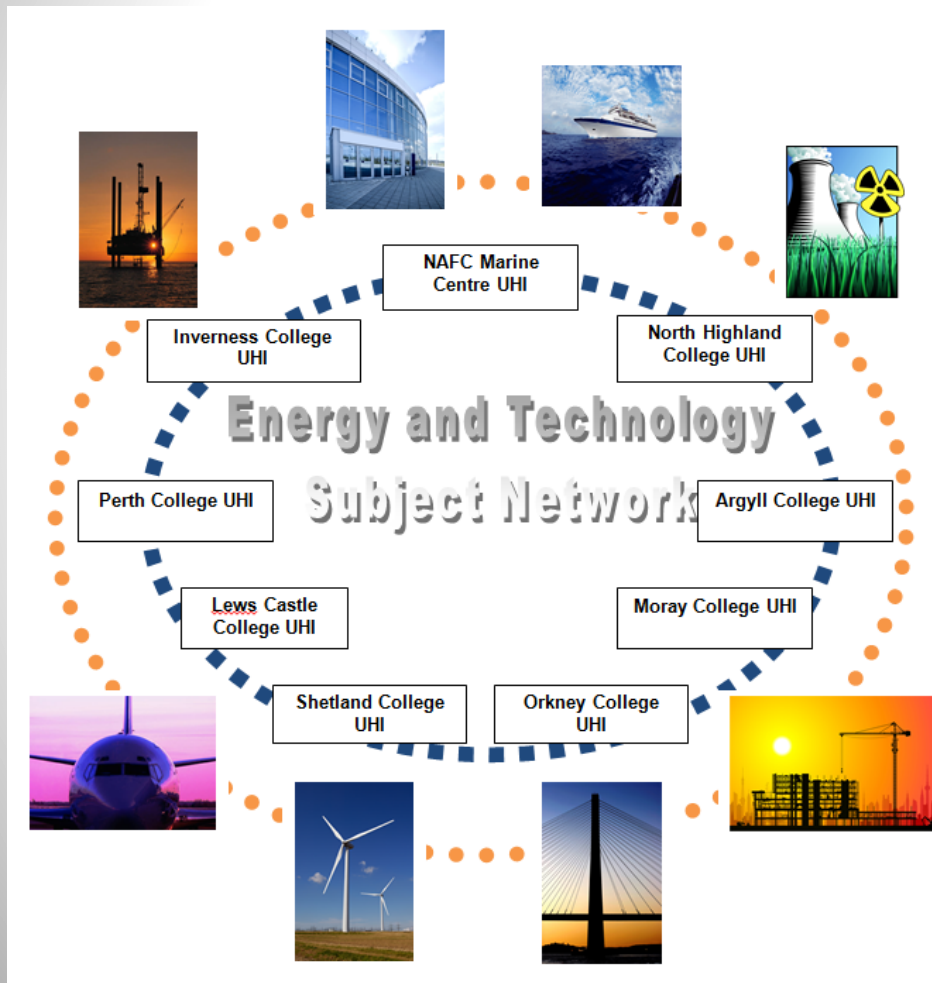


Electrical Power Engineering Foundation Degree



University of the Highlands and Islands



UHI Inverness College

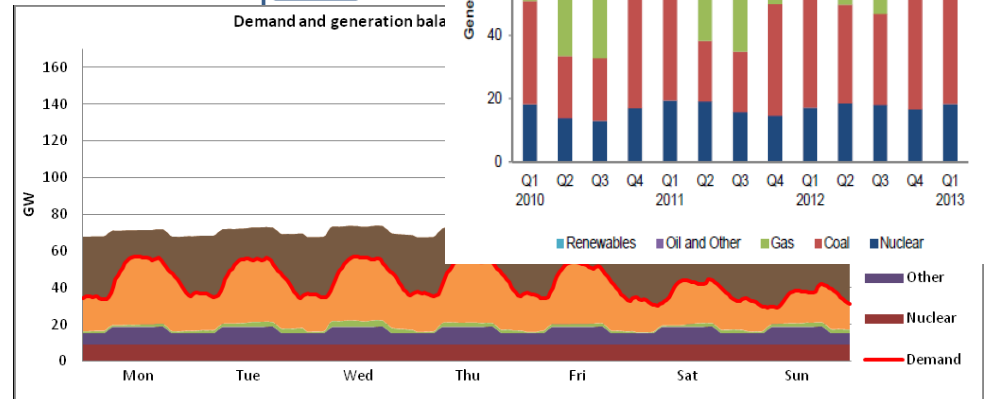
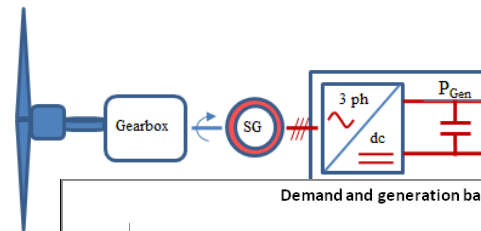


Scottish School of Forestry, and also offers courses in: arts; social sciences; history; health and care; electrical and mechanical **engineering**; business and management; construction; sports; beauty therapy and science.



Why is the programme required?

- Targets to transform the UK into a low carbon economy and meet a 15% renewable energy target by 2020 and our 80% carbon reduction target by 2050.
- Aging grid network requiring substantial replacement/upgrading.
- New technologies available for power transmission and management
- Shortfall in power engineers
- Demographics – high number of power engineers approaching retirement.
- New demands on the system – embedded generation, electric vehicles, heat pumps etc.
- Most institutions dropped power engineering in the 80's



Course Requirements



Energy Companies (SSE, National Grid, Eon etc.) requested a suitable engineer training programme:

- Degree must provide the underpinning knowledge for current industry practices taught by Lecturers with power industry experience.
- Maximum two years academic study, three years to competency
- Must allow on-the-job training during study – block release
- Must satisfy professional body requirements for Incorporated Engineer

Course content must include:

- Electrical power engineering principles
- Mechanical engineering principles
- Civil engineering
- Project management
- Business skills – managing people, budgets and systems.

University partner(s) requirements:

- Track record in electrical power engineering
- Electrical power engineering equipment
- Lecturers with power engineering experience
- Access to the programme for students in remote parts of the UK.



Student Experience

Students must have:

- 3 Highers (2 A levels) – Maths, Physics + 1 other relevant higher or equivalent.
- 80% are aged 17 to 20; 20% aged 20 to 35.
- Recruited by SSE (must be employed)

Benefits

- Employed and paid during training (~£16k)
- All course fees, travel and subsistence paid
- Comprehensive work-based programme
- Job guarantee as Technical Engineer
- Progression to BEng/MEng available

Qualification Levels

- ▶ All UK qualifications mapped against a credit framework
- ▶ Foundation Degree, level 4/5 (England) and Level 7/8 (Scotland)

Euro EQF	England QCF	Scotland SCQF	Typical Qualifications
8	8	12	Doctorate, PhD
7	7	11	Masters Degree - MSc, MA, SVQ Level 5, CEng
6	6	10	Honours Degree, BEng Hons etc.
		9	Ordinary Degree, BA, BSc, BEng IEng
5	5	8	Foundation Degree Yr 2 HND, SVQ L4
	4	7	Foundation Degree Yr 1 HNC, SVQ L3
4	3	6	Highers, National Certificate
3	2	5	Standard Grade, National Certificate

Programme Outline

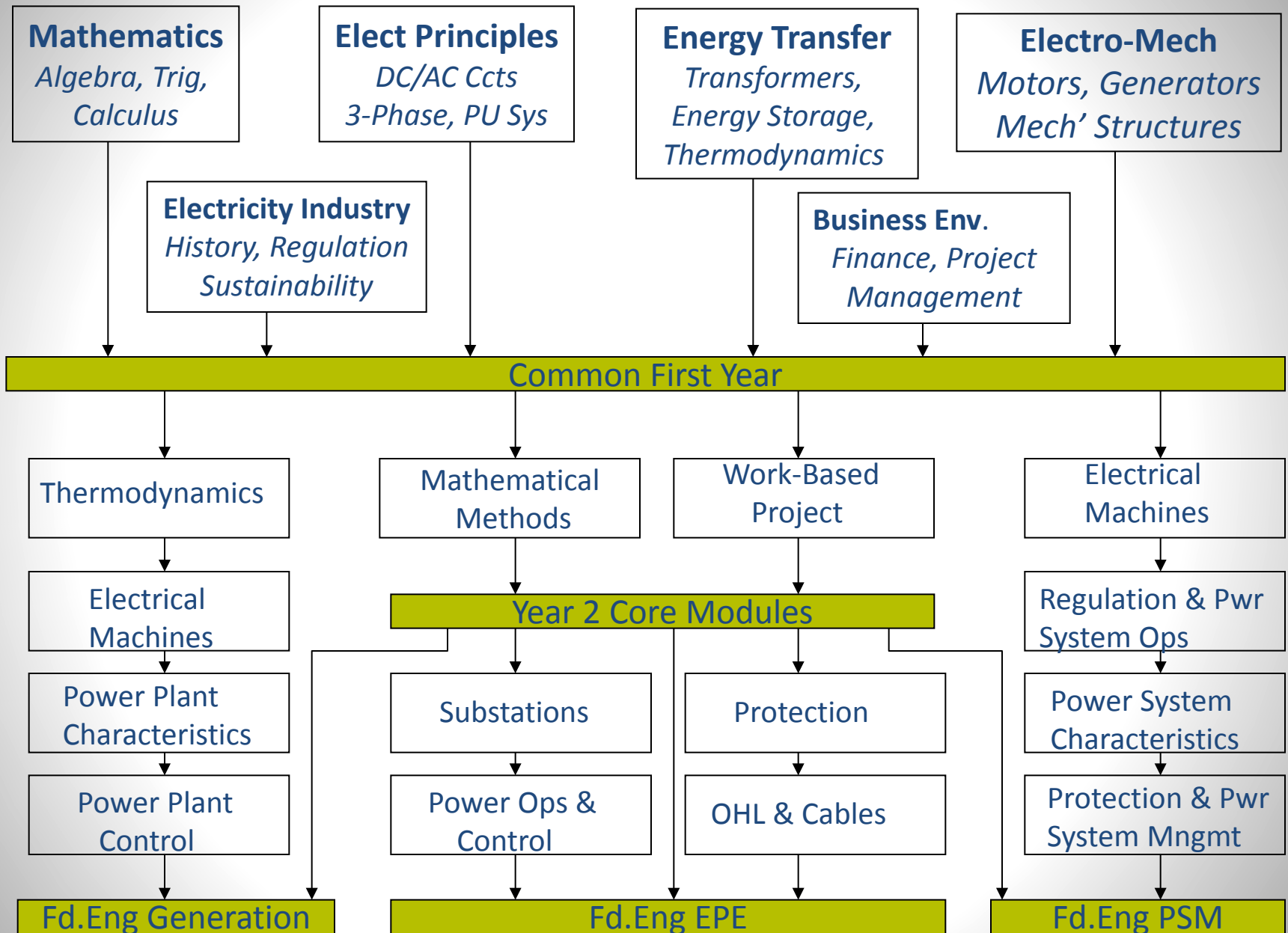
- Programme consists of 240 Credits:
 - 6 x 20 Credit Year 1 Modules at QCF level 4 (SCQF 7)
 - 6 x 20 Credit Year 2 Module at QCF level 5 (SCQF 8)
- Typically two weeks residential per module
 - 20 credits = 200 guided learning hours
 - Approx 72 hours directed learning/practicals/tutorials etc
 - Approx 128 hours self-study
- *Expect to spend 12 to 14 hrs of self-study between blocks.*

Programme Assessment

- Assessment is a combination of Assignments, Projects and Exams
- Typical module is 25% Assignment and 75% Exam
 - Minimum of 30% per component and 40% combined marks for a pass
- Grades:
 - Pass (40%),
 - Merit (60%) and
 - Distinction (70%).



Electrical Power Engineering Foundation Degrees



Professional Recognition




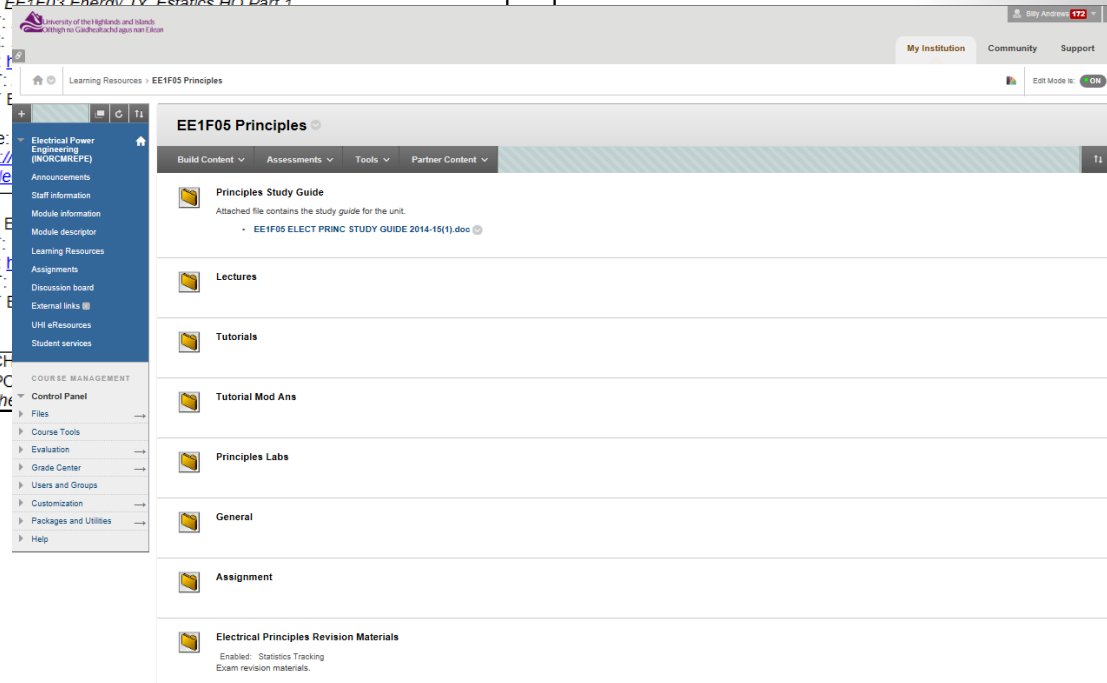
- Electrical Engineers are accredited by the Engineering Council to:
 - Incorporated Engineer, IEng, or
 - Chartered Engineer, CEng
- Awarded by the Institution of Electrical Technology, IET
- Engineers must have:
 - A recognised academic qualification e.g. Foundation Degree for IEng
 - Relevant professional experience e.g. TST programme for IEng.

Delivery Modes

Student centred using a blended learning approach:

- *Constructivism approach via Laboratory Assignments, Technical Articles, Demonstrations, PBL tools, Set Book Exercises, YouTube, VLE etc. relating to real-world problems.*
- *Flop classroom/Problem Based Learning methodologies based on VLE used.*

Session 3hr	Learning Outcomes	Learning Activities	✓
Induction to unit: <i>introduction, expectations, delivery mode, learning tools</i>			
1	Overview of unit, expectations, resource requirements. Teaching/learning strategy, on-line tools Learning and assessment plan/schedule.	Access to Blackboard VLE HO: <i>EPE ENERGY TX DELIVERY PLAN 2014</i> HO: <i>EE1F03 Energy Transfer Descriptor</i>	
Outcome 1: <i>Perform calculations on electrostatic circuits.</i>			
1, Wed am	a) Introduction to electric fields	LEC: <i>Electro-statics and Transmission Lines</i> HO: <i>EE1F03 Energy Tx, Estatics HO Part 1</i>	
1, Wed am	b) Magnitude of forces and couples on current carrying conductors due to electric fields Charge, Electric field strength, Equipotential lines, Coulomb's law	PPT:  VLE: VID: TUT: SET E	
1, Wed am	c) Capacitance of discrete systems; Flux density, Capacitance and Capacitors		
2, Wed pm	d) Energy stored in electric fields; energy transfer; force of attraction and alignment; Energy and power flows; dielectric loss; loss angle, calculations of force, dielectrics	Note: http://g=ele	
2, Wed pm	e) Effect on a material when an electric field is applied across it.	HO: E PPT: VID: I TUT: SET E	
2, Wed pm	f) The 3 primary contributions to the dielectric constant.		
3, Thu am	g) Speed of dielectric response		
3, Thu am	h) Dielectric breakdown mechanisms; Breakdown strength improvement		
3, Thu am	i) HV Cable insulation tan-delta testing, dielectric loss; loss angle.	TECH REPC on the	



Company support

- Excellent level of company commitment
- Personal Mentors
- Subject tutors – year 2 project
- Informal support – workplace colleagues, Foundation Degree Graduates and not least each other



Foundation Degree In Electrical Power Engineering

- First graduate cohort of 12 in June 2008
- 35 graduates in two cohorts – Aston and Inverness this year.
- 40 required next year.
- Almost 500 graduates to date, approximately 25% graduating with distinction
- B.Eng and M.Sc. Progression paths available.

Any Questions?