CEV319 Computer Applications in Environmental Engineering
Fall 2022

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Course Schedule:
Fridays, 09:00 - 11:50 (Computer Lab 1044)

Course Homepage: http://rkgoktas.wordpress.com/CEV319

Course Objectives: The objective of this course is to provide an introduction to the use of computer-based applications in environmental engineering. The focus will be on generic tools such as spreadsheets (i.e. Excel) and computational programming (i.e. MATLAB, Python). The role of computer-based methods in environmental engineering practice will be discussed.

Course Content: Introduction to the use of computer-based applications in environmental engineering. The use of spreadsheets (tables, functions, graphs). Basic MATLAB (basic features, functions, plotting tools, computational tools). Data analysis with Python. Overview of engineering software tools. Overview of available environmental engineering software tools.

At the end of the course, you will:
- *have an understanding of the contribution of computer applications in solving environmental engineering problems*
- *have the skills to choose the right computer application for the problem at hand.*
- *develop skills for using the proper computer applications as problem solving tools.*

Resources

Textbooks

- Liengme's Guide to Excel 2016 for Scientists and Engineers: Windows and Mac. 2019. Bernard V. Liengme and Keith Hekman. Elsevier.
- MATLAB: An Introduction with Applications. 2017. Amos Gilat. Wiley.

Reference Books

- Excel 2013 for Scientists. 2014. Gerard Verschuuren. Holy Macro! Books.
- Environmental Data Analysis with MATLAB. 2nd Edition. 2016. William Menke & Joshua Menke. Elsevier.
- MATLAB: A Practical Introduction to Programming and Problem Solving, 4th Edition. 2017. Stormy Attaway. Elsevier.
- Computer Programming with Matlab, 1st Revised PDF Edition. 2015. J. Michael Fitzpatrick and Akos Ledeczi.
- Essential MATLAB for Engineers and Scientists, 5th Ed. 2013. Hahn, B. and Valentine, D.
  available through KOÜ Library at Safari Books Online:
  http://proquestcombo.safaribooksonline.com/book/computer-aided-engineering/9780123943989
- A Guide to MATLAB for Beginners and Experienced Users, 2nd Edition. 2006. B.R. Hunt, R.L. Lipsman, J.M. Rosenberg, K.R. Coombes, J.E. Osborn, G.J. Stuck. Cambridge University Press.

Websites

- http://www.engineers-excel.com/index.htm
  Excel examples for engineering applications
- https://www.halvorsen.blog/documents/programming/matlab/matlab_basics.php
  MATLAB Basics by Hans-Petter Halvorsen

Grading:

Activity	Weight
Class Participation	14%
Quizzes (there will be 2 of them)	56%
Final Exam	30%
OVERALL	**100%**

Tentative Syllabus

Date	What is going to be covered?
23 September 2022	Introduction to the Course
30 September 2022	Introduction to Spreadsheets
7 October 2022	Introduction to Octave/MATLAB
14 October 2022	Using Functions in Excel
21 October 2022	Arrays in Excel and Octave/MATLAB
28 October 2022	Conditional Functions in Excel
4 November 2022	Charts in Excel
11 November 2022	Data Management and 2D Plots in Octave/MATLAB
18 November 2022	Table Lookup Functions in Excel
25 November 2022	Excel's Goal Seek & Excel's Solver
2 December 2022	Regression in Excel
9 December 2022	Polynomials, Curve Fitting & Interpolation in Octave/MATLAB
16 December 2022	Numerical Integration
23 December 2022	Solving Differential Equations

CLASS PARTICIPATION

Your participation in the class will be graded. It will contribute to **14%** of your overall grade.

At the start of the semester, every student has **70 points**.

During the semester, you will be able to increase your points. **In-class contributions** (e.g. participating in the solution of example problems and participating in meaningful discussions during the lectures) **may earn you 5 points**.

Any negative contribution (i.e. disturbing peaceful conduct of the lectures) **may lose you 5 points**.

You can check **"Laboratuvar"** in the university's online course system to see your current grade for class participation.