



The Accreditation of Engineering Degrees in the UK
Richard Shearman

Engineering Council (UK)



- National Registration Body for Engineers and Engineering Technicians
- Sets standards of competence, education and professional development for engineers and technicians
- Licenses the Professional Engineering Institutions to register them
- Standards published in United Kingdom Standard for Professional Engineering Competence (UK-SPEC)

www.uk-spec.org.uk

Engineering Institutions



- 35 licensed by EC (UK) to register people
- 20 of these licensed to accredit academic programmes



Formation of Professional Engineers

- Two elements:
 - Education
 - Professional Development
- These may take place at same time
- Purpose is to develop Competence and Commitment
- Competence and Commitment assessed at Professional Review Examination
- Competence is technical and non-technical



Knowledge and Understanding

- You must have knowledge and understanding to be competent
- Knowledge and understanding come from education
- Academic qualifications indicate knowledge and understanding
- So there are exemplifying qualifications based upon professional accreditation



Educational Requirements

- For Chartered Engineer
 - Bachelors (Honours) degree plus Masters degree
 - **Or** integrated Masters degree (MEng)

- For Incorporated Engineer
 - Bachelors degree (non-Honours)



Accreditation by Professional Institutions

- Rules set by ECUK
- Has traditionally focused on inputs
 - Curriculum
 - Resources
 - Staff experience
 - Entry qualifications
- Accreditation now based on outcomes
- These are set out in UK-SPEC

Quality Assurance of Higher Education



- Quality Assurance Agency for Higher Education
- Carries out institutional reviews
- Based on universities' own QA processes
- Does not usually review subjects in depth
- National Qualifications Framework
 - describes Bachelors, Masters, etc degrees
- Different from professional accreditation



UK-SPEC General Learning Outcomes

- Knowledge and Understanding
 - Theories, concepts, principles
 - Science and mathematics
 - Wider context
- Intellectual Abilities
 - Quantitative analysis
 - Creative synthesis and design
- Practical Skills
 - Laboratory, workshop and site work
 - Group working and design projects
- General transferable skills
 - Problem solving, communication, team working, ICT
 - Planning own learning



UK-SPEC Specific Learning Outcomes (1) Science and Mathematics

- Principles and Methodology
- Necessary underpinning
- Minimal constraining core



UK-SPEC Specific Learning Outcomes (2) Engineering Analysis

- Application of principles
- Modelling
- Quantitative analysis
- Systems approach



UK-SPEC Specific Learning Outcomes

(3) Design

- Most important, integrates all knowledge and understanding
- Creativity and innovation
- Understand customer needs, cost issues etc
- Evaluate outcomes



UK-SPEC Specific Learning Outcomes (4) Social economic and environmental context

- Commercial factors
- Sustainable Development
- Risk assessment
- Ethics



UK-SPEC Specific Learning Outcomes (5) Engineering Practice

- Materials, processes etc
- Laboratory and workshop skills
- Technical literature, codes of practice
- Quality issues



MEng degrees

- Output statements have same headings
- Expectations are greater
- So more complex problems, independent learning
- Emphasis on unfamiliar contexts
- More innovative design work
- Ability to integrate knowledge and understanding

Incorporated Engineer degrees



- Similar headings covered
- Emphasis on understanding practice and processes
- Less focus on analysis



Important Points!

- Degree programmes are all different
- Weighting of different outcomes will be different too
- Accreditation must not stop innovation