



Course Outline (Higher Education)

Institute / School:	Institute of Innovation, Science, and Sustainability
Course Title:	POWER SYSTEM PROTECTION
Course ID:	ENGIN3103
Credit Points:	15.00
Prerequisite(s):	ENGIN2104 or ENGIN2404
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	031301

Description of the Course:

This course extends learning of power system analysis to provide in-depth knowledge and understanding of power system protection. You will be introduced to instrument transformers, fundamentals of relaying, overcurrent protection and coordination, directional overcurrent protection, differential protection, distance protection, and distributed generation protection. You will be further introduced to the development and challenges in the field of power system protection by linking theory to real industry examples.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes:

Knowledge:

- K1.** Demonstrate and justify the choice, application, and operation of different protection devices for fulfilling power system protection under different operating conditions.
- K2.** Recognise the requirement of various protection schemes for the proper operation of the power system.
- K3.** Identify different protection devices and their impact on protection scheme performance.

Skills:

- S1.** Synthesize different (overcurrent, directional overcurrent, differential, distance) protection systems.
- S2.** Evaluate performance of different protection systems.
- S3.** Estimate key parameters that influence the design of typical protection systems.

Application of knowledge and skills:

- A1.** Interpret power system faults for balanced and unbalanced conditions.
- A2.** Apply the fundamental principles of power system protective devices for various applications.
- A3.** Investigate different challenges associated with power system protection.

Course Content:

Topics may include:

- Fundamental protection concepts and protection schemes for various power system configurations
- Fault current calculations
- Protection devices
- Instrument transformers (CTs and VTs)
- Distance protection, protection signalling
- Protection of generators, transformers, transmission lines, busbars, feeders.
- Development and challenges in the field of power system protection

Values:

- V1.** Appreciate learning as a lifelong process and the importance of protection in power systems.
- V2.** Appreciate and apply safe practices in an environment that may contain potential electrical hazards and current challenges and development in power system protection.

Graduate Attributes

The Federation University Federation graduate attributes (GA) are entrenched in the [Higher Education Graduate Attributes Policy](#) (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor	Development and acquisition of GAs in the course	
	Learning Outcomes (KSA)	Assessment task (AT#)

Graduate attribute and descriptor		Development and acquisition of GAs in the course	
		Learning Outcomes (KSA)	Assessment task (AT#)
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K1-K3, S1-S3	1,2,3
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	K1, S1, A1-A3	1,2,3
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	S2, A1-A3	1,2,3
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	K1-K3, A1, A3	1,2,3
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	S2, S3, A1-A3	1,2,3

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1, K2; S1-S3, A2, A3	Relevant tasks and problems to enforce understanding of the students and help in the gradual development of knowledge and skills throughout the course Projects to verify students' ability to apply knowledge and skills acquired in the course.	Quizzes/Assignments/Team Project/Project Report/Presentation/Workshop	20% - 30%
K3, A1, A2	Questions and problems related to the materials covered in the course.	Online Quiz/Mid-semester Test/ Class Test	20% - 40%
S3, A1, A3	Conceptual questions and numerical problems related to the materials covered in the course.	End of Semester Final Test	30% - 50%

Adopted Reference Style:

Other (IEEE)

 Refer to the [library website](#) for more information

 Fed Cite - [referencing tool](#)