

SYLLABUS:

Date / Revision April 2017/September 2017/IT
Faculty Engineering
Study Program Computer Science

SUBJECT: INTRODUCTION to ENGINEERING

1 Basic Information

1.01	Subject Name	INTRODUCTION to ENGINEERING
1.02	Semester	1
1.03	Level	1
1.04	SKS	1
1.05	Mandatory / Curriculum	
1.06	Subject Code	
1.07	Subject Code	
1.08	Year	
1.09	Quality Control	Final Test, see evaluation
1.10	Limitations	Min 12 and Max 32 students in one class
1.11	Combined with	
1.12	Pre-requisite	
1.13	Responsible	Head of Program Study
1.14	Revision	

2 Description of Subject

This course is split into two seasons; the first season provides an introduction to the engineering profession. Role model of engineering profession will be presented. Professional and ethical aspects of engineering are covered. Various forms of technical communication and working in teams are emphasized. The second season is about the history of invention, which will inspire and build innovative attitude for the student.

3 Objectives

- To be able to perform and take decision as engineer candidate
- To understand values and ethics as an engineer

4 Competency

- After having the course, students are expected to:
- Understand the profession of engineer
 - Understand ethics of engineer
 - Link Science concepts to Engineering practices.
 - Understand the process of innovation

5 Learning Approach / Methodology

- Lectures/ Class contact (time-tabled) supplemented with interactive questions and answers;
- Student Study Effort: homework/assignment; preparation for test/quizzes/ examination.

6 Evaluation

5.1	Absence maximum	25%
5.2	Participation in Discussion	05 Points
5.3	Homework / Classwork	05 Points
5.4	Presentation /Simulation	10 Points
5.5	Daily Quiz	20 Points
5.6	Final Examination	60 Points
	Total	100 Points

7 Text Book and Reference

- Main Text Book:**
Thinking Like an Engineer, an Active Learning Approach, Third Edition, Elizabeth A. Stephan et.al. Person, 2015, ISBN 978-0-13-359321-1

2	Supplement Textbooks: A Bridge Between Conceptual Framework Sciences, Society and Technology Studies, History of Mechanism and Machine Science, Vol 27, Marco Ceccarelli, Raffaele Pisano, Springer Science Business Media Dordrecht, 2015
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8 Content / Topics of Lecture

Week	Content/TopicsofLecturing	TextBookChapter	Remark
1-2	Choosing a Career, Choosing Engineering as a Career, Nae Grand Challenges for Engineering, Choosing a Specific Engineering Field, Engineering Technology—a Related Field, Gathering Information, Pursuing Student Opportunities	EVERYDAY ENGINEERING	Ref. a.
3	Ethical Decision Making, Plagiarism, Engineering Creed, Social Responsibility	ETHICS	Ref. a.
4	Design, Defining The Problem Or Need, Criteria: Defining What is Important, Generating Ideas, Comparing Designs and Making Decisions, Prototyping and Testing, Sustainability, Working in Teams, Experimental Design: Period Analysis, Project Timeline	DESIGN AND TEAMWORK	Ref. a.
5	Basic Presentation Skills, Sample Presentations, Basic Technical Writing Skills, Common Technical Communication Formats	ENGINEERING COMMUNICATION	Ref. a.
6	General Hints For Estimation, Estimation by Analogy, Estimation by Aggregation, Estimation by Upper And Lower Bounds, Estimation Using Modeling, Significant Figures, Reasonableness, Notation	ESTIMATION	Ref. a.
7	Defining SOLVEM, Representing Final Results, Avoiding Common Mistakes, Examples of SOLVEM	SOLVEM	Ref. a.
8	Midterm Break		
9	Oliver The Development of Linear Systems Theory Heaviside: Changing the Paradigm, Filters, Electronic Feedback Circuits, Feedback Control Systems, System Identification, The Mathematical Education of Information Engineers	Electronics and Information Engineering: A New Approach to Modelling 1880–1950	Ref. b.

10	Introduction. René Laennec, the Stethoscope and the Snowball Effect, Lindbergh, Carrel and Pump, Gibbon, His Wife and the Heart-Lung Machine, Lillehei, Bakken and Pacemaker, Starr, Edwards and Valve, Kolff, Jarvik and Artificial Heart	Heart Matters. The collaboration Between Surgeons and Engineers in the Rise of Cardiac Surgery	Ref. b.
11	Creativity as an Integral Part of Engineering Activity, Designing, Invention and Construction in Engineering Activity in the Light of Creativity, Producibility vs Creativity in Engineering Activity	Engineering Creativity: An Essay on Epistemological Analysis	Ref. b.
12	The Emerging of the Scientific Education of Engineers, Galileo's New Science as "Technoscience", The Structure of Natural-Scientific Theory	Galileo's "Technoscience"	Ref. b.
13	The Galilean Style of Experimental Practice, Four Ways of Conceptualizing Motion, Aspects of the Galilean Conceptualization of Motion	Mathematical Language as a Bridge Between Conceptualization of Motion and Experimental Practice	Ref. b.
14	Lazare Carnot's Biographical Note, Application of Living Forces Conservation Principle to Machines, Carnot's Theory of Machines	Lazare Carnot and the Birth of Machines Science	Ref. b.
15	Final Examination		