

# ENGR 1050 SUSTAINABLE ENGINEERING FUNDAMENTALS

**Credit Points** 10

**Legacy Code** 301418

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**Description** Engineers need to ensure that their practice is guided by sustainability principles. This subject will introduce students to sustainability and provide an understanding of the environmental and social impacts of human development. Students will be introduced to various national and international initiatives including the United Nations Sustainable Development Goals. Students will learn fundamental scientific concepts in chemistry and ecology, and conduct and report on laboratory experiments relevant for emerging issues. Students will apply concepts such as material and energy flow, limiting nutrients, carrying capacity, climax, biodiversity, food chain and irreversibility in relation to how an ecosystem responds to changes in the environment to real world case studies.

**School** Eng, Design & Built Env

**Discipline** Engineering and Related Technologies, Not Elsewhere Classified.

**Student Contribution Band** HECS Band 2 10cp

Check your fees via the Fees ([https://www.westernsydney.edu.au/currentstudents/current\\_students/fees/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**Level** Undergraduate Level 1 subject

## Learning Outcomes

On successful completion of this subject, students should be able to:

1. Explain the need for sustainable development and key national and international initiatives.
2. Explain the concepts of ecology.
3. Apply the concepts of ecology to evaluate the effects of human activities on ecosystem.
4. Identify the concept of chemical equilibrium used to evaluate phenomena related to chemical reactions including acids and bases.
5. Apply concepts of oxidation and reduction to analyse electrochemical cells and corrosion.
6. Communicate concepts, experiments and results in a clear and ethical manner.
7. Work safely and collaboratively in groups on laboratory experiments and projects, contributing to reports.

## Subject Content

- 1.Introduction to sustainability
- 2.Ecology and ecosystems
- 3.Effects of economic development on environment and society
- 4.Key international and national initiatives on sustainable development
- 5.Stoichiometry
- 6.Chemical equilibrium
- 7.Acids and bases

8.Electrochemistry

9.Chemical reaction kinetics

## Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/Group Task
Self-Assessment	30 minutes (each week)	20	N	Individual
Practical	500-1000 words	20	N	Both (Individual & Group)
Short Answer	45 minutes (per Quiz)	30	N	Individual
Report	2000-3000 words and 15 minutes	30	N	Both (Individual & Group)

Prescribed Texts

- Brown, TL., LeMay, HE, Bursten, BE, Murphy, CJ, Woodward, PM, Stoltzfus, M 2018, Chemistry: the central science, 14th edn, Pearson, Boston. <https://west-sydney-primo.hosted.exlibrisgroup.com/permalink/f/1vt0uuc/UWS-ALMA21196197280001571>