Seoul National University of
Science & Technology
232 Gongneung-ro,Nowon-gu,
Seoul 01811 Korea

MSDE Module Descriptor

Module Title **Sustainable Engineering**	**Module Code** **MSDE 424**	**Semester** **(Sem 2)**
Credits **10**	**Level** **6**	**Professor and email** **Anthony Johnson** **a.d.johnson@seoultech.ac.kr**
Delivery Method **Lecture / Lab / Project**	**Delivery Location** **Mugung Hall** **Seoultech**	

Module Synopsis

This module provides students with the knowledge and understanding to integrate sustainable development and environmentally conscious designs into the engineering cycle. The schedule includes the role of the designer in the reduction of environmental impact using the vehicle of design: recycling, component re-use sustainable materials selection the manufacturing and remanufacturing (deconstruction and refurbishment), life-cycle considerations, analyses, trade-offs, appropriate standards e.g. ISO14001 and ISO14044.

Outline Syllabus

1. sustainable development
2. environmental impact from engineering products and processes
3. Life Cycle Analysis (LCA)
4. life cycle design
5. design influence, methods on the product life-cycle including measurements (Embodied Energy)
6. sustainable manufacturing (smart factories)
7. the importance of maintenance and refurbishment within the product life cycle
8. usage, reuse, remanufacturing and recycling within the product life cycle
9. environmental management standards: ISO14001, ISO14044

Indicative Reading

a. "Sustainability in Engineering Design": 2014:Anthony Johnson and Andrew Gibson: publisher: Elsevier: ISBN978-0-08-099369-0
b. Sustainability; Its Incorporation into the Engineering Design Process: 2016: Anthony Johnson Lambert:ISBN:978-3-659-94253-2
c. "Green Products by Design: Choices for a Cleaner Environment", US Congress Office of Technology Assessment, OTA-E-541. Pub: US printing office, Washington, DC, October 92
d. "Environmentally Benign Manufacturing", International Technology Research Institute, world technology (WTEC) division, panel report, April 2001

Assessments	Assessment Type	Weighting %	Mid-Term/interim/final
Coursework			
Project			
Quiz			
Test	Report/pres	40%	Mid Sessional
Laboratory			
Exam	Final report/pres	60%	Final
Presentation			

NOTIONAL STUDENT WORKLOAD (Hours)	Hours
MODE OF DELIVERY (FT / PT / DL	FT
Lectures	40
Seminars	5
Tutorials	
Laboratories/studios/practical	
Directed learning	10
Independent Learning	40
Work experience/fieldwork	
Other: eg formal presentation	5
Total Workload 100 hours for a 10 credit module 200 hours for a 20 credit module	100

Module Learning Outcomes	
KU 2	Perform comprehensive analysis of engineering systems.
IPSA 1,3	Apply a range of appropriate approaches to solving defined real world engineering problems. Derive solutions to complex health and safety, sustainability and environmental issues in the engineering sector.
PVA 1,2	Critically analyse advanced solutions to complex engineering problems Apply creativity in the development of solutions to standard engineering problems

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