

Course Outline (Higher Education)

Institute / School:	Institute of Innovation, Science and Sustainability
Course Title:	FOUNDATIONS OF ELECTRICAL AND ELECTRONIC ENGINEERING
Course ID:	ENGIN1007
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	031301

Description of the Course:

The aim of this course is to introduce electrical circuits and the relevant analysis techniques. This course covers fundamental concepts and knowledge including electrons, charges, currents, voltages, power, resistors, inductors, capacitors, Kirchhoff's laws, Thevenin Theorem, Mesh analysis, transient responses of RLC circuits, phasors analysis, etc. It is about "circuit analysis" from an engineering perspective as well as developing basic problem-solving skills as they apply to situations an engineer is likely to encounter

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

Work Experience:

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

Does Recognition of Prior Learning apply to this course? No

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"/>
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 type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes:

Knowledge:

- K1.** Demonstrate a comprehensive understanding of basic concepts in electrical and electronic engineering
- K2.** Recognise the steady-state and dynamic characteristics of different electric components and electric circuits
- K3.** Comprehend the principles of different circuit analysis methods

Skills:

- S1.** Design and construct DC and AC circuits using various electric components
- S2.** Analyse electric circuits by using different analysis techniques and theorem
- S3.** Assess the voltage, current and power of an electric system under different conditions

Application of knowledge and skills:

- A1.** Apply circuit analysis technologies to investigate the behaviours of a given circuit
- A2.** Investigate response of a given circuit topology based on numerical simulation
- A3.** Solve practical problems through experimental tests

Course Content:

Topics may include:

- Introduction to concepts of charges, currents, voltages, power and energy
- Introduction to basic electric components such as resistors, inductors, capacitors, dependent/independent voltage and current sources, etc.
- Electric circuit connection and analysis techniques such as Kirchhoff's laws, Thevenin Theorem, Norton Theorem, and Mesh analysis
- Transient responses of RLC circuits, steady-state response of circuits to sinusoidal excitation in time domain
- Application of phasors to circuit analysis
- AC circuit power analysis

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-K3, S1-S3, A1-A3	AT1-AT3
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.	Not applicable	Not applicable
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, S3	AT2
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.	S2, S3, A1	AT1-AT2
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.	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K3, S1-S3, A2, A3	A range of laboratory and associated reports	Lab Report	20% - 30%
K1-K3, S1-S3, A1	Small quizzes undertaken to support the theoretical development during lectures.	Quizzes	20% - 40%
K1-K3, S1-S3, A1	An examination on any or all material covered in the course	Examination/test	40% - 50%

Alignment to the Minimum Co-Operative Standards (MiCS)

The Minimum Co-Operative Standards (MiCS) are an integral part of the Co-Operative University Model. Seven criteria inform the MiCS alignment at a program level. Although courses must undertake MiCS mapping, there is NO expectation that courses will meet all seven criteria. The criteria are as follows:

1. Co-design with industry and students
2. Co-develop with industry and students
3. Co-deliver with industry
4. FedTASK alignment
5. Workplace learning and career preparation
6. Authentic assessment
7. Industry-link/Industry facing experience

MiCS program level reporting highlights how each program embraces the principals and practices associated with the Co-Operative Model. Evidence of program alignment with the MiCS, can be captured in the Program Modification Form.

MICS Mapping has been undertaken for this course No

Date:

Adopted Reference Style:

IEEE

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

Fed Cite - [referencing tool](#)