



**LUNDS UNIVERSITET**  
Lunds Tekniska Högskola

*Course syllabus*

## **Geografiska databaser** **Geographical Databases**

**EXTN70, 7,5 credits, A (Second Cycle)**

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED L

**Date of Decision:** 2023-04-20

### **General Information**

**Elective for:** L4-gi

**Language of instruction:** The course will be given in English

### **Aim**

The aim of the course is to provide a theoretical basis for how geographic databases are structured and how they can be used. Additionally, the course aims to provide practical skill in the modelling, creation, and use of such databases.

### **Learning outcomes**

*Knowledge and understanding*

For a passing grade the student must

- explain how a structured query language can be used to create relational databases as well as for implementing advanced queries
- describe how geographical data can be stored, and how they can be searched, in a database
- explain spatial indexation techniques
- analyze the advantages and disadvantages for storing geographical data in a database compared to a file system
- explain fundamental concepts in object oriented modelling
- explain spatio-temporal database methods
- describe concepts of open source and volunteered geographic information
- describe how object-oriented modelling can be used to describe the structure of a geographical database.

### *Competences and skills*

For a passing grade the student must

- independently create an object oriented model that describes the structure of a geographic database in a standardized modelling language
- be able to communicate with a database designed for geographic data.

### *Judgement and approach*

For a passing grade the student must

- take a critical stance to the structure of, and techniques for storing, geographic data.

## **Contents**

The course contains the central concepts and techniques for management of geographic databases. The areas covered in particular include spatial databases, object oriented modelling of the content of geographic databases, structure query language – SQL (as well as an extension of this language to handle spatially explicit queries), spatial indexing, spatio-temporal methods, open source and volunteered geographic information.

## **Examination details**

**Grading scale:** TH - (U,3,4,5) - (Fail, Three, Four, Five)

**Assessment:** Assessment takes the form of a written examination, and evaluation of project work. Approved on all exercises and participation on all compulsory activities.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

## **Admission**

**Admission requirements:**

- L: EXTF80 Geographical Information Technology and EDAA20 Programming and Databases; LTH: EDAA01 Programming - Secon Course

**The number of participants is limited to:** No

**The course overlaps following course/s:** GISN06, NGEN12

## **Reading list**

- Worboys, M. och Duckham, M: GIS: A computing perspective, 2nd edition. CRC Press, 2004, ISBN: 0-415-28375-2.
- Mansourian, A., and Harrie, L.: Lecture Notes in Geographical Databases. Department of Physical Geography and Ecosystem Science, Lund University, 2012.
- Articles and book chapters. Articles and book chapters that are distributed by the department.

## **Contact and other information**

**Course coordinator:** Zheng Duan, zheng.duan@nateko.lu.se

**Course administrator:** Karin Larsson, karin.larsson@nateko.lu.se

**Course homepage:** <http://www.nateko.lu.se/extn70>