COURSE DETAIL

SCIENTIFIC COMPUTING
Country Denmark
Host Institution University of Copenhagen
Program(s) University of Copenhagen
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Mathematics Computer Science
UCEAP Course Number 175
UCEAP Course Suffix
UCEAP Official Title SCIENTIFIC COMPUTING
UCEAP Transcript Title SCIENTIFIC COMPUTNG
UCEAP Quarter Units 6.00
UCEAP Semester Units 4.00

Course Description
This course is a study of the general techniques and ideas found in professionally written numerical software, as well as the general concepts students need to know to apply suitable software to computational problems. The course is designed more for potential users of mathematical software than for potential creators of such software. At the completion of the course, students are able to choose an appropriate numerical method to solve a problem, and evaluate the numerical method with respect to potential accuracy, computational efficiency, and memory requirements. Students are also taught to perform the required computations using Matlab or similar systems, and then evaluate the quality of the solution with respect to the accuracy obtained and the sensitivity to model parameter variations. They then estimate whether the quality of the solution is adequate relative to the desired use of the model, and analyze the reasons behind a possible total failure of a method when applied to a concrete problem. This course also covers simple mathematical models from science and numerical analyses of them. Students learn about fundamental numerical methods for the solution of linear and nonlinear equations, linear and nonlinear optimization, eigenvalue problems, initial value problems for ordinary differential equations, partial differential equations, and the fast Fourier transform.

Language(s) of Instruction
English

Host Institution Course Number
NDAA07012U

Host Institution Course Title
SCIENTIFIC COMPUTING

Host Institution Course Details

Host Institution Campus
Science

Host Institution Faculty

Host Institution Degree

Host Institution Department
Niels Bohr Institute; Chemistry

Course Last Reviewed

Print