

**SYLLABUS**

# **Computer game physics 7.5 credits S0009D**

**Datorspelsfysik**

**Course syllabus admitted: Autumn 2021 Sp 1 - Present**

**DECISION DATE  
2021-02-17**

# Computer game physics 7.5 credits S0009D

## Datorspelsfysik

### First cycle, S0009D

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Medieteknik	Computer Technology

## Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and programming skills such D0037D Object Oriented Programming, S0006E Real-time computer graphics programming, D0041D Data structures and algorithms. Mathematical equivalent M0050M Basic Mathematics and Derivatives and M0051M Integrals, Vectors and Matrices or equivalent.

## Selection

The selection is based on 1-165 credits.

## Examiner

Patrik Holmlund

## Course Aim

The course gives an overview of physics-based realism in games and other real-time simulations.

After course completion, the student should be able to demonstrate:

- broad knowledge in the field of computer games physics to understand the system level
- an ability to apply knowledge of mathematics and science for specific issues. As shown through the presentation of concepts of physics-based realism in computer games
- an ability to model, simulate, predict, and evaluate methods and algorithms for physics simulations in games. As shown through the simulation lab
- an ability to identify the need for further knowledge and to continuously upgrade their skills. As shown through the presentation of an in-depth study of the identification of further work
- an ability to understand, implement, and develop algorithms for physics simulations in games
- an ability to understand and implement physics simulations at the system level in a game engine
- knowledge of computer games, role of physics in computer games, as well as insight into the development process

## Contents

In this course covered:

- Kinematics
- Forces
- Collisions
- Projectiles
- Vehicle Physics
- Rigid Bodies
- Particle System

## Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The course consists of lectures, lab assignments, and seminars. Seminars are based on recent scientific publications. Mandatory participation in laboratory work and seminars.

## Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.

Compulsory assignments and seminars. Oral presentation.

## Literature. Valid from Autumn 2011 Sp 1

Ian Millington: Game Physics Engine Development, ISBN-10: 012369471X

## Course offered by

Department of Computer Science, Electrical and Space Engineering

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0009	Laboratory work	G U 3 4 5	5.5	Mandatory	A20	
0010	Presentation	U G#	2	Mandatory	A20	

## Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

## Last revised

by Jonny Johansson, HUL SRT 2021-02-17

## Syllabus established

by LTU Skellefteå 2007-12-08