



SURFER FOR WINDOWS HANDS ON TRAINING

Hydrogeological Engineering MSc mesterszak

2017/18 II. félév

TANTÁRGYI KOMMUNIKÁCIÓS DOSSZIÉ

Miskolci Egyetem
Műszaki Földtudományi Kar
Környezetgazdálkodási Intézet

Tartalomjegyzék

1. Tantárgyleírás, tárgyjegyző, óraszám, kreditérték
2. Tantárgytematika (óraóra lebontva)
3. Minta zárthelyi
4. Vizsga tételsor

1. Tantárgyleírás, tárgyjegyző, óraszám, kreditérték

<p>Course title: Surfer for windows hands on training Instructor: Dr. Mikita Viktória, assistant professor</p>	<p>Code: <i>MFKHT73005</i> Responsible department/institute: Hidrogeológiai-Mérnökgeológiai Intézeti Tanszék/ Környezetgazdálkodási Intézet Type of course: optional</p>																						
<p>Position in curriculum (which semester): 6</p>	<p>Pre-requisites (if any): no</p>																						
<p>No. of contact hours per week (lecture + seminar): 2+1</p>	<p>Type of Assessment (examination/ practical mark / other): exam</p>																						
<p>Credits: 3</p>	<p>Course: full time</p>																						
<p>Course description The students will be able to use the most common practical applications of the Surfer for Windows software. They will able to solve some engineering tasks related to area and volume integral problems they can edit various maps and perform data processing tasks.</p> <p>The short curriculum of the object:</p> <ul style="list-style-type: none"> - The theoretical background of grid files, - Introduction to interpolation algorithms - Math with grid files (on 2 occasions), - Volume calculations - 2D mapping techniques: base maps, contour maps, post maps, vector maps (on 2 occasions) - 2.5 D spatial mapping techniques: 3D wireframe, surface and watershed maps (on 2 occasions) - Data transfer to Processing MODFLOW <p>Competencies to evolve: Knowledge: T4, T5, T6, T7, T10, T12 Ability: K1, K2, K3, K4, K5, K13 Attitude: A1, A2 Autonomy and responsibility: F1, F3</p>																							
<p>Assessment and grading: Students will be assessed with using the following elements.</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Attendance:</td> <td style="text-align: right;">15 %</td> </tr> <tr> <td>Short quizzes</td> <td style="text-align: right;">10 %</td> </tr> <tr> <td>Midterm exam</td> <td style="text-align: right;">40 %</td> </tr> <tr> <td>Final exam</td> <td style="text-align: right;">35 %</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">100%</td> </tr> </table> <p>Grading scale:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">% value</th> <th style="text-align: left;">Grade</th> </tr> </thead> <tbody> <tr> <td>90 -100%</td> <td>5 (excellent)</td> </tr> <tr> <td>80 – 89%</td> <td>4 (good)</td> </tr> <tr> <td>70 - 79%</td> <td>3 (satisfactory)</td> </tr> <tr> <td>60 - 69%</td> <td>2 (pass)</td> </tr> <tr> <td>0 - 59%</td> <td>1 (failed)</td> </tr> </tbody> </table>		Attendance:	15 %	Short quizzes	10 %	Midterm exam	40 %	Final exam	35 %	Total	100%	% value	Grade	90 -100%	5 (excellent)	80 – 89%	4 (good)	70 - 79%	3 (satisfactory)	60 - 69%	2 (pass)	0 - 59%	1 (failed)
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Compulsory and recommended literature resources:

Surfer 12 Users Guide, Golden Software Inc., 2014. Denver.

Hamilton, D.E.-Jones, T.A.: Computer modeling of geological surfaces and volumes. - AAPG Computer applications in geology. No.1. p589. Tulsa, Oklahoma

Chiang, W-H. – Kinzelbach, W.(2001): 3D-Groundwater Modeling with PMWIN, A Simulation System for Modeling Groundwater Flow and Pollution, Springer-Verlag Berlin, Heidelberg, New York, ISBN 3-540-67744-5, SPIN 10774334

Kinzelbach, W. (1986): Groundwater Modelling (An Introduction with Sample Programs in BASIC), Elsevier, p.331.

Anderson, M. P. and W. W. Woessner, 1991. Applied groundwater modeling: simulation of flow and advective transport. 381 pp. Academic Press, San Diego, CA

2. TANTÁRGY TEMATIKA

Surfer for Windows hands on training
Tantárgytematika (ÜTEMTERV)
Aktuális tanév tavaszi félév
Hydrogeological Engineering MSc, 2. félév, törzsanyag tárgy

Hét	Előadás
1.	Introduction
2.	The basics of Surfer for windows software
3.	Theory of grid files- interpolation techniques
4.	Create simple line drawings
5.	Simple mathematical operations with grid files
6.	2D mapping techniques, contour maps
7.	3D mapping techniques, 3D surfaces
8.	Data transfer to Processing Modflow
9.	Grid operations, volume calculations
10.	Bányász sportnap (oktatási szünet)
11.	Surfer specific features (Slope, Watershed)
12.	Classroom task
13.	Midterm exam 1
14.	Additional midterm exam 1

3) MIDTERM EXAM SAMPLE

Surfer for windows hands on training c. course midterm exam

1. subtask (6 point)

From the given data (*DEM.dat*, *waterlevel.dat*, *bottom.dat*) create the surface contour map, the waterlevel distribution map and the bottom of the aquifer.

2. subtask (2 point)

Create a 2 classes-classified post map from the *borrow.dat* file.

3. subtask (3 point)

Make the dissolved chloride contamination distribution map in the area from the *chloride.dat* file, highlighted the 250 mg/l isoline.

4. subtask (5 point)

Determine the amount of contamination at the investigated area! The missing information (etc. porosity) are up to you.

5. subtask (4 point)

Determine the size of the contaminated area below 1000 mg/l contamination, and above 3000 mg/l chloride.

Grading:

excellent (5): 18-20

good (4): 16-17.5

satisfactory (3): 14-15.5

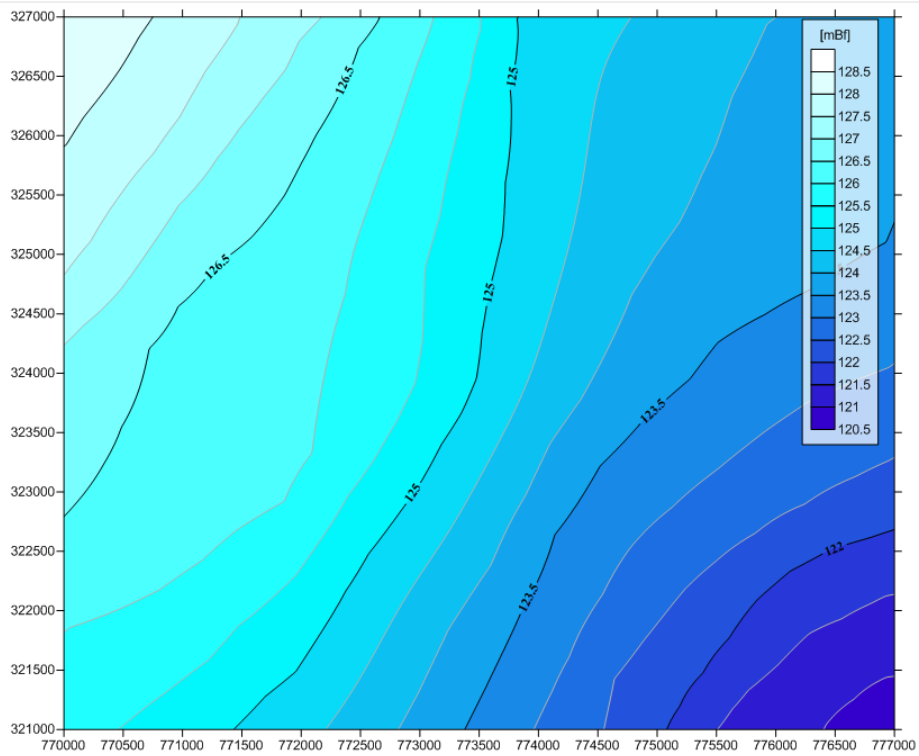
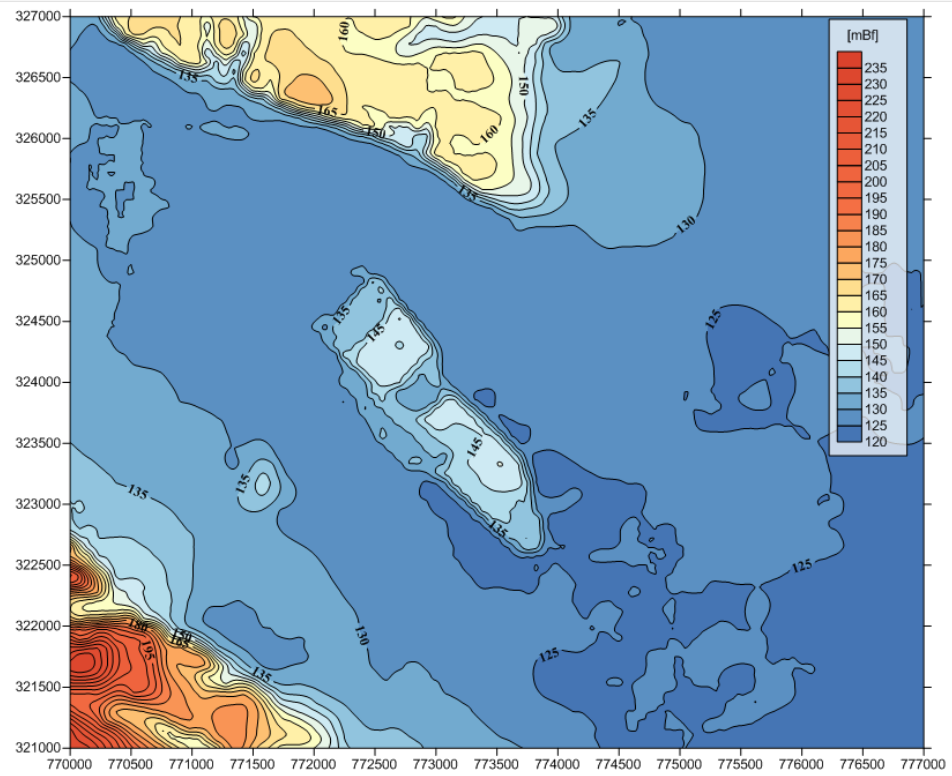
passed (2): 12-13,5

failed (1): 0-11.5

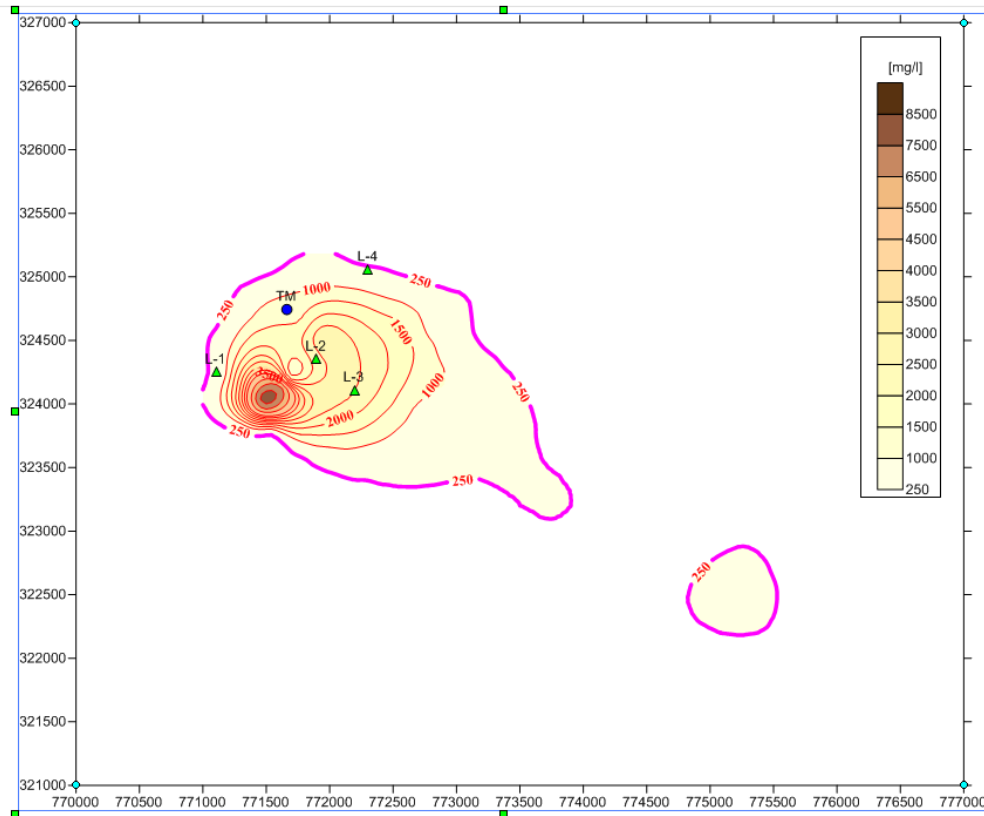
Surfer for windows hands on training midterm exam

The exam contains digital files!

1. subtask



2-3. subtask



4. subtask

Calculation of the amount of contamination:

$$M = \int c \cdot h_0 \cdot n_0 \cdot dx dy$$

$$M = 7270 \text{ kg}$$

5. subtask

size of the area above 3000 mg/l: 208.985 m²
size of the area below 1000 mg/l: 1.973.100 m²

5. OTHER REQUIREMENTS

During the exams using of mobile phone, smart devices, notes or copies of books are not acceptable. Violation of the examination order entails the suspension and completion of the writing of the exam.