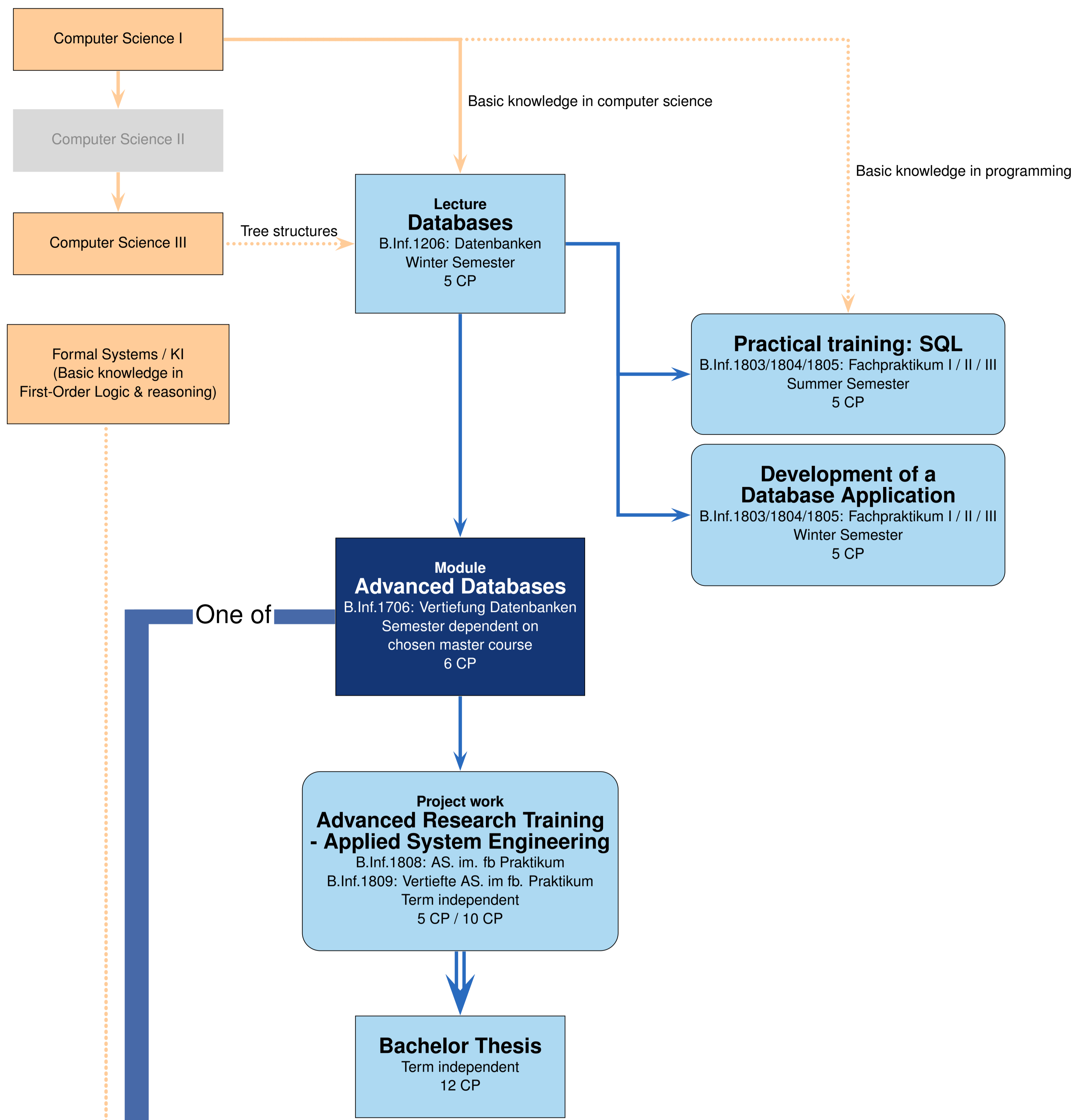


DATABASE & INFORMATION SYSTEMS GROUP: COURSES OVERVIEW

Databases & Information Systems Group · Institut für Informatik · Universität Göttingen · Germany
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BACHELOR



Databases

The module is an introductory course to (relational) databases and will cover the following topics:

- Conceptual modeling (ER model)
- Logical modeling: relational model
- Relational algebra (theoretical foundations for query languages)
- SQL queries
- Syntax of SQL DDL, DML: Updates
- Overview of database internals: physical storage, optimization, query evaluation
- Overview of multiuser aspects, transactions, safety
- Overview of formal database design/normalization

Practical training: SQL

In this lab course, the database programming language SQL is taught in several subsequent units. The course will cover topics amongst others like referential integrity, indexing, access control and embedding a database into Java code. The practical training is carried out in groups consisting of 3 or 4 students. For every exercise, the presentation of the solutions is done for each group with their supervisor.

Development of a Database Application

In this lab course, students should develop a real-world database application: E.g. a university database which has partly the functionality of UniVz and FlexNow. Besides the mandatory database, it is up to the students to decide on which aspects of the application they want to focus on. The course aims to simulate a realistic Application development and to familiarize with new techniques.

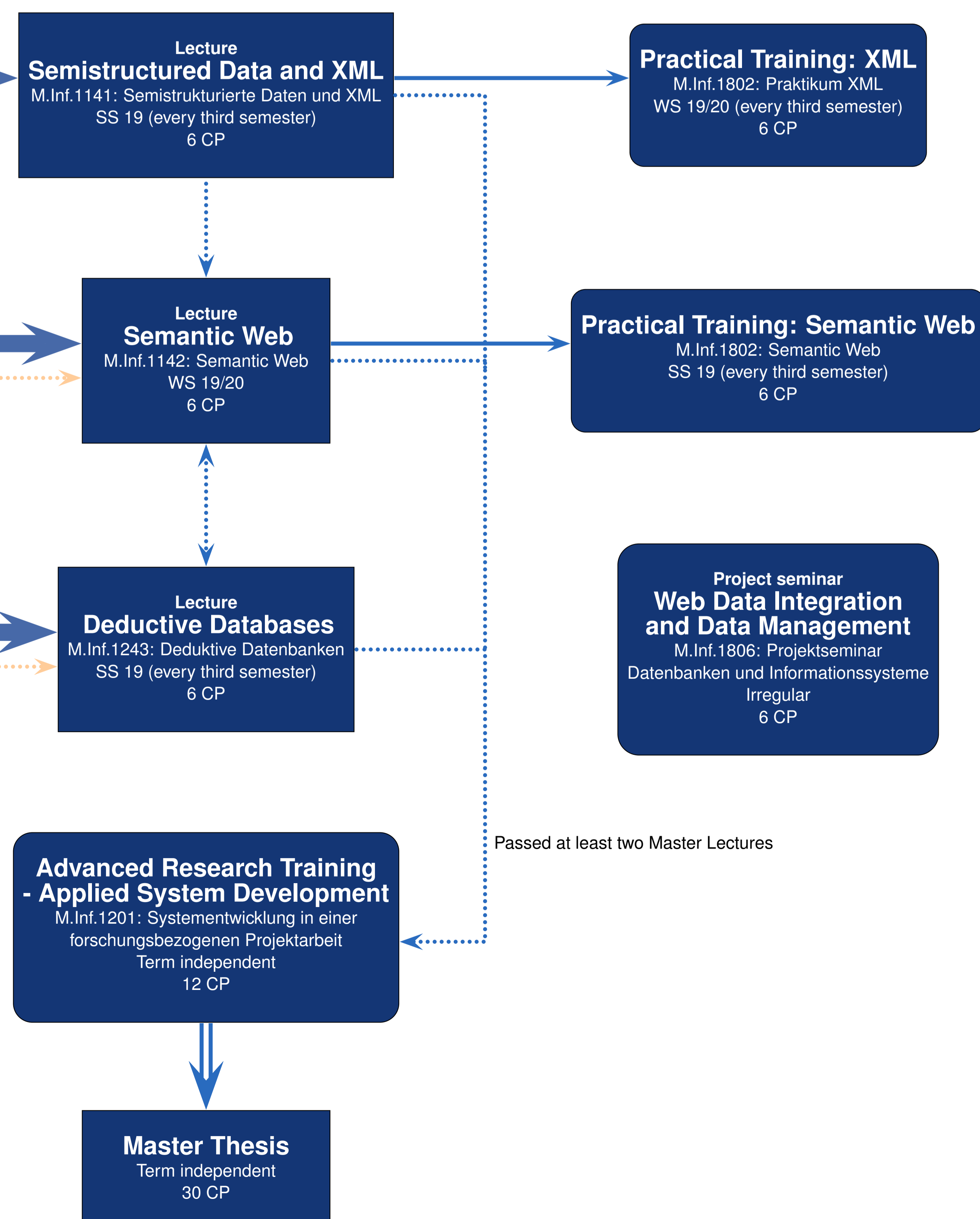
Advanced Databases

The Advanced Database module gives the student the possibility to include a Master degree database lecture (Semistructured Data and XML, Deductive Databases or Semantic Web) in the Bachelor degree. Note that these lectures are on a three semester cycle and will require a basic understanding of First-Order Logic and reasoning that are taught in the 'Formal Systems' module.

Advanced Research Training

For the Advanced Research Training the student will be assigned a project that is related to our current research. This project will give her/him the opportunity to become acquainted with a more in-depth topic in a database research field. Thus it is highly recommended to do this project work as a preparation for a potential Bachelor thesis. Please contact us if you are interested.

MASTER



Semistructured Data and XML

The course introduces the general concepts of semistructured data and their evolution to XML. XML and the main languages and concepts of the XML world are then investigated both in theory and practice.

- early data models and database concepts (network data model, object-oriented model)
- semistructured data (data integration, metadata handling, data models and languages)
- the XML data model and language, DTDs; XHTML
- the addressing formalism XPath
- the query language XQuery
- the transformation language XSLT
- XML Schema, XLink, DOM/SAX, XML Databases/Mappings

Practical Training: XML

In this training, concepts around XML are taught in several subsequent units: XML, DTD, XPath/XQuery, XSLT, XML Schema, DOM, JAXB, SAX/StAX, SQLX. The practical training is carried out in groups consisting of 3 or 4 students. For every exercise, the presentation of the solutions is done for each group with their supervisor.

Deductive Databases

The course introduces theoretical/logical aspects of databases and applies them to deductive databases.

- The first-order-logic-based twin to the relational algebra: Relational Calculus
- Reasoning: First-Order Model Theory, Resolution Calculus
- Deductive Databases - Positive Recursive Datalog
- Advanced Datalog: Datalog with Negation, Well-Founded Semantics, Disjunction, Stable Semantics

Semantic Web

The course introduces the underlying concepts of the Semantic Web:

- RDF: N3 and RDF/XML format, semantics
- SPARQL: the query language for RDF data
- RDFS, OWL: having RDF data with additional reasoning
- Description Logics: the logic underlying OWL
- Practical experiments with RDF, Jena, Reasoners etc.

Practical Training: SemWeb

In this training, concepts around Semantic Web Technologies are taught in several subsequent units: SPARQL, Jena, RDF4J, OwlOntology, Hermite, Protégé, Ontology construction and usage and Linked Open Data. The practical training is carried out in groups consisting of 3 or 4 students. For every exercise, the presentation of the solutions is done for each group with their supervisor.

Web Data Integration and Data Management

In this project seminar the students have a choice between a selection of recent research papers. The aim of the seminar is that the students will then prepare a talk on the basis of the selected paper's topic, which will be further discussed with the other participants. Most topics will involve a tool that the participants are expected to familiarize themselves with and test out the functionality and limitations.

Advanced Research Training

For the Advanced Research Training the student will be assigned a project that is related to our current research. This project will give her/him the opportunity to become acquainted with a more in-depth topic in a database research field. Thus it is highly recommended to do this project work as a preparation for a potential Master thesis. Please contact us if you are interested.