



Technology, Society, and Sustainability

Prof. John Yee, SKKU

SHORT COURSE DESCRIPTION

Traditionally, industries have pursued smarter, faster, cheaper, and more productive performance rather than sustainability. This course will discuss about how the technology and society have changed and affected each other. Furthermore, with the lightning speed of technological evolution we will cover how we could run our technology and society with sustainability. Close collaborations between business sectors, OEMs, and suppliers could accelerate towards sustainable future. Industrial Ecology (IE) is an interdisciplinary field that focuses on the sustainable collaboration between environment, economy, and technology. The central idea is the analogy between natural and socio-technical systems. The word 'industrial' does not only refer to industrial complexes, but also more generally to how humans use natural resources in the design and production of goods and services. Ecology refers to the concept that our industrial systems should incorporate principles exhibited within natural ecosystems. Industrial ecology proposes not to see industrial systems (for example, a factory, an eco-region, or national/global economy) as being separated from the biosphere, but to consider it as part of an ecosystem based on infrastructural capital rather than on natural capital. As natural systems do not have waste in them, we should model our systems after natural ones to make them sustainable and to bring prosperity in our surrounding environments.

READING MATERIALS

Reading materials will be provided in advance during the course. All the lecture notes and other course materials will be provided in the class. Background readings include:

1. Industrial Ecology: An Introduction, Andy Garner and Gregory A. Keoleian (1995).
2. Sustainability Primer, EPA (2018).
3. GSA Sustainable Facilities Tool – explore “Learn”, “Plan”, “Explore”, “Procure” submenus, *sftool.gov* (2018).
4. *Technology and Society – Impact of technology on society*, Karehka Ramey (2012).
5. Types of Impacts of Technology, United Nations Environment Programme, Division of Technology, Industry, and Economics
<http://www.unep.or.jp/ietc/Publications/Integrative/EnTA/AEET/6.asp> (2018).

COURSE REQUIREMENTS AND GRADING

Attendance and active participation in class is very important for the completion of the course. Open discussions are encouraged and will be arranged on suitable topics. Academic dishonesty, plagiarism, poor team work, and less than 80% attendance (without prior information and professor's consent) leads a student to fail.

CRITERIA	ATTENDANCE	EXCURSION	CASE STUDY	PRESENTATION	GROUP WORK	PARTICIPATION
WEIGHT	10%	15%	30%	20%	15%	10%
NOTE	< 80 % FAIL	Preparation, participation & presentation	Based on the topic Innovating through Collaboration/Smart/ Green Revolutions and projects around the world	Case study presentation	Group assignments	Active discussion & behavior

COURSE SCHEDULE

– WEEK I –

Thursday (27 June)

Introduction

Impact of technology on society

Types of impacts of technology
What is Industrial Ecology?
What is Sustainability?

Friday (28 June)

Why do we need Sustainability?
How to attain Sustainability?
What is Sustainable Manufacturing?

– WEEK II –

Monday (1 July)

Technology roles for Product Life Cycle Management
Bio-Mimicry
Eco-Industrial Parks
Understanding how stuff work

Tuesday (2 July)

Sustainable documentaries:

- Tapped
- The Future of Food
- Gasland
- Who killed the Electric Car
- Blue Vinyl

Technology spectrum – where are we in the state of the art?

Wednesday (3 July)

Sustainable Transport System - Automobile Industry:

- Smart and Green Cars
- Case Studies on Honda, Toyota and Hydrogen cars
- Design for the Environment
- Design for Recycling

Bio Fuels

Thursday (4 July)

Visit to Samsung Innovation Museum / any other interesting site

– WEEK III –

Monday (8 July)

Eco City

Case study on five cities going green: Ulsan, Korea
Case study on smart cities: Pangyo, Korea
Case study on green transport in Korea
Case study on water resource management in Korea
Case study on Eco-Industrial Park in Korea

Tuesday (9 July)

Pollution Prevention

- Pollution prevention approaches
- Measuring pollution prevention
- Pollution prevention tools and calculators

Waste Management

Plastic Bottles and sustainability

Role play

Wednesday (10 July)

Green buildings and sustainable infrastructure

Global warming

Deforestation

Teams/Groups Division

- Preparation for next day's Excursion

Thursday (11 July)

Sustainability Excursion:

- How much aware we are?
- Spreading Awareness

– WEEK IV –

Monday (15 July)

Groups' Discussion about the excursion

- Presentation on the excursion and experience

Recycling Workshop

Tuesday (16 July)

Students' Case Study

- Innovating through Collaboration
- Smart/Green Revolutions and projects around the world

Wednesday (17 July)

Various Smart and Green Revolutions and projects around the world

- Automobile Industry
- Electronics Industry
- E-commerce
- Service Industry
- Fashion Industry

Thursday (18 July)

Students Presentations – I

Friday (19 July)

Students Presentations – II

Final Remarks/discussions and Wrap-up