Outline JEE 673 Waste and Climate Change
Semester 2/2019
Friday 13.30-16.30

Course Learning Outcome (CLO) : Understanding of climate change principle and its big picture in relation to waste and modern waste trends and management. Ability to show clear perception on link of waste management contribute to sustainable development, climate change and beyond. Capable to discuss in full dimension of treatment technology contribute to climate change include their projection and future perspective of waste and climate change. Increase skill in presentation, brain storming, and interact among students and instructor. Improve view of field experiments include national and global scale of waste to energy as mitigation options to abate climate change scenario. Understanding modern knowledge and trends related to current waste issue such as plastics waste and micro-plastics and circular economy

Mode of learning: Lecture, workshop, excursion, group discussion, term paper, discussion, gallery walk

	Date	Topics	Content	Mode of teaching	Instructor
Session 1 Understanding climate change and relation to waste management					
1	22 Jan 2020	Introduction to waste and Climate change	Principle of climate change and its relation of waste issues include positive and negative impact to waste management	Lecture and brain storming	Sirintornthep
Session 2 Global waste management and their future perspective solid waste and waste water					
2	29 Jan 2020	Global Waste Management Outlook I	Waste and the Sustainable Development Goals, Global waste management outlook, and waste management	Lecture /brain storming/gallery walk	Sirintornthep
3	5 Feb 2020	Global Waste Management Outlook II	Waste management in developed and developing countries	Lecture and brain storming	Komsilp
Session 3 How waste management contribute to climate change by technology					
4	12 Feb 2020	Mechanical Biological Treatment process & waste pretreatment	The aim of the MBT processes, waste preparation and separation processes	Lecture and discussion	Komsilp
5	19 Feb 2020	Composting technology and Anaerobic digestion technology	Composting process principles, compost mixture calculation, compost safety and quality. Fundamentals of anaerobic digestion, plant technology for biogas recovery, operation of biogas plants, and gas processing and options for utilization	Lecture and discussion	Komsilp

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6	26 Feb 2020	Thermal treatment	Waste & Refuse-derived fuel characterization. Desired fuel characteristics. Fundamentals of key thermal treatment technologies currently used around the world for waste treatment particularly those for energy & material recovery.	Lecture & Group work/discussion	Awassada
7	4 March 2020	Final disposal engineering	Guidelines for design and operation of municipal solid waste landfills in tropical climates	Lecture and discussion	Komsilp Awassada
8	11 March 2020	LCA of waste management		Lecture	Guess speaker
9	18 March 2020	Field visit	Visit waste management/waste disposal/waste to energy site	Site excursion. Students are recommended to prepare themselves for an onsite activities	Awassada/Komsilp
MIDTERM EXAMINATION (date TBA)25 March					
Session 4 inventory and reporting					
10	1 April 2020	How to estimate GHG emission from solid waste sector and waste water	Understanding concept and inventory GL (IPCC) and methodology (GHG protocol) to estimate GHG from waste sector. Example on waste model and GHG protocol are hand on training with discussion on activity data analysis and emission factor choosing	Lecture, hand on exercise And group discussion	Sirintornthep
Session 5 Forecasting and GHG mitigation					
11	8 April 2020	Waste forecasting	Principles of forecasting: models, relevant parameters, benefits, use of results.	Lecture & Workshop (Case study)	Awassada
12	22 April 2020	GHG mitigation and scenario development	GHG mitigation options for waste management. Balance of benefits between GHG mitigation, energy security, and costs,	Group discussion & Workshop (Case study)	Awassada

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			and society readiness, etc. Simple method to develop future scenarios.		
Session 6 MRV in waste sector					
13	29 April 2020	MRV for CDM and T-VER projects	Understanding measurement, reporting, and verification of climate change mitigation in waste sector	Lecture	Guess lecture or Komsilp
Session 7 Future perspective of waste and climate change –circular economy					
14	6 May 2020	Modern waste issue	Plastics and micro-plastic waste	Group discussion & Workshop (Case study)	Awassada
15	13 May 2020	Direction and fate of waste and climate change	Information exchange on the future direction of waste aspect to abate climate change with the moving toward sustainability development and circular economy	Discussion/gallery walk	Sirintornthep
FINAL EXAMINATION (date TBA) 20 May 2020					

Grading system

Contents	Score	Method of evaluation
Active participation	10 %	Attendance, enquiry, initiative and answer question
Class presentation	20%	Performance of understanding assigned presentation topics and well preparation
Evaluation of critical thinking in class	10%	Ability to identify key issues to discuss during learning with discussion capability.
Midterm exam*	30%	In depth comprehensive of related issues raise in the exam, initiate task/process raised (if any), understanding method of estimation and well computation in the question raised in the exam.
Final exam*	30%	In depth comprehensive of related issues raise in the exam, initiate task/process raised (if any), understanding method of estimation and well computation in the question raised in the exam.

Instructor :

Dr. Sirintornthep Towprayoon

Dr. Komsilp Wangyao

Dr. Awassada Phongphiphat