Experiences from development and delivery of Work-Based Degree Programmes

Prof Malcolm Booth
Aston Professional Engineering Centre
Power Engineering FD - The Partnership

- SSE
- National Grid
- Other Employers

Company Selection Process

Student Pool

Foundation Degree

Aston University

Sterling Power Training

Industry Specialists

Other HEIs

Engineers
Engineering Gateways

Flexible Pathways to becoming a Professional Engineer
A work based route to meet the competence requirements for Chartered and Incorporated Engineer registration.

Engineering Gateways
Learning Whilst Earning

A route to professional qualification for working engineers without the full exemplifying qualifications who are unable to commit to full-time study. Employees are able to demonstrate the required competences for professional registration (UK-SPEC) at the same time as meeting the learning objectives for an academic qualification.

The framework for this route was developed as part of the government’s DIUS-funded ‘Gateways to the Professions’ initiative. ECUK led the work which also involved four universities, three PEIs and employer representatives.

A Learning Contract approach is used and successful completion leads to the award of an appropriate academic qualification and eligibility to apply for a Professional Review Interview with a participating Professional Engineering Institution.

This site provides information for working engineers interested in becoming professionally qualified, and is also relevant for some final year students who are unable to commit to further full-time study. The first participants are enrolled on the MSc Professional Engineering that opens a route to Chartered Engineer. A model is being developed for those seeking to become Incorporated Engineers.

An Interim Registration Protocol between ECUK and the Professional Engineering Institutions describes the process for the registration of candidates enrolled on the programmes. Interested PEIs are invited to contact ECUK.
Conformity to QAA-M level & UK-SPEC (*theory + practice*)

**QAA M-Level Descriptors**

**Knowledge**
- Systematic & Comprehensive Understanding
- Originality in application
- Conceptual & Critical Evaluation

**Skills**
- Operational
- Cognitive
- Transferrable

**Learning Contract**
- Work-Based Goals
- 180 Credits

**UK-SPEC**
- Engineering Knowledge
- Problem Solving
- Leadership
- Interpersonal Skills
- Professional Standards
A Convergence of Opportunities

MSc Professional Engineering (from Engineering Council Gateways Project)

BEng Professional Engineering

Aston Foundation Degrees Centre
BEng Professional Engineering (Power Systems)

- A two year programme.
- 120 level credits at level 6
- Work Based Blended Learning.
  - Distance learning material on Blackboard
  - Some work based projects
  - Some mentoring.
- 6 modules
The Modules

- Professional Development Audit
  - 10 credits

- Sustainable & Renewable Technologies
  - 20 credits

- Elements of Power Systems 1
  - 20 credits

- Elements of Power System II
  - 20 credits

- Power Electronics & M/Cs for Power Systems
  - 20 credits

- Work Based Project
  - 30 credits
The reference points used to inform programme learning outcomes are set against the following:

| Benchmark Statement of the IET/IMechE IEng class of membership |
| Benchmark Statement of UK-SPEC Engineering Specific Learning Outcomes. |
| Engineering Council Guide to BEng Professional Engineering. & QAA Engineering Benchmark |
BEng Professional Engineering (new in 2014)

- Has been approved for delivery in 2014
- A generic framework which will allow for discipline specific electives.
- Based on our experience of running the BEng Professional Engineering (Power Systems).
- Two or three year duration.
- Elective modules of either 10 or 20 credits
The New Module Structure

- Professional Development
  - Audit
  - 10 credits

- Project Management
  - 20 credits

- Three or more elective modules totalling 60 credits

- Work Based Project
  - 30 credits
Current Set of BEng Elective Modules

- Offshore Engineering for Oil and Gas
- Microcontrollers: Architecture & Programming
- Power Systems 1.
- Health, Safety & Environment
- Electrical Machines Construction & Performance
- Engineering Materials 1
- Solid Mechanics
- Process & Pollution Control
- Process Control & Instrumentation
- Electronic Group Design Project
- Quality Engineering
B Eng Professional Engineering Delivery Issues

- Learning methodology
  - Distance learning
  - Work-based components
- Student support
  - Workplace mentors
  - Professional Supervisors
  - Academic Supervisors
- University experience
  - Affiliation with the university
  - Access to student services/facilities
The Development Triangle

- Academic AND Professional progression
- Level 2 to Level 8
- Lifelong learning
- Progression routes - recognised entry and exit points
- Evolution of learning styles
- Academic Qualification + ...........
- Professional Engineering Registration
Professional Practice Experience of Application: Theoretical Understanding WBL Traditional Undergraduate Provision The Engineering Professional
Our Partners – some!
Candidates who wish to take Work Based Blended learning programmes should have:

**Motivation & time management**
- Self motivation
- Good time management

**Discipline**
- Self discipline
- Capability to read for comprehension

**Objectives focus**
- Ability to set sights on an end result
- Confident in being academically able
Work Based Blended Learning Success Criteria

**Ability & Responsibility**
- Ability to overcome obstacles and not to give up easily
- Responsibility of one’s own education – what one’s learning is ultimately his own responsibility

**Desire**
- Willingness to try something new
- Willingness to work in a non-structured environment

**Express opinion & engagement**
- Willingness to express opinion in writing
- Willingness to actively participate in the learning process by doing tasks, projects, etc.
Present Portfolio & Student Success

- Foundation Degree in Electrical Power Engineering - 500+ graduates, 20% at Distinction Level
- Foundation Degree in Gas Transmission Engineering - 30+ Graduates, 35% at Distinction level
- Foundation Degree in Logistics - 100+ Graduates, 30% at Distinction level
- B.Eng in Professional Engineering (Power Systems) - 35+ Graduates, 50% at First Class Honours
- MSc in Professional Engineering - 3 Graduates
Aston’s commitment to Professional Engineering and work-based learning

- Establish employer-led teaching programmes
- Power Engineering Foundation Degree Pathways
- Build on strong industrial links
- Gas Engineering and Logistics Foundation Degrees
- M Sc in Professional Engineering
- B Eng Professional Engineering (Power Systems)
- B Sc Logistics Progression Programme
Company benefits

- Strengthened ‘talent pipeline’ for senior operational staff
- More professional staff who are able to cope with change
- Give staff the knowledge and confidence to compete commercially with other companies
- Operational staff who have a demonstrated ability to learn and apply learning in current and future roles
- Operational staff who have a broader understanding of ‘logistics’ as a profession and can use tools and techniques in workplace
- More structured and logical approach in which to review, evaluate and make decisions
- Staff who are skilled and confident and more open to opportunities outside their own work environment
- Business benefits from work-based project outputs
Learning Points

- There is a specific demand for these types of programmes.
- They are difficult to do properly.
- They don’t fit well within a normal university organisational structure using existing systems.
Thank you

Any Questions?

m.booth@aston.ac.uk