Kursnamn Applied Mathematics
Name of course

Omfattning (högskolepoäng) 5
ECTS credits

Tidsperiod September-October 2014
Course period

Antal platser 40
Maximum number of participants

Undervisningsspråk English
Language of instruction

Kursens syfte samt motivering till varför den bör vara fakultetsgemensam (max 150 ord)
Aim of course and motivation as to why it should be considered “multidisciplinary” to the extent that the faculty should allocate extra financing.
The aim of the course is to introduce modern mathematical methods within applied mathematics to doctoral students and advanced undergraduate students majoring in other areas than mathematics. Students from more than 30 different areas have taken the course so far. It is also available for master students.

Kursinnehåll, kursens uppläggnings samt examinationsform (max 150 ord)
Contents, study format and form of examination

The course consists of 15 two hour-lectures and covers five of the following ten rather independent topics (teachers/students choice):
1. Dimensional analysis and scaling,
2. Introduction to perturbation methods,
3. Introduction to calculus of variations,
4. Introduction to the theory of partial differential equations,
5. Introduction to Sturm-Liouville theory, the theory for the corresponding generalized Fourier series and some further methods for solving PDE,
6. Introduction to transform theory with applications,
7. Introduction to Hamiltonian theory and isoperimetric problems,
8. Introduction to the theory of integral equations,
9. Introduction to the theory of dynamic systems, chaos, stability and bifurcations,
10. Discrete mathematics with applications.
It also gives brief information about some other useful techniques in Applied Mathematics (theory of distributions, similarity methods, FEM, finite difference methods, BEM, homogenization, interpolation, etc.)
Examination: written examination at the end of the course. Compulsory assignments during the course.

Målgrupp(er (specifera ämnen/inriktningar) samt rekommenderade förkunskaper
Target group/s (specify, if possible, subject/specialization) and recommended background
All types of students with the recommended background, which is a first university course in analysis, linear algebra and ordinary differential equations.
Huvudansvarig institution  Department of Mathematics  
Department with main responsibility

Andra inblandade institutioner (specifiera hur).  
Other departments involved (specify how).

Kontaktperson/er (namn, e-postadress)  
Contact person (name, e-mail address)  
Volodymyr Mazorchuk, mazor@math.uu.se

Anmälan om kursdeltagande till  
Application from course participants should be sent to  
Fredrik Lannergård, fredrik.lannergard@math.uu.se

Senast  August 20, 2014  
Not later than