



Course Outline (Higher Education)

Institute / School:	Institute of Innovation, Science, and Sustainability
Course Title:	ELECTRICAL DEMAND FORECASTING AND MANAGEMENT
Course ID:	ENGIN5103
Credit Points:	15.00
Prerequisite(s):	(ENGIN3102)
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	031301

Description of the Course:

This course provides in-depth knowledge and understanding of electrical demand forecasting and management, which includes an overview of demand flexibility and different short and long-term forecasting models. You will be exposed to various prediction tools for aggregated response and the applicability of intelligent forecasting models.

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"/>				
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>				
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes:

Knowledge:

- K1.** Recognize the key components in static and dynamic forecasting models and appraise the difference between them.
- K2.** Differentiate between various state estimation techniques for demand forecasting.
- K3.** Identify appropriate tools for demand management and aggregated response.

Skills:

- S1.** Synthesize load forecasting models for both static and dynamic states with given specifications and performance parameters.
- S2.** Appraise innovative forecasting models using different AI and machine learning methodologies.
- S3.** Evaluate and assess solutions to challenges associated with electrical demand forecasting and management.

Application of knowledge and skills:

- A1.** Apply industry-standard software analysis tools to simulate and study electrical demand and load forecasting.
- A2.** Interpret results from different predictive tools applied to electrical demand forecasting and management.
- A3.** Investigate the behavioural changes to load and demand in devising predictive and management models.

Course Content:

Topics may include:

- Overview of demand flexibility
- Static and dynamic state estimation
- Short and long term forecasting models
- Machine learning and AI in generating forecasting models
- Prediction tools for aggregated response
- Tools for customer side load and battery management
- Options for automated response, market based vs sign-up contract
- Exposure of customer willingness, utility command and decay of manual response

Values:

- V1.** Appreciate and apply safe practices in an environment that may contain potential electrical hazards along with the applicable standards and grid codes.
- V2.** Appreciate learning as a lifelong process and the importance of the prediction and management of demand and load forecasting in electrical power systems.

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#)
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, K2, K3, S1, S2, S3, A1, A2, A3	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, K3, S1, S2, S3, A2	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.	K1, K2, S3, 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.	K3, S3, A1	1,2
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.	K1, K2, S1, S3, A3	1,2,3

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1, K2, 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. Questions and problems related to the materials covered in the course.	Quizzes/Online Test/Assignments	20% - 30%
S3, A1, A3	Relevant tasks and problems to enforce understanding of the students and help in the gradual development of knowledge and skills throughout the course.	Workshop/Lab Report/Presentation	20% - 40%
K3, S1, S2, A1, A2	Projects to verify students' ability to apply knowledge and skills acquired in the course.	Project Report/Workshop/Presentation	30% - 50%

Adopted Reference Style:

Other (IEEE)

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

Fed Cite - [referencing tool](#)