



LUND
UNIVERSITY

Faculty of Science

NUMN15, Numerical Analysis: Numerical Methods for Computer Graphics, 7.5 credits

*Numerisk analys: Numeriska metoder inom datorgrafik, 7,5
högskolepoäng*

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2007-04-12 to be valid from 2007-07-01, autumn semester 2007.

General Information

The course is an elective second-cycle course for a degree of Master of Science in Mathematics.

Language of instruction: English and Swedish

Main field of studies

Mathematics

Depth of study relative to the degree requirements

A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The aim of the course is that students upon its completion should have acquired the following knowledge and skills:

Knowledge and understanding

The student should be able to design computable approximations to curves and surfaces. Furthermore the student should be able to independently implement and use modern algorithms.

Skills and abilities

Student should be able to independently choose, implement and use advanced computational algorithms on a computer and should be able to assess the relevance and precision of the result.

Assessment skills and approach

The student should during the course

- With adequate terminology, in a logical and well-structured way account for design of advanced numerical methods and algorithms.
- With adequate terminology, in an algorithmic and well-structured manner account for numerical approximation of curves and surfaces.

Course content

The course consists of one part comprising 7.5 credits.

Polynomial - and Spline interpolation, Bézier curves, the de Casteljau algorithm, blossoms, the de Boor algorithm and de Boor points, control polygons, NURBS, and different ways to parameterize curves. Surfaces and algorithms for the two-dimensional case.

Course design

The teaching consists of lectures and computer exercises.

Assessment

Assessment takes the form of written laboratory reports to be handed in during the course.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.

To pass the entire course, approved laboratory reports are required.

The final grade is based on the joint grades on the laboratory reports.

Entry requirements

For admission to the course, general entry requirements, English B and good programming skills, acquired through the course NUMA12 Numerical approximation, 7.5 credits, or in a different way, are required .

Further information

The course may not be included in a higher education qualification together with NUM117 Numerical methods in computer graphics, 7.5 credits.

Subcourses in NUMN15, Numerical Analysis: Numerical Methods for Computer Graphics

Applies from H07

0701 Numerical Methods for Computer Graphics, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction