This course syllabus is replaced by a new version.
The new version is valid from Spring semester 2013

ÖREBRO UNIVERSITY

Course Syllabus

School of Science and Technology

Computer Science, Agent-based Simulation, Advanced Course, 7.5 Credits

Course Code:	DT3022	**Subject Area:**	Field of Technology
Main Field of Study:	Computer Technology	**Credits:**	7.5
		Subject Group (SCB):	Computer Science
Education Cycle:	First Cycle	**Progression:**	G2F
Established:	2008-11-05	**Last Approved:**	2009-03-18
Valid from:	Autumn semester 2009	**Approved by:**	Head of School

Aims and Objectives

General aims for first cycle education

First-cycle courses and study programmes shall develop:
- the ability of students to make independent and critical assessments
- the ability of students to identify, formulate and solve problems autonomously, and
- the preparedness of students to deal with changes in working life.

In addition to knowledge and skills in their field of study, students shall develop the ability to:
- gather and interpret information at a scholarly level
- stay abreast of the development of knowledge, and
- communicate their knowledge to others, including those who lack specialist knowledge in the field.

(Higher Education Act, Chapter 1, Section 8)

Course Objectives

The objectives of this course are to:
- provide students with the basic concepts of multi-agent systems, emphsizing the topics of coordination mechanisms, agent-based simulation and complex emerging behavior.
- provide students with a range of theoretical and practical tools specifically geared towards applying MAS-based techniques for agent-based optimization and computer game development.
- develop students' ability to seek out and value knowledge on a scientific level in the field of multi-agent systems, follow the development of knowledge, and exchange knowledge with people lacking special knowledge in the field.

Main Content of the Course

The course includes both theoretical and practical issues related to multi-agent systems and simulation, and is organized into two units:

Course unit I, Theory (4 credits):
- Introduction to multi-agent systems - brief history, basic definitions, overview of notable multi-agent based applications;
- Agent-based simulation - cellular automata, agent-based modeling, emerging complex behavior, artificial life; swarm intelligence, ant colony optimization; flocking, herding, schooling;

Course unit 2 - Lab exercises (3.5 credits):
- Hands-on experience -Cellular automata, agent-based traffic control, flocks/herds/swarms.

Teaching Methods

Lectures and computer exercises.

Students who have been admitted to and registered on a course have the right to receive tuition and/or supervision for the duration of the time period specified for the particular course to which they were accepted (see, the university's admission regulations (in Swedish)). After that, the right to receive tuition and/or supervision expires.

Examination Methods

Theory, 4 Credits. (Code: 0100)
Examination by written test

Laboratory Exercises, 3.5 Credits. (Code: 0200)
Examination by written and oral reporting of exercises.

For further information, see the university's local examination regulations (in Swedish).

Grades

Unless otherwise prescribed in the course syllabus, a grade is to be awarded on completion of a course. The grade is to be determined by a teacher specifically appointed by the higher education institution (an examiner) (Chapter 6, Section 18, Higher Education Ordinance).

Unless the higher education institution prescribes another grading system, one of the following grades is to be used: fail, pass, or pass with distinction (Chapter 6, Section 19, Higher Education Ordinance).

Grades used on course are Fail (U), Pass (G) or Pass with Distinction (VG).

Theory
Grades used are Fail (U), Pass (G) or Pass with Distinction (VG).

Laboratory Exercises
Grades used are Fail (U) or Pass (G).

For further information, see the university's local examination regulations (in Swedish).

Specific entry requirements

Computer Engineering, Object-Oriented Programming, Intermediate Course 7,5 ECTS credits, Computer Engineering, Artificial Intelligence, Intermediate Course 7,5 ECTS credits and Computer Engineering, Methods for Modeling, Simulation and Visualisation, Intermediate Course, 7,5 ECTS credits.

For further information, see the university's admission regulations (in Swedish).

Transfer of Credits for Previous Studies

Students who have previously completed higher education or other activities are, in accordance with the Higher Education Ordinance, entitled to have these credited towards the current programme, providing that the previous studies or activities meet certain criteria.

For further information, see the university's local credit transfer regulations (in Swedish).

Other Provisions

The prerequisites for the course are the courses Object-Oriented Programming and Artificial Intelligence, or the course Applied Computer Science B, and Simulation introduction course.

Reading List and Other Teaching Materials

Required Reading

.

Additions and Comments on the Reading List

Föreläsningsanteckningar och artiklar tillhandahålls av läraren.