

King Mongkut's University of Technology Thonburi
Faculty of Engineering
Department of Mechanical Engineering

Course Syllabus

<i>Lecture Course:</i>	MEE433 Gas Turbine Theory
<i>Year/Term:</i>	Academic year 2010 Second semester
<i>Lecturer(s):</i>	Chawin Chantharasenawong (chawin.cha@kmutt.ac.th)
<i>Duration:</i>	42 hours of lectures (14 sessions of three-hour lectures)
<i>Prerequisite:</i>	MEE221 Thermodynamics
<i>Tutorial Hours:</i>	Arranged by appointments through email

Course breakdown

<i>Week No.</i>	<i>Description</i>
1	<i>Introduction</i>
2	<i>Shaft Cycle: Ideal Cycles</i> Assumption of Ideal Condition Simple Gas Turbine Cycle
3	<i>Shaft Cycle: Ideal Cycles 2</i> Regenerative Cycle Reheat Cycle Cycle with Reheat and Heat-exchanger Cycle with Intercooled Compression
4	<i>Shaft Cycle: Practical Cycles</i> Stagnation properties Compressor and Turbine Efficiencies Pressure Losses Heat-exchanger Effectiveness Mechanical Losses Variation of Specific Heat
5	<i>Shaft Cycle: Practical Cycles 2</i> Combustion Efficiency Simple Gas Turbine Cycle Regenerative Cycle Reheat Cycle Cycle with Reheat and Heat-exchanger
6	<i>Combined Cycles 1</i>

7	<i>Combined Cycles 2</i>
<i>Midterm Examinations</i>	
8	<i>Gas Dynamics</i> Isentropic flow in duct of varying area Shock wave in nozzle flow Plane normal shock wave Oblique shock wave
9	<i>Gas Turbine Cycle of Aircraft Propulsion</i> Turbofan Engine Turboprop Engine Thrust Augmentation
10	<i>Compressor Characteristics</i> Nondimensional qualities for plotting compressor characteristics Some deductions from the compressor characteristics
11	<i>Turbine Characteristics</i> Overall Turbine performance The cooled turbine
12	<i>Combustion Chamber 1</i> Form of combustion system The combustion process
13	<i>Prediction of Performance</i> Off-design operation of the single-shaft gas turbine Equilibrium running of a gas generator
14	<i>Project Presentation</i>
<i>Final Examinations</i>	

Course notes and delivery

A set of handout will be available online from <http://staff.kmutt.ac.th/~chawin.cha/> or <http://www.drchawin.com> Students are expected to make a copy and bring them to the class.

Handouts contain a summary of the materials described in the syllabus and students should consult recommended textbooks for further information on the subject.

Tutorial solutions will be available one week after the completion of each lecture.

Assessment

The course is assessed by tutorials (homework), course project, closed book mid-term and final examinations. The total grade is determined using the following weighting scheme.

1. Tutorials (homework)	5%
2. Course project	15%
3. Midterm examination	40%
4. Final examination	40%

- Each student is allowed to bring one non-graphical scientific calculator into examinations
- Students whose total marks are **below 30%** at the end of the semester will receive an *F*-grade and will be required to retake the subject
- Students must be present in all examinations otherwise they will receive an *Fe*-grade. Only extenuating circumstances will be accepted as an excuse for missing an exam. Health related excuses require medical reports and the signature of a physician that provided treatment.

Recommended textbooks

1. *Title:* Gas Turbine Theory (6th Edition)
Author: HIH Saravanamuttoo, GFC Rogers, H Cohen, and PV Straznicky
Publisher: Pearson/Prentice Hall
Relevance: A
2. *Title:* Gas Dynamics (3rd Edition)
Author: J John and T Keith
Publisher: Pearson
Relevance: A