Academic Year 2024/2025, periods P1-P2

Syllabus:
Mathematics for Economists 3678 (on-line, asynchronous course)

Instructor: $\overbrace{\text{Agnieszka}}^{name}$ $\overbrace{\text{Jach}}^{surname}$, agnieszka.jach@hanken.fi

Office hours: Thursday 16-17h in the virtual room via Teams (link on Moodle)

Textbook: Either of the two options:

1. Option 1) K. Sydsaeter, P. Hammond, 'Essential Mathematics for Economic Analysis', Pearson, 4th edition, 2012 (also available as an e-book from Hanken's library) and K. Sydsaeter, P. Hammond, 'Further Mathematics for Economic Analysis', Pearson, 2nd edition, 2008, or
2. Option 2) K. Sydsaeter, P. Hammond, 'Mathematics for economic analysis', Prentice-Hall, 1995

Course outline follows chapters from Option 2, K. Sydsaeter, P. Hammond, 'Mathematics for economic analysis', Prentice-Hall, 1995. See Table 2 below for chapter correspondence between Option 1 and Option 2.

Teaching materials available on Moodle: Detailed weekly guidelines for self-study; weekly tasks follow recommended agenda from Table 1. Theory slides, exercise set (and solutions), computer lab notes in a Jupyter-Notebook format, video links to exercise sessions recorded in 2018, discussion forum, instructions for installing software, useful links, etc.

Software: `Python` (computing, symbolic calculations and graphics) and `markdown` (generation of documents with `latex` syntax for type-setting mathematical formulas) used in `Jupyter Notebook`. All software ingredients can be obtained at once by installing `Anaconda` (instructions can be found on Moodle).

Marks: 90% for the final exam plus 10% for the assignments/quizzes

Final exam (90%): exam consists of 8-10 exercises embedded into a Moodle quiz; exam has to be performed in max. 6h, 09:00h-15:00h; exam dates: 19.12.2024 (Thu; first attempt), 08.02.2025 (Sat; second attempt); exercises have to be answered sequentially (you can only go forward; you cannot go back to modify your answers)

- some of the exercises will have answers/solutions to be entered directly into a given quiz question/exercise (they might involve software component), and
- some of the exercises will have answers/solutions to be provided by uploading a Jupyter Notebook file to Moodle, with all the calculation steps and comments type-set using markdown and latex syntax; a corresponding template .ipynb file will be supplied by the teacher

Pre-requisite: to be allowed to take the exam, you need to pass at least one ComputerQuiz (to demonstrate that you know how to open, dissect, modify, etc a Jupyter Notebook file, and that you can use markdown and latex syntax) .

Assignments/Quizzes ($\mathbf{10\% = 10 \times 1\%}$): ten Moodle quizzes; each quiz has to be performed in max. 6h from when you start/open it; quiz opens at 00:00h and closes at 23:59h on a given Friday - see Table 1 for the exact dates; exercises have to be answered sequentially (you can only go forward; you cannot go back to modify your answers)

- 7 Moodle quizzes requiring calculations 'by hand' (show-your-work type) and choosing intermediate and/or final answers in the quiz questions; with possibly short, software-related questions; there will also be questions where answers have to be entered as an algebraic expression using special syntax; as a preparation for the final exam, it is recommended that you type-set at least some of your solutions in Jupyter Notebook, using markdown and latex syntax
- 3 Moodle quizzes which are software-based
- 1 Moodle quiz that is optional (for bonus 1%), Quiz0

Week	Dates (Mon-Fri)	Chapters	Quiz to be perfomed in max. 6h from when you start; quiz opens at 00:00h and closes at 23:59h of a given Fri
36	02-06.09	1.Intro.,2.Func. of one var., 3.Polyn., Powers, Exp.,4.Diff.	Quiz0 (Ch.1-3), optional
37	09-13.09	5.More on Differentiation	Quiz1 (Ch.4-5)
38	16-20.09	6.Limits, continuity, series	CompQuiz1
39	23-27.09	7.Implications of cont. and diff.	Quiz2 (Ch.6-7)
40	30.09-04.10	8.Exp and Log, 9.Optim	CompQuiz2
41	07-11.10	9.Optim	Quiz3 (Ch.8-9)
42	14-18.10	10.Integration, 11.More on integ.	Quiz4 (Ch.10-11)
43	21-25.10	P1-P2 break	P1-P2 break
44	28.10-01.11	12.Lin Alg, 13.Determ., Matrix Inv	Quiz5 (Ch.12-13)
45	04-08.11	14.More on Lin Alg	CompQuiz3
46	11-15.11	15.Func. of several var., 16.Tools for Comp. Statics	Quiz6 (Ch.13-14)
47	18-22.11	17.Multiv. Opt, 18.Constrained Opt	
48	25-29.11	18.Constrained Opt	Quiz7 (Ch.15-18)

Table 1: Recommended agenda for self-study (chapters follow textbook Option 2: 'Mathematics for economic analysis')

Option 1		Option 2
'Essential Mathematics for Economic Analysis'	'Further Mathematics for Economic Analysis'	'Mathematics for economic analysis'
Ch.1-3		Ch.1, Appendices A-B
Ch.4-5		Ch.2-3
Ch.6, 7.1-7.7		Ch.4-5
Ch.7.8-7.12, part of Ch.8, 10		Ch.6-8
Ch.8		Ch.9
Ch.9		Ch.10-11
Ch.15-16	Ch.1	Ch.12-14
Ch.11	Ch.1-2	Ch.15
Ch.12	Ch.2	Ch.16
Ch.13		Ch.17
Ch.14		Ch.18

Table 2: Chapter correspondence between textbook Option 1 and Option 2: Option 1) K. Sydsaeter, P. Hammond, 'Essential Mathematics for Economic Analysis', K. Sydsaeter, P. Hammond, 'Further Mathematics for Economic Analysis' Option 2) K. Sydsaeter, P. Hammond, 'Mathematics for economic analysis'