DE 498 Special Topics: Computing Tools for Solving Engineering Problems

Credit: **3 (3-0-6)** Semester: **2** Year: **2015**
Prerequisite: **None**

Instructors: **Krisada Chaiyasarn** Fri 9.30-12.30

Objectives: Students are expected to

- understand important functionalities in Excel that are necessary for engineers and be able to apply them accordingly
- be able to use simple scripting language to model and solve problems
- apply the course knowledge in their professional careers

Course Description: Introduction in using computer software to solve engineering problems, including modelling and data analysis by regression. Introduction to information design and various types of graphical representations. Introduction to commonly-used software functionalities in business. Introduction to advanced features and solving complex problems.

Course Materials www.krisadachaiyasarn.org/teaching/de-498
Contact ckrisada@engr.tu.ac.th

SESSION	TOPIC
	Introduction
1	Introduction to concepts of modelling and solving problems using excel and matlab and outline course syllabus.
	Introduction to Excel and basic functionalities
2	Shortcut, Basic Operations, Functions
	Class Exercise (5%)
3	Basic Arithmetic Function, Load takedown exercise
	Advance functionalities
4	Decision Functions, Data Mining
	Data Analysis and Graph plotting
5	Regression Analysis, Charts: Line, Bar Chart, Combination Chart, Information design
	Class Exercise (5%)
6	BOTDR example
	Macro and VBA
7	VBA User-Defined Functions, VBA Subroutines, User Forms
	Modelling and Using Solver
8	Modelling Stress, Centroid of a Polygon, Root finding, Goal Seek

	Class Exercise (5%)
9	Engineering Template Design Examples
	Introduction to Matlab and Coursework Problems
10	Input and Output, Vectors and Matrices, Matlab Interface, explain the coursework
	Operators
11	Arithmetic and logical operators
	Function and software
12	Wring functions and m-files, useful functions
	Class Exercise (5%)
13	TBA
	Graphics and Data Handling
14	Plotting in Matlab and Import and export data in Matlab
	Coursework tutorial
15	Q&A sessions on the coursework

COURSEWORK

To be announced.

MAIN TEXTBOOK:

Mike Girvin, *Ctrl+Shift+Enter: A Book About Building Efficient Formulas, Advanced Formulas, and Array Formulas for Data Analysis and Calculating Problems*

Brian R. Hunt*, A Guide to MATLAB: For Beginners and Experienced Users*

REFERENCES:

- http://www.informationisbeautiful.net/
- http://chandoo.org/
- http://www.mathworks.com/academia/student_center/tutorials/launchpad.html

GRADING POLICY:

Class attendance	5 %
Assignments	20 %
Mid-tem examination (1-8)	25 %
Final examination (9 - 15)	25 %
Coursework	25%