

General Information:

Name of Course:	DATABASE SYSTEMS
Course Code:	IVM437ANMI
Semester:	2 th
Number of Credits:	4
Allotment of Hours per Week:	2 Lectures+2 practical classes /Week
Assessment (Evaluation):	Exam
Prerequisites:	-

Instructor: **Dr Etelka SZENDRŐI**
Office: 7624 Hungary, Pécs, Boszorkány u. 2. Office N° B-215
E-mail: szendroi@mik.pte.hu
Office Phone: +36 72 503650 /23639

Introduction, Learning Outcomes:

The focus of this course is Database architectures, logical layers, tasks implemented in layers. Implementation of special data structures in a relational data model. Geometric and geographic data storage and management. Optimize queries. Object relational frameworks. ADO.NET, Entity Framework. Web technologies and database systems. Data access in multi-tier applications. Web services. Design of distributed database systems. Replication of data. Business intelligence (data warehouse concept, design, OLAP). Big Data. NoSQL.

General Course Description and Main Content:

Students will learn to

1. Database Architectures
2. Create and modify Stored procedures, triggers
3. Writing User defined functions
4. Data Analysis with SQL and EXCEL
5. Transaction processing
 - a. Understanding Locks and Concurrency
 - b. Setting isolation levels
6. Standards of data connections: ODBC, ADO, OLEDB, ADO.NET.
7. Database programming in C# language using ADO.NET Entity Framework (two- and three-tier data access models)
8. Business Intelligent, data warehouses.
9. NoSQL, Big Data.

Methodology:

- **Lectures:**
- **Practices**
- Home works
- Students' Presentation

Schedule:

The rough outline of the schedule is as follows:

Week 1-4: Database architectures. Data manipulation.

- Sql scripts, stored procedures.
- User Defined functions
- Triggers
- Transactions
- Query optimization
- Data Analysis with SQL and EXCEL

Week 5-8 Create programs in C# with using ADO.NET classes

- ADO.NET Connected model, Disconnected model
- LINQ, Programming Entity Framework
- Entity Framework in Web applications
- Entity Framework Core and ASP.NET MVC

Week 9: **Midterm Test**

Week 10: **Spring holiday**

Week 11 Distributed systems

Week 12-14 Business Intelligent, Data warehouses

Week 15: Student Presentations

Timetable of the Exams in Examination time period:

20th of May 10 am;
26th of May 10 am;
1th of June 10 am.

Attendance:

Attendance is required at each lectures and practices. Unjustified absences will affect the rating. The student's final grade will fail, if the student's absence is more than 30% of the total number of lessons. Arriving to the class in time and staying until the end of the scheduled lesson is considered required. Being late of more than 15 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid justify, such as a doctor's note.

Grading:

In order to receive signature for the course, the student:

- must pass the midterm test
- keep a presentation on one of the topics in curriculum (NoSQL, Big Data, BI)
- student must be present at the 70% of lessons

All tests and exams are closed book and closed-notes. A student with a proper reason of being absent from the exam must inform and get a permission from the teacher prior to the time of test. Any students who does not take the test at the scheduled time will receive a zero score.

Grading Scale:

Numeric Grade:	5	4	3	2	1
Evaluation in percent:	89%-100%	77%-88%	66%-76%	55%-65%	0-54%

The Final grade of the Course is the combination of midterm test (35%), the Presentation (15%) and Exam score (50%). Calculation of the Final grade of the course is described with the next formula: $0,35 \cdot \text{midterm test} + 0,15 \cdot \text{presentation} + 0,5 \cdot \text{Exam score}$ in Examination time period.

Students with Special Needs:

Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

Readings and Reference Materials:

1. Kathi Kellenberger and Scott Shaw, *Beginning T-SQL*, Third Edition, Apress, 2014, ISBN: 978-1-4842-0047-6
2. John Paul Mueller, *Microsoft ADO.NET Entity Framework Step by Step*, O'Reilly Media, Inc., 2013
3. Tim Patrick, *Microsoft® ADO.NET 4 Step by Step*, O'Reilly Media, Inc., 2010
4. Thomas M. Connolly, Carolyn E. Begg: *Database Systems, A Practical Approach to Design, Implementation, and Management*, Pearson, 2015, ISBN 10: 1-292-06118-9
5. Wayne L. Winston, *Microsoft Excel 2016 Data Analysis and Business Modeling*, Microsoft Press, 2016, ISBN: 978-1-5093-0421-9
6. Guy Harrison, *Next Generation Databases, NoSQL, NewSQL, and Big Data*, Apress, 2015, ISBN: 978-1-4842-1330-8
7. Adam Freeman, *Pro ASP.NET Core 3*, Eighth edition, Apress, 2020, ISBN: 978-1-4842-5440-0
<http://docs.microsoft.com>

Lectures and practice materials in Meet Street of Neptun Education System.