Sungkyunkwan University (SKKU) International Summer Semester (ISS) 2017
“New Experience, New Engagement”

Technology, Society and Sustainability
Prof. Navrati Saxena, Sungkyunkwan University

SHORT COURSE DESCRIPTION
In this course we will learn about how the technology and society have changed and affected each other. In addition to that, we will discuss about how we develop and manage our technology and society to be sustainable. Traditionally, industries focus on smarter, faster and productive performance. This however, is not enough in evolving economies and performance metrics is dominated by sustainability in this new era of hyper connected environment. One major challenge in a sustainable business is that of reinvention. Collaboration between various sectors for innovations is proving to be a potent tool for acceleration 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 more generally to how humans use natural resources in the 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 ecoregion, or national or global economy) as being separate from the biosphere, but to consider it as a particular case of an ecosystem - but based on infrastructural capital rather than on natural capital. It is the idea that as natural systems do not have waste in them, we should model our systems after natural ones if we want them to be sustainable and bring prosperity in our surrounding environments.

READING MATERIALS
Reading materials will be provided in advance during the course. All the PowerPoint slides and other course material will be provided in the class. The following are general background readings:

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Author</th>
<th>Year of Issue</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Perspectives on Industrial Ecology</td>
<td>Dominique Bourg, Suren Erkman</td>
<td>2003</td>
<td>1874719462</td>
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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.

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>ATTENDANCE</th>
<th>EXCURSION</th>
<th>CASE STUDY</th>
<th>PRESENTATION</th>
<th>DISCUSSIONS</th>
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<td>NOTE</td>
<td>&lt; 80 % FAIL</td>
<td>Preparation, participation &amp; presentation</td>
<td>Based on the topic Innovating through Collaboration/ Smart/Green Revolutions and projects around the world</td>
<td>Case study presentation</td>
<td>Active discussion &amp; behavior</td>
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COURSE SCHEDULE

– WEEK I –

**Tuesday (27 June)**
Introduction
What is Industrial Ecology?
What is Sustainability and why do we need it?
How to attain sustainability – various tools

**Wednesday (28 June)**
Bio-Mimicry
Eco-Industrial Parks
Understanding how stuff works

**Thursday (29 June)**
Cosmetic Industry
Water & Ocean Sustainability
- Grey water Recycling
- Case Study on Technological Ecology in Singapore – NEWater
- Case Study Korea: ARISU
- Case Study China: Industrial Wastewater treatment in China

**Friday (30 June)**
Visit to Samsung Innovation Museum / any other interesting site
Monday (3 July)
Pollution Prevention
- Benefits and Extracting Principles
- Life Cycle Assessment
Green Art: Intro
- Global Sustainability Issues and concerns
Waste Management
Plastic Bottles and sustainability

Tuesday (4 July)
Sustainable Transport System
Automobile Industry:
- Smart and Green Cars
- Case Studies on Honda, Toyota and Hydrogen cars
- Principles of Disassembly
- Design for the Environment
- Design for Recycling
Bio Fuels
Team/Groups Division
- Preparation for next day’s Excursion

Wednesday (5 July)
Sustainability Excursion:
- How much aware we are?
- Spreading Awareness

Thursday (6 July)
Groups’ Discussion about the excursion
- Presentation on the excursion and experience
Green buildings and sustainable infrastructure
Eco City
Global warming
Deforestation

Friday (7 July)
Recycle Workshop

– WEEK III –

Monday (10 July)
Students’ Case Study-I
- Innovating through Collaboration
- Smart/Green Revolutions and projects around the world

Tuesday (11 July)
Students’ Case Study-II
- Innovating through Collaboration
- Smart/Green Revolutions and projects around the world

Wednesday (12 July)
Students Presentations – I
**Thursday (13 July)**
Students Presentations – II

**Friday (14 July)**
Various Smart and Green Revolutions and projects around the world
Case Studies
- Automobile Industry
- Electronics Industry
- E-commerce
- Service Industry
- Fashion Industry
- Summing up the students’ case studies

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**Monday (17 July)**
Final Remarks/discussions and Wrap-up

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