UNIVERSITY OF MISKOLC
FACULTY OF **EARTH SCIENCE AND ENGINEERING**
1735

COMPUTER APPLICATIONS II.
MSc in Petroleum Engineering **MFKOT720021**

COURSE DESCRIPTION

Miskolc University
Faculty of Earth Science and Engineering
Institute of Petroleum and Natural Gas

Miskolc, 2022/2023 I. félév / Semester

Course Data Sheet

Course Title: Computer Applications II. **Instructor:** Dr. László KIS, senior lecturer	**Code:** MFKOT720021 **Responsible department/institute:** DPE/IPNG (OMTSZ/KFGI)
	Course Element: Compulsory
Position in curriculum* **(which semester):** 1 (2)	**Pre-requisites (if any):** no
No. of contact hours per week (lecture + seminar): 0+3	**Type of Assessment (examination / practical mark / other):** practical mark
Credits: 3	**Course:** full time

Course Description:
1. Database management using Microsoft Access: user interface, elements of databases, relational databases.
2. Creation of queries and reports.
3. Database maintenance.
4. General descriptions of CAD programs.
5. Creation of simple engineering drawings using AutoCAD: user interface
6. Creation of simple engineering drawings using AutoCAD: drawings up to scale
7. Creation of simple engineering drawings using AutoCAD: drawing elements.
8. Three-dimensional drawings.
9. General descriptions of mathematical programs.
10. Usage of MathCAD program: simple calculations.
11. Usage of MathCAD program: graphics, matrix operations,
12. Usage of MathCAD program: processing and analyzing measured data,
13. Usage of MathCAD program: programming,
14. Usage of MathCAD program: integral and differential calculations

Competencies to evolve:
Knowledge: T1, T8, T11
Ability: K1, K4, K5, K6, K7, K8, K11
Attitude:
Autonomy and responsibility:

Assessment and grading:		Grading scale:	
Students will be assessed with using the following elements.		% value	Grade
Attendance:	5 %	90 -100%	5 (excellent)
Homework	20 %	80 – 89%	4 (good)
Midterm exam	30 %		3
Final exam	45 %	70 - 79%	(satisfactory)
Total	100%		
		60 - 69%	2 (pass)
		0 - 59%	1 (failed)

Compulsory or recommended literature resources:
- User manual of Microsoft Excel
- User manual of Visual Basic
- User manual of Microsoft Access

- User manual of the AutoCad
- User manual of MathCad

Course Schedule for 2020/21 school year

Date	Topic
9/7/2022	Database management using Microsoft Access: user interface, elements of databases, relational databases.
9/14/2022	Creation of queries and reports.
9/21/2022	Break
9/28/2022	General descriptions of CAD programs.
10/5/2022	Creation of simple engineering drawings using AutoCAD: user interface
10/12/2022	Creation of simple engineering drawings using AutoCAD: drawings up to scale Creation of simple engineering drawings using AutoCAD: drawing elements.
10/19/2022	Test writing.
10/26/2022	Three-dimensional drawings.
11/2/2022	Break
11/9/2022	Usage of MathCAD program: simple calculations.
11/16/2022	Usage of MathCAD program: graphics, matrix operations,
11/23/2022	Usage of MathCAD program: processing and analyzing measured data,
11/30/2022	Usage of MathCAD program: programming, Usage of MathCAD program: integral and differential calculations
12/7/2022	Test writing.

Test Example

Test 1 (1) 60 points total

1. Find the real solutions of the following system of equations. Use 5 decimal places precision.

    $8x+3y+z=9,12$ $-2x^2+y-2z=-8,34$ $3x-8z+2y^2=-28,74$ (9p+3p)

2. Find the first 5 roots of the following function, which are greater than 7. Use 4 decimal places. Plot the function with a green continuous line in the [0; 20] interval.

    $$Cos(2.1*x)*1.22*x^2+2.55*x$$ (5p+2p+3p)

3. Create a 20*20 matrix where every cell must have the row number plus the column number in it.   (8p)

4. Create a graph and create the following objects:

    A line defined by: $1.47*y+-1.57*x+0.36=0$ (blue continuous line)
    A circle defined by: $(y-1.75)^2+(x-6.73)^2=30,36$ (thick red continuous line)
    A circle with center of (0.96; 1.25) and diameter of 5.1   (thick green dashed line)
                                                                (3p+4p+4p)
    Find all intersections (with x and y coordinates, 6 decimals).   (6p)
    Find the area between the line and the first circle (5 decimals).   (3p)
    Find the area between the two circles. (If they intersect)   (1p)

5. Fit a linear function on the following points: (1; 4.6), (2; 5.8), (3; 10.2), (4; 15.9), (7; 25.8), (10; 35.2). Plot the points and the function. Give the equation of the fitted line (6 decimals).
                                                                (5p+3p+2p)

Examination review questions

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