

**Course outline**  
**JEE 659 Energy from biomass, 3 (3-0-6), Semester 1/2019**  
**Monday 13.30 – 16.30 hr, EN3204**

**Instructor:** Dr.Nakorn Worasuwannarak (Coordinator), Dr.Savitri Garivait, Dr.Warinthorn Songkasiri, Dr. Horst Berthold Kreimes, Dr.Boonrod Sajjakulnukij, Prof.Shabbir Gheewala, Dr. Patrick Rousset

Objective of the course is for students to understand the advantages of bio-energy production and various technologies for biomass conversion for heat and power. Biomass resource assessment, handling and processing: charcoal and biomass briquette preparation, bio-fuel and biogas production. Thermal and thermo-chemical conversion processes: pyrolysis, gasification and combustion. Finally, the impact on environment and the policy framework for biomass utilisation will be discussed.

Session	Date	Details	Instructor
1	19 Aug	Overview of biomass and biomass fuel characterization	Dr. Nakorn
2	26 Aug	Biomass potential assessment	Dr. Savitri
3	2 Sep	Basic calculation of biomass combustion	Dr. Kreimes
4	9 Sep	Biomass pretreatment	Dr. Nakorn
5	16 Sep	Bio-oil production & upgrading	Dr. Nakorn
6	23 Sep	Biomass combustion technologies & CHP application	Dr. Kreimes
7	30 Sep	Other advanced biomass to liquid	Dr. Nakorn
	TBD	Midterm Examination	
8	7 Oct	Biomass gasification technologies & other advanced uses	Dr. Nakorn
9	21 Oct	Biogas production and utilization	Dr. Warinthorn
10	28 Oct	Bio-ethanol	Dr. Boonrod
11	4 Nov	Biodiesel	Dr. Boonrod
12	11 Nov	Economic assessment of biomass utilization system	Dr. Boonrod
13	18 Nov	Policy framework for biomass utilization	Dr. Boonrod
14	25 Nov	Environment and sustainability assessment of biomass utilization system	Prof. Shabbir
15	2 Dec	Case study of biomass pretreatment	Dr. Patrick
	TBD	Final Examination	

**Grading**

Midterm examination 50 %

Final examination 50 %