CHALMERS | GÖTEBORGS UNIVERSITET
Matematiska Institutionen
Peter Kumlin

13th March 2003

TMA401 Functional Analysis
MAN670 Applied Functional Analysis
4th quarter 2002/2003

All document concerning the course can be found on the course home page:
http://www.math.chalmers.se/Math/Grundutb/CTH/tma401/

Lecturs/Examination

Peter Kumlin
tel 772 3532
email: kumlin@math.chalmers.se

Literature

[1] Debnath/Mikusinski: Introduction to Hilbert Spaces with Applications, 2nd ed. Academic Press
[2] notes on Fixed point theory, L^p-spaces, BWP for ODEs, spectral theory and additional exercises that will be handed out during the course.

Content

The course treats normed spaces, Banach and Hilbert spaces, contractions, compactness, Brouwer and Schauder fixed point theorems, operators on Hilbert spaces, spectral theory for compact self-adjoint operators, Fredholm's alternative, applications to differential and integral equations, optimization.

Hours and rooms

Wednesdays 8 – 12 in MD6 except 30th April in VÖ11
Fridays 13 – 17 in MD6

Examination

The examination is based on a written examination (that will be scheduled after a consultation with the participants) and three handins (not compulsary). These three assignments consists of some problems that can be solved by the techniques presented in the course. The problems will be distributed at least one week before the handins are due. The handins can give some bonus points. Note that the bonus points expires after one yaer.

Weekly plan (tentative)

week 1 [1] Chapter 1

week 2 [2] Fixed point theory, [1] Chapter 5:1-2

week 3 [2] L^p-spaces, [1] Chapter 3

week 4 [1] Chapter 5:3-7, 4:1-3

week 5 [2] Ordinary differential equations

week 6 [1] Chapter 4

week 7 [2] Spectral theory

week 8 [1] Chapter 9:1-5

Note that week 4 ends on Friday 11th April and week 5 begins on Monday 28th April.