COURSE SYLLABUS AND COURSE REQUIREMENTS ACADEMIC YEAR 2022/2023 SEMESTER II.

Course title	DATABASE SYSTEMS
Course Code	IVM437ANMI
Hours/Week: le/pr/lab	2/2
Credits	4
Degree Programme	Computer Science Engineering MSC
Study Mode	full time
Requirements	exam
Teaching Period	Spring
Prerequisites	
Department(s)	System and Software Technology
Course Director	Etelka Szendrői Dr. (PhD)
Teaching Staff	Etelka Szendrői Dr. (PhD)

COURSE DESCRIPTION

Application architectures, logical layers, tasks implemented in layers. Physical layers, data access model through layers, multi-layer architectures. Database connection standards: ODBC, ADO, OLEDB, ADO.NET. Developing ADO.NET Entity Framework Core applications in C#. Database models-NOSQL. Big Data. Decision support-Business intelligence. Data warehouses. Foundations of the Microsoft Power BI platform.

SYLLABUS

1. GOALS AND OBJECTIVES

Providing theoretical and practical knowledge about various database architectures, developing database-based applications, building data connections. Transfer of basic knowledge in the field of Big Data, Business Intelligence, Data Warehouses, creation of data warehouse models, data analysis. The purpose of the course is also to introduce the basics of the Microsoft Power BI platform and to present and try out its possibilities in a practical way.

2. COURSE CONTENT

	TOPICS
LECTURE AND	1. Database systems. Data-driven applications. Multi-tier application architecture, the task of
PRACTICE	each layer. Accessing data sources from applications. Creating data connections (ODBC, OLEDB, ADO.NET). ADO.NET Entity Framework and ADO.NET Entity Framework Core technology. LINQ basics. Solving tasks in the C# programming language, using EF Core and LINQ.
	 Decision support - Business intelligence. Big Data. Database models (NoSQL). Data warehouses. Data warehouse models. Dimensional modeling. Dimension and fact tables. Impact of data changes on the data warehouse. ETL. Microsoft Power BI platform basics. Analyse data in the Power BI platform.

TODICC

DETAILED SYLLABUS AND COURSE SCHEDULE

LECTURE AND PRACTICE

week	Торіс	Compulsory reading; page number (from to)	Required tasks (assignments, tests, etc.)	Completion date, due date
1.	Orientation. Requirements. Introduction. Review of Database basic knowledge.			
2.	Database systems. Data-driven applications. Multi-tier architecture. Access data sources from C# applications. Data connections (ODBC, OLE, ADO.NET) Entity Framework			
3.	Application of Entity Framework Core technology. LINQ queries. Solving tasks.			
4.	Application of Entity Framework Core technology. Migration. CRUD operations.			
5.	ASP.NET Core and Entity Framework Core			
6.	Decision support. Business Intelligence. Big Data. Various data models (NOSQL, etc.)			
7.	Data Warehouses. Dimensional models. Fact and dimensional tables. Data modification in the Data Warehouse.		Each student chooses a topic for the last week's lecture, which he/she must present.	Last week's lecture.
8.	Midterm Test . ETL processes. Transfer data from various sources.		Midterm Test.	On the Lecture.
9.	ACADEMIC HOLIDAY			
10.	POLLACK EXPO			
11.	Creating a Data Warehouse.			
12.	Fundamentals of Microsoft Power BI Platform.			
13.	Microsoft Power BI modules.			
14.	Microsoft Power BI data analyses.			
15.	Students' presentations			

3. ASSESSMENT AND EVALUATION

ATTENDANCE

In accordance with the Code of Studies and Examinations of the University of Pécs, Article 45 (2) and Annex 9. (Article 3) a student may be refused a grade or qualification in the given full-time course if the number of class absences exceeds 30% of the contact hours stipulated in the course description.

Method for monitoring attendance (e.g.: attendance sheet / online test/ register, etc.) attendance sheet

Course-unit with final examination

Mid-term assessments, performance evaluation and their weighting as a pre-requisite for taking the final exam

Туре	Assessment	Weighting as a proportion of the pre-requisite for taking the exam
Midterm Test	max. 100 %	50 %
Student's presentation	max. 15 points (100 %)	50 %

Requirements for the end-of-semester signature

Participation in classes in accordance with the regulation of TVSZ. Writing the midterm test and making a presentation. The weighted average of the midterm test and the presentation should be minimum 40 %. (0.5^* Midterm test % + 0.5^* Presentation % >=40%).

Re-takes for the end-of-semester signature (PTE TVSz 50§(2))

Retake of midterm test in the first week of the examination period.

Type of examination (written, oral): written exam

The exam is successful if the result is minimum 40 %.

Calculation of the grade (TVSz 47§ (3))

The mid-term performance accounts for **50** %, the performance at the exam accounts for **50** % in the calculation of the final grade.

Calculation of the final grade based on aggregate performance in percentage.

Course grade	Performance in %
excellent (5)	85 %
good (4)	70 % 85 %
satisfactory (3)	55 % 70 %
pass (2)	40 % 55 %
fail (1)	below 40 %

The lower limit given at each grade belongs to that grade.

4. SPECIFIED LITERATURE

COMPULSORY READING AND AVAILABILITY

[1.] The lectures' and practices' materials (pdf files) in the Neptun Meet Street.

[2.] Derek J. Rouleau, Beginning Entity Framework Core 2.0, 2018, Apress, ISBN: 978-1-4842-3374-0

[3.] Eric Redmond, Jim R. Wilson, Seven Databases in Seven Weeks, The Pragmatic Programmers, LLC, 2012

RECOMMENDED LITERATURE AND AVAILABILITY

[4.] Joe Celko's, Complete Guide to NoSQL, Morgan Kaufmann, 2014

[5] Mitchell Pearson, Brian Knight, Devin Knight, Manuel Quintana, *Pro Microsoft Power Platform*, Apress, 2020, ISBN 978-1-4842-6007-4