Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	ELECTRICAL DEMAND, FORECASTING AND MANAGEMENT
Unit ID:	ENGPG9205
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	(ENGRG9202)
ASCED:	031301

Description of the Unit:

This unit 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. Students 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)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	**6**	**7**	**8**	**9**	**10**
Introductory						
Intermediate						
Advanced					✔	

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 mangagement.

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.

Unit 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

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment 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 unit. Questions and problems related to the materials covered in the unit.	Quizzes	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 unit.	Mid-semester Exam	20% - 40%

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K3, S1, S2, A1, A2	Projects to verify students` ability to apply knowledge and skills acquired in the unit.	Team project and presentation	30% - 50%

Adopted Reference Style:

IEEE

Refer to the library website for more information

Fed Cite - referencing tool