SYLLABUS

Networked Virtual Environments 7.5 credits D7038E

Nätverksbaserade virtuella miljöer

Course syllabus admitted: Autumn 2015 Sp 1 - Autumn 2017 Sp 2

DECISION DATE
2015-02-16

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LULEÅ TEKNISKA UNIVERSITET

Networked Virtual Environments 7.5 credits D7038E

Nätverksbaserade virtuella miljöer

Second cycle, D7038E

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

Entry requirements

Courses of at least 90 credits at the first cycle, including the following knowledge/courses, must be completed before taking this course. The student is assumed to be conversant with linear algebra (to a level corresponding to that in the course M0031M Linear Algebra and Differential Equations) as well as fundamental algorithms and data structures (corresponding to D0012E Algorithms and Data Structures).
Furthermore, the student should be able to program large programs, in an object-oriented language like Java, that communicate with each other over a computer network (corresponding to what the two courses D0002E Computer Communications and D0010E Object-oriented programming and design gives).

Selection

The selection is based on 30-285 credits

Examiner

Håkan Jonsson

Course Aim

The course is about realistic, distributed, virtual, and graphical 3D environments realized over computer networks when the environments are dynamic and interactive. The goal with the course is to give

1. theoretical knowledge about such environments,
2. practical ability to implement such environments, and
3. ability to evaluate and reason about the properties of such environments.

Contents

Geometric transforms and representations. Hierarchical data structures and algorithms that operate on these. Basic creation of computer graphics based on 3D objects and scene graphs. Designing and programming virtual environments. Characteristic properties of distributed virtual environments. Common communication architectures. Principles for handling distributed and dynamic state. System design. Efficient handling of resources. and techniques to obtain scalability.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
The teaching consists of lectures, in a lecture hall or via recorded videos on the web ("flipped classroom"), and laboratory work/assignments. Parts of the teaching could be based on "peer review" (in particular, the assignments and the project) and "peer instruction".

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. Theoretical knowledge is examined/tested throughout the course via the theoretical assignments. Practical ability is examined/tested via the laboratory work (programming assignments). The ability to evaluate and reason is examined/tested via the theoretical assignments and the project but to some degree also via the laboratory work. The project must be presented both in writing and orally.

To pass the course, a student must pass all examinations/tests. The way the course is given, and the continuous examination used, makes it necessary for students that do not pass to retake the unsuccessful examinations/tests next time the course is given. The final grade is decided based on the grades on the examinations/tests.

Literature. Valid from Autumn 2015 Sp 1

To be finalised latest 3 weeks before the course starts.

Course offered by

Department of Computer Science, Electrical and Space Engineering

Items/credits

No items/credits available

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.

Syllabus established

by Jonny Johansson, HUL SRT 2015-02-16