INTERNATIONAL UNIVERSITY LIAISON INDONESIA

IULI

SYLLABUS

Date/ Revision	January 23th 2017
Faculty	Life Sciences
Approval	Dean of the Faculty of Life Sciences

SUBJECT : Engineering Economics

1. Identification of Subject:

Name of Subject	: Engineering Economics
Code of Subject	: ENEC-3600
SKS / ECTS	: 2/
Semester	: 5
Study Program	: Chemical Engineering, Biomedical Engineering and Food Technology
Lecturer	: Tutun Nugraha, BASc, MASc, Ph.D.

2. Competency

After having the course, students are expected to undestand time value of money, analysis of alternatives using net present value and internal rate of return, interest rates calculation, depreciation, taxes, and inflation.

3. Description of Subject:

This course will provide students some introductory knowledge on the economical consideration side of engineering. Students will learn basic concepts such as interests calculation, cash clow calculations, profitability, return of investment, capital investment, depreciation as well as other fundamental concepts repated to the intitiaion of a project.
The course is closely linked to the design course that they will experience in the 6th semester, in which the students will have to learn to calculate the profitability projections, capital investments as well as return of inverstment in the projectthat they are doing as part of the curriculum.

4. Learning Approach

Approach	: Lecture, lab practices, discussion during prelab question/answer
Method	: Discussion, question answer, sample problem, group work

DAAD
Federal Ministry of Education and Research
Coordinator
TECHNISCHE UNIVERSITÄT ILMENAU

PO Box 150, BSD CPA 15330
Tel. +62 21 50588000
+62 852 12318000
info@iuli.ac.id; www.iuli.ac.id
IULI – Eco Campus, The Breeze
Jl. BSD Grand Boulevard
BSD City 15345
Island of Java

Student Tasks : In class tutorial, research projects
Media : Power Point Presentation

5. Evaluation

a) Absence maximum : 25%
b) Daily Quizes/assignment : 40 points
c) Final Examination : 60 points
Total : 100 points

6. Contents/ Topics of Lecturing:

Week	Topics	Content	Remark
1	Introduction: Overview of Engineering Project Design	- Process Design development - Flowsheet Development - Computer Aided Design - Cost Estimation - Profitability Analysis of investment	Lecture, Group discusion, tutorial for exercise 2 x 50 minutes Peters, Timmerhaus and West, Chapter 1
2	Analysis of Cost Estimation - Cash Flow for industrial Operations - Factors Affecting Investment and Production Cost	- Cash Flow Cash Flow and Cummulative Cash positions - Sources of Equipment - Price Fluctuations - Company Policies - Operating time and rate of Productions	Lecture, Group discusion, tutorial for exercise 2 x 50 minutes Peters, Timmerhaus and West, Chapter 6
3,4,5	Analysis of Cost Estimation	- Capital Investment - Cost indexes - Cost Components in Capital Investment - Purchased equipment - Estimation Equipment cost by scaling - Equipment delivery - Equipment Installation - Intrumentation and controls - Piping - Electrical system - Buildings - Yard improvement - Service facilitites - Health Safety and Environment - Land - Engineering Supervision - Legal Expenses	Lecture, Group discusion, tutorial for exercise 3 x 2 x 50 minutes Peters, Timmerhaus and West, Chapter 6

DAAD Federal Ministry of Education and Research Coordinator TECHNISCHE UNIVERSITÄT ILMENAU
PO Box 150, BSD CPA 15330
Tel. +62 21 50588000
+62 852 12318000
info@iuli.ac.id; www.iuli.ac.id
IULI – Eco Campus, The Breeze
Jl. BSD Grand Boulevard
BSD City 15345
Island of Java

		- Construction expenses - Contractor's fees - Contingencies - Quiz/Evaluation	
6,7	Methods of estmating capital investment	- Estimation of capital investment - Estimation of revenue - Manufacturing cost - Variable productionc osts - Plant ovehead costs - General expenses - Quiz/evaluations	Lecture, Group discusion, tutorial for exercise 2 x 2 x 50 minutes Peters, Timmerhaus and West, Chapter 7
8	Midterm break		
9, 10,	Interest, Time value of money	- Interest: Simple interest, Compound interest, Nominal and effective interest rates, Continuous interests - Cost of capital: income tax effects, Loan payments - Time Value of Money	Lecture, Group discusion, tutorial for exercise 2 x 2 x 50 minutes Peters, Timmerhaus and West, Chapter 7
10, 11,12	Cash Flow Patterns and Compounding/Discounting factors	- Discrete cash flows - Continuous cash flows - Income taxes (central government taxes, taxable incomes, capital gains tax, Losses, provincial tax, non-income tax) - Fixed charges (Depreciation, Depreciationand income tax, Depreciable investment, Current value, Salvage value, Recovery period, Methods for calculationg depreciation, insurance and self-insurance - Examples	Lecture, Group discusion, tutorial for exercise 3 x 2 x 50 minutes Peters, Timmerhaus and West, Chapter 7
13, 14, 15	Profitability, Alternative investment and replacements	- Profitability standards - Cost of capitals - Minimuma cceptable Rateof return - Methods for calculationg profitability	Lecture, Group discusion, tutorial for exercise 3 x 2 x 50 minutes

DAAD Federal Ministry of Education and Research Coordinator TECHNISCHE UNIVERSITÄT ILMENAU
PO Box 150, BSD CPA 15330
Tel. +62 21 50588000
+62 852 12318000
info@iuli.ac.id; www.iuli.ac.id
IULI – Eco Campus, The Breeze
Jl. BSD Grand Boulevard
BSD City 15345
Island of Java

		- Without time value of money - With time value of money - Selecting a profitability method - Effectof inflation - Start up cost - Spread sheet for economic evaluation calculations - Alternative investments - Alternatives when sninvestment must be made - Alternatives - Replacements - Methods of profitability evaluation for replacement - Typical example of replacement policy - Book values and amortized values - Investment on which the replacement comparison is made - Quiz	Peters, Timmerhaus and West, Chapter 8
16, 17	**FINAL EXAMINATION**		

7. Book Reference:

a) Plant design and Economics for Chemical Engineers,Max Peters,Klaus D Timmerhaus, Ronald E West, McGRawHill Education, International Edition

b) Chan S Park, Fundamentals of Engineering economics, Pearson/Prentice Hall

8. Non TextBook Reading:

DAAD Federal Ministry of Education and Research Coordinator TECHNISCHE UNIVERSITÄT ILMENAU

PO Box 150, BSD CPA 15330
Tel. +62 21 50588000
+62 852 12318000
info@iuli.ac.id; www.iuli.ac.id

IULI – Eco Campus, The Breeze
Jl. BSD Grand Boulevard
BSD City 15345
Island of Java