UNIVERSITY OF SKÖVDE

COURSE SYLLABUS

Mathematical Models for Game Programming G1F

15 credits

Course code: MA317G
Version number: 4
Valid from: 1 July 2021
Ratified by: Curriculum Committee for Engineering Science
Date of ratification: 7 June 2021

1. General information about the course

The course is provided by the University of Skövde and is named Mathematical Models for Game Programming G1F (Matematiska modeller för spelprogrammering G1F). It comprises 15 credits and is a first-cycle course. The level of progression is G1F.

The course is a part of the subject of Mathematics/Applied Mathematics. The disciplinary domain of the course is Natural Sciences.

2. Entry requirements

The course has the following entry requirements: passed IT148G Game Programming 1 G1N (or the equivalent).

3. Course content

The aim of the course is to give an integrated conceptual framework needed to work with mathematical problems as a game programmer. The course adresses a number of basic concepts, models and methods from primarily linear algebra and discrete mathematics, such as vectors, matrices, scalar and vector product, linear transformations, inverses, complex numbers, quaternions, sets, graph theory, combinatorics, probability theory, state machines and logic. Particular focus is set on using such concepts and models to realize game implementations.

4. Objectives

After completed course the student should be able to:

- formulate and analyze simple modelling problems in game programming using primarily linear algebra and discrete mathematics,
- use mathematical concepts and methods to realize solutions to common problems in game programming, and,
- interpret mathematical text in the area and communicate reasoning and computation in a clear and comprehensive way.

5. Examination

The course is graded G (Pass) or U (Fail).

The examinations of the course consist of the following modes of assessment:

- **Written assignment**
  10 credits, grades: G/U
- **Seminar assigmnets**
  5 credits, grades: G/U

Students with a permanent disability who have been approved for directed educational support may be offered adapted or alternative modes of assessment.

6. Types of instruction and language of instruction

The teaching is comprised of lectures, supervision and seminars.

Depending on the study period, the language of instruction may be Swedish or English. Even if the teaching is conducted in Swedish, some English may still occur.

7. Course literature and other educational materials

Dunn, F. and Parberry, I. (2011). *3D Math Primer for Graphics and Game Development, Second Edition*. CRC Press. ISBN 978568817231.

Eriksson, K. och Gavel, H. (2013). *Diskret matematik och diskreta modeller*. Studentlitteratur AB. ISBN 9789144089997.

8. Student influence

Student influence in the course is ensured by means of course evaluation. The students are informed about the results of the evaluation and potential measures that have been taken or are planned, based on the course evaluation.

9. Additional information

Further information about the course, as well as national and local governing documents for higher education, is available on the website of the University of Skövde.