UNIVERSITY OF SKÖVDE
School of Informatics

COURSE SYLLABUS

Vetenskaplig teoribildning inom informationsteknologi, Forskarnivå
Scientific Theory in Informatics, Post-graduate level
7.5 credits

Course Code: IT0919F
The Course Syllabus applies from: Jan 1, 2019
Date of Approval: Dec 10, 2018
Version Number: 1
Third-cycle Subject Area: Informatics
Academic Level: Post-graduate level

1 Name, Scope and Level of the Course
The course is given by the University of Skövde and is named Scientific Theory in Informatics, Post-graduate level. It comprises 7.5 credits and is on Post-graduate level.

2 Objectives
After completed course the PhD student should be able to:

- know and apply a variety of scientific theories representative of research and teaching within Informatics;
- explain the scientific method and its limitations;
- distinguish between scientific and un-scientific theories;
- understand differences between theory forms, purposes and components in the Informatics disciplines;
- understand and use the terminology of scientific theory, for example: model, framework, concept, variable, proof; and
- construct a representative theory in the context of their own study discipline, which could in principle be developed and/or tested so that it could be published.

3 Course Content
The course addresses central scientific theories in informatics. At the University of Skövde, informatics is defined as the discipline that addresses how information is represented, processed, and communicated in artificial and natural systems. As such, it is the study of the design and development of systems that effect the timely, effective, and efficient provision of information for individuals, organizations, and society.

A representative sample of core theories techniques are drawn from the body of knowledge in the of informatics discipline. The topics may include the following:

- Complexity theory
- Computability and automata theory
- Basic cognitive psychology
- Intelligent systems
- Organizational theory
- Serious games
- Discrete probability
- Information theory
- Decision theory
- Cognitive systems
- Management theory
- Algorithmic strategies
- System and software quality
- Industrial informatics

This list of topics will be revised periodically to reflect the evolution of research and teaching at the School. The students will learn to:

- apply some course theories to their own research area;
- distinguish between different styles of Informatics theory, and different discipline approaches to constructing theory; and
- understand the role of theory in their own research work, including how to design a prototype theory appropriate for their research area.

4 Forms of Teaching

The teaching comprises lectures and seminars. Lecturers concentrate on delivery of Informatics theories, whereas seminars focus on analysis of the theories through group discussion, and article presentation.

The teaching is conducted in English.

5 Examination

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

Registration of examination results:

Name of examination	Credits	Grading
Assignments	7.5 hp/credits	U/G

6 Admission Requirements

The admission requirements of the course are general entry requirements for third-cycle courses and study programmes, i.e. a second-cycle qualification or satisfied requirements for courses comprising at least 240 credits of which at least 60 credits were awarded in the second cycle, or the equivalent.

In order to fulfil the specific entry requirements, the applicant must have completed academic courses of at least 60 credits , including independent thesis writing of at least 15 credits at advanced level, within the field Informatics, applicable areas of a similar kind or other fields which are judged as directly relevant for the licentiate or PhD thesis.

A further requirement is proof of skills in English equivalent of studies at upper secondary level in Sweden, known as English course B. This is normally demonstrated by means of an internationally recognized test, e g IELTS, TOEFL or the equivalent.

7 Third-cycle Subject Area

The course forms a part of the third-cycle subject area of Informatics at the University of Skövde.

8 Decision on the Course and Ratification of the Course syllabus

This course was approved by the Committee for the doctoral programme in informatics Dec 10, 2018. This course syllabus was ratified by the Committee for the doctoral programme in informatics Dec 10, 2018. It is valid from Jan 1, 2019.

9 Restrictions

This course cannot constitute a part of a degree also containing a course, the content of which is totally or partly equivalent to the content of this course.

10 Additional Information

Further information will be available on the university's website before a course is provided.

National and local regulations for higher education are available on the university's website.

During and after the course there will be a follow-up evaluation concerning the learning outcomes. The main objective of the follow-up is to contribute to improving the course. The research students' experience and points of view constitute one part of the scrutiny and are obtained through written group course evaluation/discussions. The research students are to be informed about the outcome of these as well as possible decisions concerning steps to be taken.

11 Course Literature and Other Educational Materials

The course literature consists of a set of chosen scientific articles and book chapters. A list of these are provided by the course director and are listed on the course home page for each time the course is given. These will normally include:

Gregor, S. 2006. The nature of theory in information systems. *MIS Quarterly*, 30, 611-642.

Holton, G. 1979. Constructing a theory: Einstein's model. *The American Scholar*, 309-340.

Lucas, J. W. 2003. Theory-testing, generalization, and the problem of external validity. *Sociological Theory*, 21, 236-253.

Winter, R. G. 2016. The structure of Scientific Theories. In: Zalta, E. N. (ed.) The *Stanford Encyclopedia of Philosophy*. Stanford University.