ENGR 7020 SUSTAINABILITY AND RISK ENGINEERING (PG)

Credit Points 10

Legacy Code 300939

Coordinator Dharma Hagare (https://directory.westernsydney.edu.au/search/name/Dharma Hagare/)

Description Analysis of sustainability with engineering perspective is increasingly becoming important in the modern world. Also, in the future sustainability will include risk engineering. Hence, engineers with in-depth understanding of different tools that can be used for both sustainability and risk analysis will have significant competitive edge in their future career. The main objective of this subject is to introduce different tools available for sustainability and risk analysis in various engineering applications. The content includes renewable/alternative energy systems, energy/resource efficiency, sustainable/green buildings, sustainable transport and infrastructure, sustainable water management, environmental management systems, sustainability reporting, life cycle analysis, probability/reliability theory, risk assessment models, overall system analysis.

School Eng, Design & Built Env

Discipline Other Engineering And Related Technologies

Student Contribution Band HECS Band 2 10cp

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Postgraduate Coursework Level 7 subject

Restrictions

Students must be enrolled in a postgraduate program

Assumed Knowledge

Engineering problem solving skills.

Learning Outcomes

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

1. Apply engineering knowledge for comprehensive analysis of engineering systems for sustainability.
2. Choose appropriate tools/methods for sustainability and risk analysis of engineering systems.
3. Conduct thorough energy/water/materials audit for a given engineering system and construct detailed mass balance tables.
4. Determine appropriate water, energy, transport and infrastructure system based on sustainability and risk management criteria.
5. Carry - out triple bottom line based life cycle analysis of engineering systems including rigorous economic analysis tools.
6. Conduct overall system analysis of engineering systems considering sustainability and risk criteria.

Subject Content

mass balance/ flow analysis
heat/energy flow/conservation/loss analysis
renewable/ alternative energy systems
energy/resource efficiency
sustainable/green buildings
sustainable transport and infrastructure
sustainable water management
environmental management systems
sustainability reporting/ framework
life cycle analysis
probability/ reliability theory
risk assessment models
integrated system analysis.

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
Quiz	1 hour per quiz	20	N	Individual
Report	5,000 words including tables, figures and pictures	25	N	Group
Practical	1,000 words including tables, figures and pictures.	5	N	Group
Final Exam	3 hours	50	N	Individual

Prescribed Texts

- Vezzoli, C. and Manzini, E. (2008). Design for environmental sustainability. Springer, London.
- Wang J.X. and Roush M.L. (2000). "What every engineer should know about risk engineering and management ", New York : Marcel Dekker, Inc.
- White, I. (2010). Water and the city: risk, resilience, and planning for a sustainable future, Routledge, New YorK.
- Yigitcanlar, T. (2010). Rethinking sustainable development: urban management, engineering, and design, Engineering Science Reference, Hershey, Pa.

Teaching Periods

Spring (2023)

Parramatta City - Macquarie St

On-site

Subject Contact Dharma Hagare (https://directory.westernsydney.edu.au/search/name/Dharma Hagare/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ENGR7020_23-SPR_PC_1#subjects)

Spring (2024)

Parramatta City - Macquarie St

On-site

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View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ENGR7020_24-SPR_PC_1#subjects)