

Course Schedule

Fridays, 13:30 -16:20, 113 RB

Weekly Course outline

| Weeks | Topics | Pre-study |
|----------|---|--|
| 1. Week | Course Review | |
| 2. Week | Review of Popular DBMS Alternatives including cloud based Database as a Service MySQL Installation on a PC | Lecture Notes & Preliminary Work |
| 3. Week | Relational Database Design and Normalization | Lecture Notes & Preliminary Work |
| 4. Week | A Very Simple Database Application with Java and MySQL | Lecture Notes & Preliminary Work |
| 5. Week | Relational Algebra | Lecture Notes & Preliminary Work |
| 6. Week | SQL Queries in a Single Table Operators and Functions Further Use of SQL Queries in JDBC | Lecture Notes & Preliminary Work |
| 7. Week | Joins and Sub-queries Views and Indexes (not to be included in the mid-term exam). | Lecture Notes & Preliminary Work Homework Assignment #1 |
| 8. Week | Midterm Exam (tentative) | |
| 9. Week | Backup and Recovery Methods to Ensure Data Quality | Lecture Notes & Preliminary Work |
| 10. Week | Designing a Simple Database Backed Application Problems with Relational Database Use | Lecture Notes & Preliminary Work Homework Assignment #2 |
| 11. Week | CAP Theorem and No-SQL Databases, | Lecture Notes |
| 12. Week | Using Redis Key-Value Store with Java | Lecture Notes |
| 13. Week | Using MongoDB Document Database with Java | Lecture Notes |
| 14. Week | Project Presentations | Project Delivery |

Assessment methods

| Course Activities | Number | Percentage % |
|--|-----------|--------------|
| Attendance (mandatory after add-drop period) | 12 | 10 |
| Weekly Preliminary Work | 8 | 20 |
| Assignments | 2 | 20 |
| Projects | 1 | 30 |
| Midterm Exam (Written with open ended questions) | 1 | 20 |
| | | |
| Total | 24 | 100 |
| Percentage of semester activities contributing grade success | 24 | 100 |
| Percentage of final exam contributing grade success | | |
| Total | 24 | 100 |

Attendance: Attendance after add-drop period is mandatory. Students are required to attend at least %70 of classes. Typical excuses such as health reports should be communicated with the instructor.

Use of Github: All student work except in-class exams will be submitted through Github. Use of Github is a modern, widely used and well documented way to share code and datasets. It also allows easy tracking of source code, including finding out where it has been copied and pasted from. Therefore ECON majors are expected to be able to use it. **As Github use is mandatory, all work submitted in other ways will be automatically disqualified and graded as zero.**

Preliminary Homeworks: Students are required to complete simple preliminary homeworks and submit them through Github. These homeworks will contribute toward a major part of their learning and also to their grade.

Use of SQL and MariaDB: Course discussions are based on ANSI standard SQL, but will in many times involve examples using MariaDB which is one of the most popular database management systems in the world. Most if not all homeworks will require use of SQL statements, and some coursework including in-class exams will test students' experience with actual DBMS systems such as MariaDB. As MariaDB is free software, students have no license limitations to install it to their own computers.

Use of "Free-Tier" Cloud Services: Many cloud service providers such as Amazon or Google provide no-cost limited capacity use of their resources. There are also particular programs aimed at students. This course encourages use of such "free-tier" cloud services in order to deploy DBMS and test SQL statements on a cloud-deployed DBMS.

Use of Programming Languages: Course discussions are language-independent. Assignments can be submitted using any typical programming language such as Python, Java or C++. Students are expected to have a fundamental understanding of the language they submit their homeworks in.

Use of Third Party Code Examples and Tutorials: Most, if not all, of class homeworks will require students to use programming libraries. These libraries are in all cases well documented and there are several online examples and tutorials for these libraries. In case a student finds useful code snippets, and simply copies and pastes the code, this is allowed. However, students are **required to give a reference** to the example or tutorial they have used inside the code, as a comment.

Use of ChatGPT and Similar LLM Tools: Use of AI tools in preliminary work, homeworks and final project is **allowed**, as long as **students report how these tools have been used** (questions asked and answers gotten, problems with answers, how students modified AI output in their work, etc.)

Course Category: Major Area Course

Workload and ECTS Calculation

| Activities | Number | Duration (Hours) | Total Work Load |
|---|--------|------------------|-----------------|
| Course Duration (Including Exam Week: 16 x Total Hours) | 15 | 3 | 45 |
| Laboratory | | | |
| Application | | | |
| Specific practical training (if any) | | | |
| Field Activities | | | |
| Study Hours Out of Class (Preliminary work, reinforcement, etc) | 14 | 3,5 | 49 |
| Presentation / Seminar Preparation | | | |
| Projects | 1 | 25 | 25 |
| Homework assignment | 2 | 10 | 20 |
| Midterms (Study duration) | 1 | 20 | 20 |
| Final (Study duration) | | | |
| Total Workload | | | 161 |

Matrix of the Course Learning Outcomes Versus Program Outcomes

| Program Outcomes | Contribution Level* | | | | |
|--|---------------------|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| 1 Deepen and develop advanced level and current knowledge in economics to an expert level based on the competencies of the economics education and acquire the skills make original thoughts, views, and contributions to science. | | | | | x |
| 2 To comprehend the interaction between economics and related fields; to achieve original results by using expert knowledge in analysis, and evaluation of new and complex ideas. | | | | | x |
| 3 To acquire high level skills in applied methods in economics and to be able to systematically follow new theoretical developments in applied economics. | | | | | x |
| 4 To be able to apply existing techniques to an original research idea. | | | | | x |
| 5 To find a new scientific method. | | | | | x |
| 6 To broaden the knowledge of economics by publishing scientific articles related to economics in national or international refereed journals and to publish these articles in a scientific ethical way. | | | | | x |
| 7 To be able to identify, participate in, organize and lead activities, such as panels, workshops and conferences, that aim to develop solutions for novel and interdisciplinary problems. | | | x | | |
| 8 To follow pioneering and innovative theories and methods in economics, to be able to use them in analysis and research and to be able to contribute to the process of becoming an information society. | | | | | x |
| 9 To be able to analyze the relationships and processes in economics and to develop functional and effective communication networks. | | | x | | |
| 10 To make some scientific contributions to projects aiming to increase the productivity in business. | | | | | x |
| 11 To be able to share his/her work and to criticize works of others by using academic networks in economics efficiently. | | | | | x |

1: Lowest, 2: Low, 3: Average, 4: High, 5: Highest