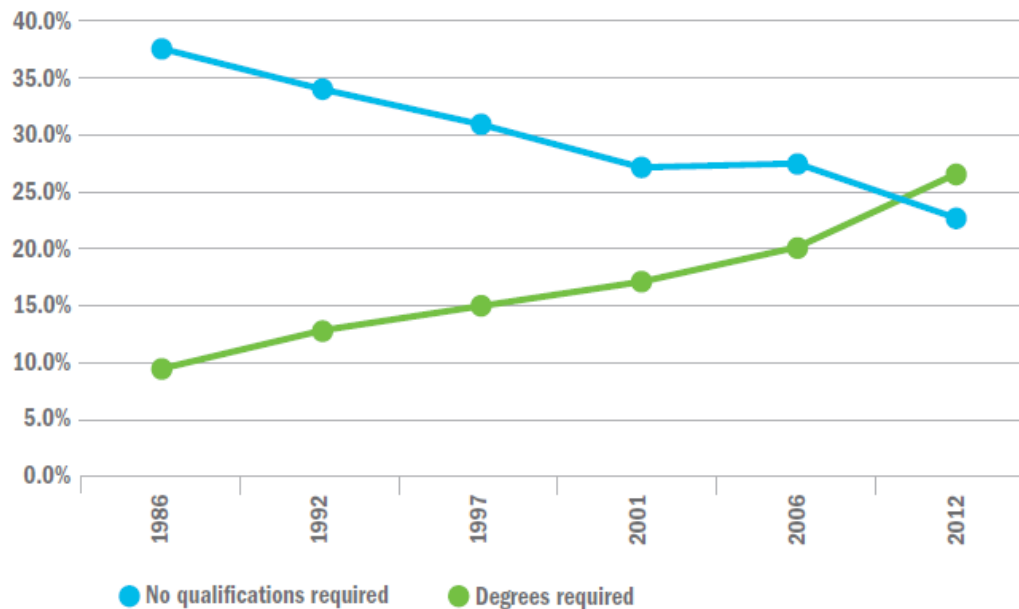


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SKILL REQUIREMENTS SKILL PROFILE.

Qualification requirements (1986-2012)



Source: *Skills at Work in Britain: First Findings from the Skills and Employment Survey 2012*, Alan Felstead, Duncan Gallie, Francis Green and Hande Inanc, 2013, p3



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CURRENT TRENDS STARTING SALARIES.

Average degree
starting salaries
by subject area

(HESA)

	2010/11	2011/12
Medicine and dentistry	£32,546	£32,037
Engineering and technology	£25,762	£26,019
Veterinary science	£25,630	£25,394
Business and administrative studies	£25,458	£24,753
Subjects allied to medicine	£23,238	£22,986
Mathematical sciences	£23,142	£22,942
Architecture, building and planning	£22,956	£22,375
Computer science	£22,562	£22,211
Education	£22,938	£22,126
Combined subjects	£24,712	£22,001
Social studies	£22,107	£20,945
Physical sciences	£21,547	£20,346
Law	£21,252	£20,083
Historical and philosophical studies	£19,064	£17,717
Biological sciences	£18,807	£17,055
Agriculture and related subjects	£18,232	£17,053
Languages	£18,077	£16,495
Mass communications and documentation	£16,806	£15,957
Creative arts and design	£15,884	£14,260
Average for all graduates	£22,274	£21,362



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CURRENT TRENDS AVERAGE EARNINGS.

Average earnings

(Roevin)

Job title	(Jun-2013)	(Jun-2012)
Aerospace quality engineer	£33,500	N/A
Architect	£52,814	£60,004
Automotive engineer	£31,250	£32,297
Building surveyor	£31,824	£32,916
Cad technician	£25,926	£24,140
Chemical engineer	£39,615	£40,954
Civil Engineer	£30,480	£32,618
Electrical engineer	£33,269	£32,640
Facility manager	£38,564	£37,658
Mechanical engineer	£31,280	£30,601
Quantity surveyor	£37,580	£37,923
Stress engineer aerospace	£37,000	£43,579
Structural engineer	£34,181	£30,497
Town planner	£28,357	£36,578



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CURRENT TRENDS HIGHER EDUCATION.

First degrees achieved in UK 2012

	First	Upper second	Lower second	Thrd/ Pass	Unclassified	Total number of qualifiers	Percentage of degrees at first or upper second	Percentage of degrees at first or upper second (when unclassified is excluded)	Percentage of degrees unclassified
Biological sciences	5,505	17,565	10,090	1,985	775	35,920	64.2%	65.6%	2.2%
Physical sciences	3,395	6,855	3,895	895	320	15,360	66.7%	68.2%	2.1%
Mathematical sciences	2,360	2,590	1,710	590	195	7,445	66.5%	68.3%	2.6%
Computer science	3,195	5,350	4,185	1,625	875	15,225	56.1%	59.5%	5.7%
Engineering and technology	5,655	9,075	5,685	1,635	1,550	23,595	62.4%	66.8%	6.6%
Total STEM	20,110	41,435	25,565	6,730	3,715	97,545	63.1%	65.6%	3.8%
All subject areas	61,605	178,425	100,310	23,930	26,715	390,985	61.4%	65.9%	6.8%

Source: HESA student record 2011/12



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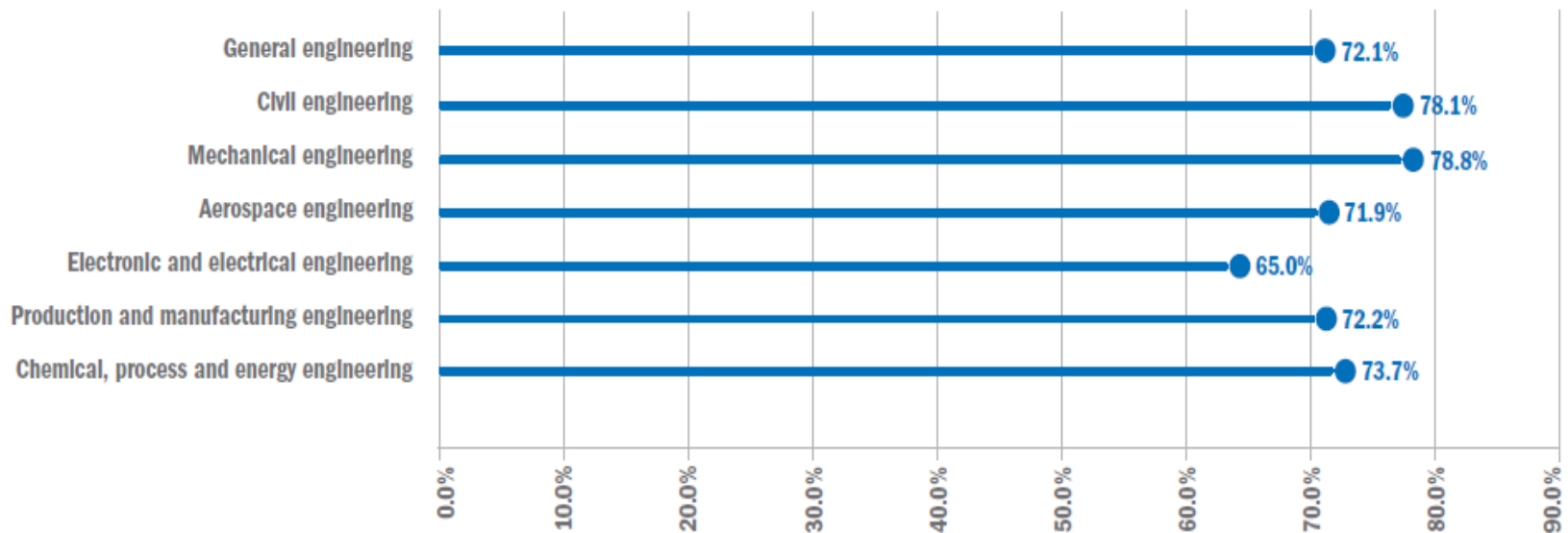


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CURRENT TRENDS GRADUATE EMPLOYMENT.

% of graduates staying in engineering



Source: HESA/Destination of Leavers from Higher Education Institutions



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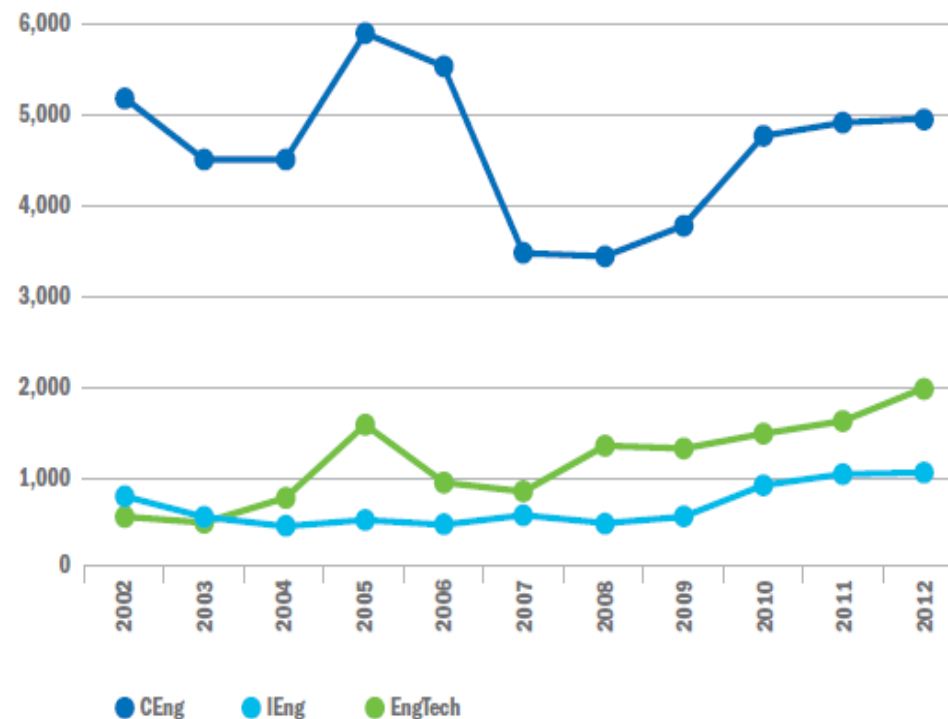


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CURRENT TRENDS NEW REGISTRATIONS.

Engineering Council Registrations (2002-2012)



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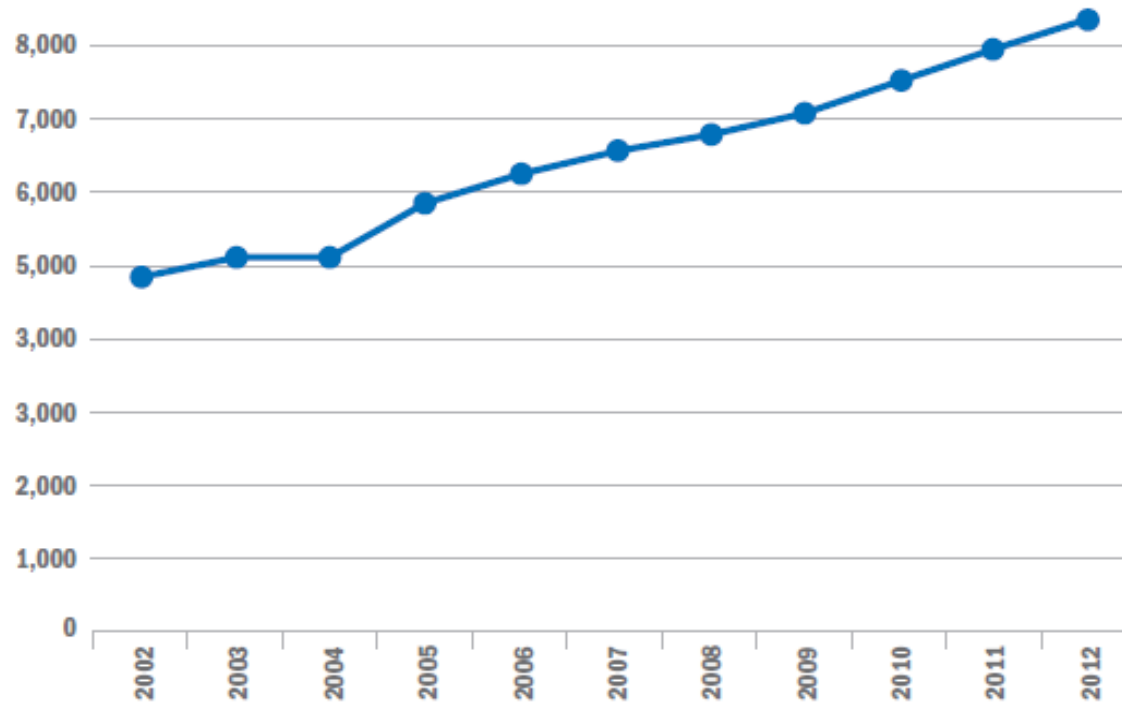


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CURRENT TRENDS TOTAL FEMALE CEng.

Increasing by 350 per year



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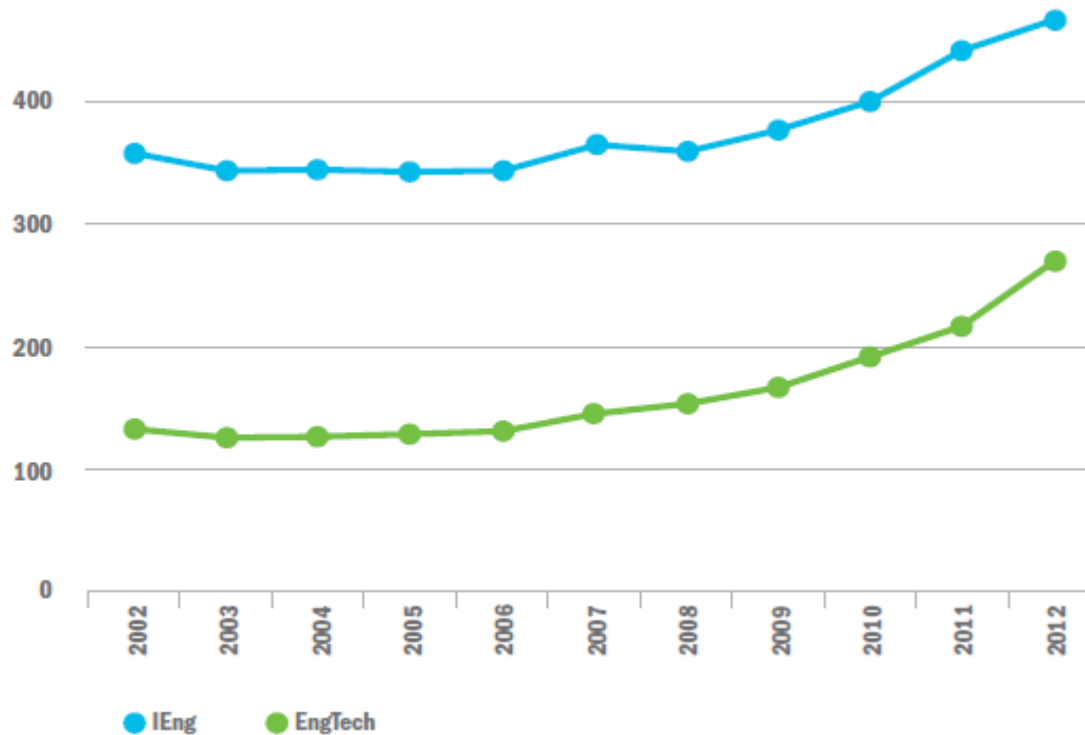
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CURRENT TRENDS

TOTAL FEMALE IEng & EngTech.

Increasing by 20 (each) per year



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CURRENT TRENDS APPRENTICESHIPS.

Top Ten Apprenticeships (2011/12)

	Total number of Apprenticeships	Percentage Female	Percentage of qualifications at Advanced Level (3+)
1. Customer Service	31,370	64.4%	21.1%
2. Business Administration	23,830	77.3%	35.9%
3. Retail	21,420	65.6%	9.2%
4. Health and Social Care	21,200	82.7%	38.6%
5. Management	17,710	63.1%	44.6%
6. Hospitality and Catering	17,700	53.2%	17.9%
7. Children's Care	15,650	95.3%	59.3%
8. Engineering	11,260	4.4%	50.2%
9. Active Leisure	11,230	26.8%	22.4%
10. Hairdressing	10,320	92.1%	31.5%
Total (all disciplines)	258,400	52.9%	33.2%



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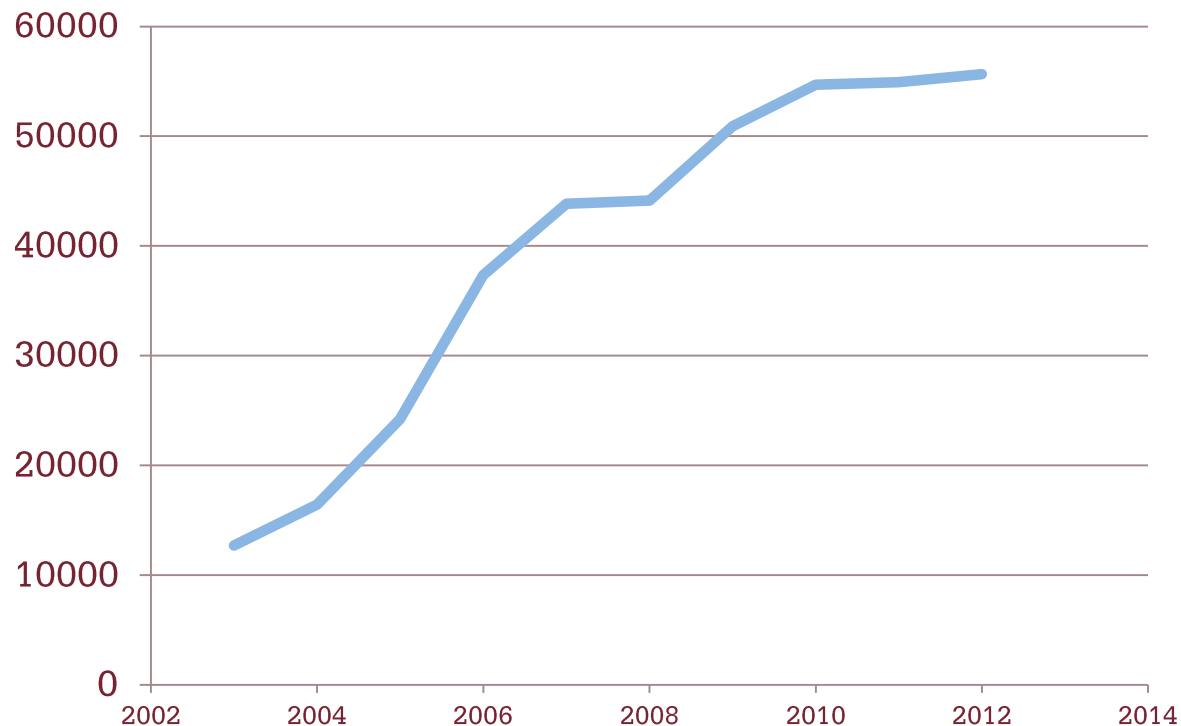


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CURRENT TRENDS APPRENTICESHIPS.

Growth in total engineering related since 2002



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THE PERKINS REVIEW.

22 recommendations

Government

Fund innovative proposals to develop skills

Encourage female A Level physics

Improve teacher recruitment

Review HE funding

Employers

Teacher and student experience of industry

Support the Teach Too scheme



Professor John Perkins' Review of Engineering Skills



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THE PERKINS REVIEW.

22 recommendations

Engineering Institutions

Support Tomorrow's Engineers

Input to curriculum content

Create cross-sector schemes to support research

Higher Education

Improve awareness of loan schemes

Diversity encouragement is a prerequisite for funding



Professor John Perkins' Review of Engineering Skills



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THE PERKINS REVIEW E4E RESPONSE.

- Facilitate industry experience for teachers (CPD) and work experience for students
- Get practicing engineers to teach in FE colleges
- Improve the awareness of engineering companies in HE



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SUMMARY FIRST IMPRESSIONS.



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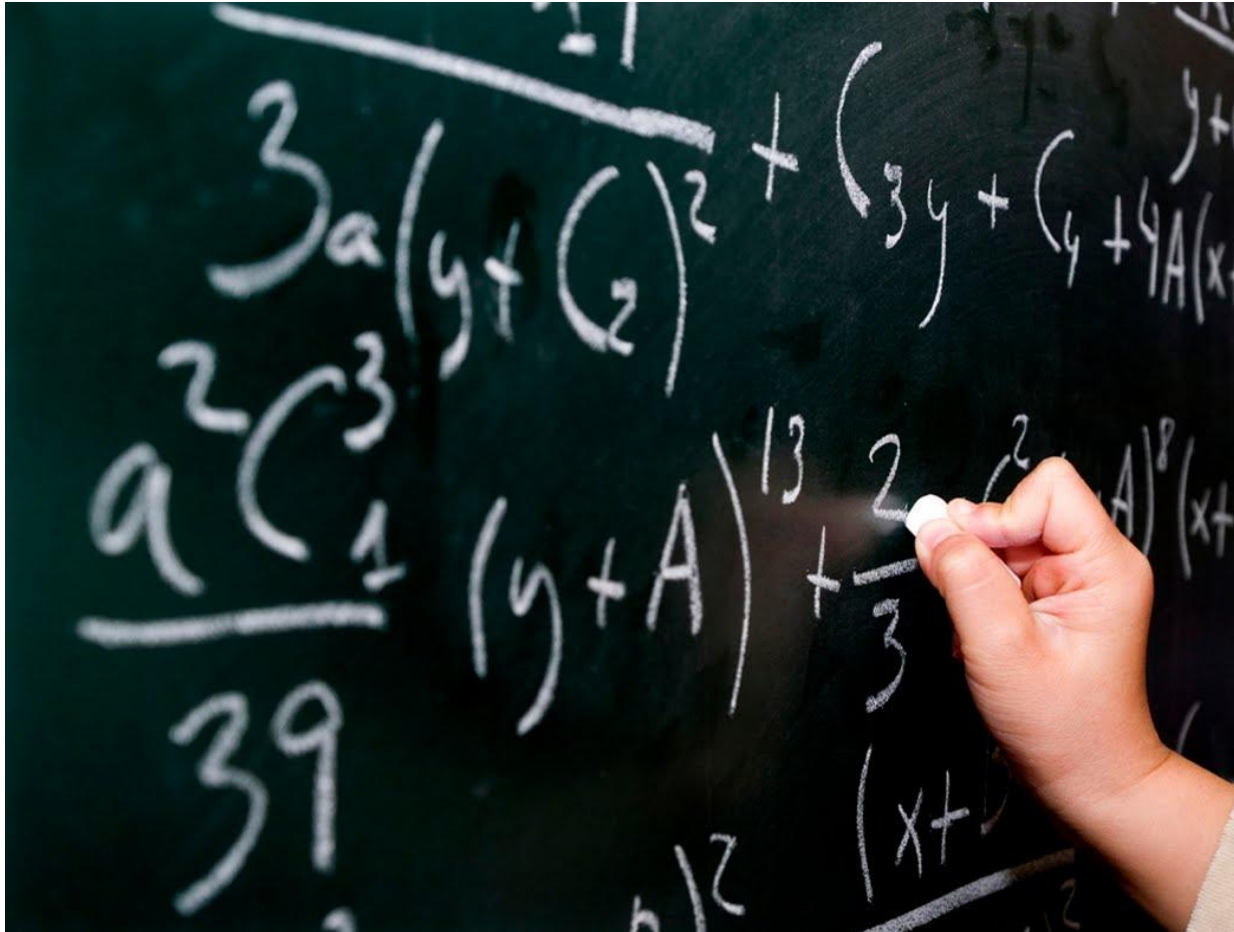
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SUMMARY UNDERSTANDING IS IMPROVING.



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SUMMARY PROGRESS IS BEING MADE.



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THANK YOU

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