

## Tárgytematika / Course Description

### Operations of Machines

GKNB\_MGTA004

Tárgyfelelős neve /

Teacher's name: Hadas-Rapi Ádám

Félév / Semester: 2021/22/2

Beszámolási forma /

Assesment: Folyamatos számonkérés

Tárgy heti óraszám /

Teaching hours(week): 2/2/0

Tárgy féléves óraszám /

Teaching hours(sem.): 0/0/0

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### OKTATÁS CÉLJA / AIM OF THE COURSE

Based on the previously acquired Thermo- and Hydrodynamics knowledge, students learn the basic principles of the operation of the most important heat and flow engineering machines and equipments used in the energy industry or in manufacture, their basic operating characteristics and the basic calculations of their energy consumption or energy production.

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### TANTÁRGY TARTALMA / DESCRIPTION

**This is an exam course, there are no contact lecture.**

Planned scheduling

- 1<sup>st</sup> week - Power and efficiency. Losses in machine operation. Efficiency and load.
- 2<sup>nd</sup> week - Operation of machines from start to stop. Diagram of the motion. Multi-stage startup.
- 3<sup>rd</sup> week - The characteristic curve of the machine is the operating point, the control of its operation and its loss.
- 4<sup>th</sup> week - Pumps and fans.
- 5<sup>th</sup> week - Water- and Wind Turbines.
- 6<sup>th</sup> week - Positive Displacement Compressors.
- 7<sup>th</sup> week - Heat Exchangers.
- 8<sup>th</sup> week - Chaloric machines.
- 9<sup>th</sup> week - Gas turbinas.
- 10<sup>th</sup> week - Refrigerators and Heat Pumps.
- 11<sup>th</sup> week - Principals of Ventilating- and Air-Conditioning Systems, HVAC.
- 12<sup>th</sup> week - Electricity generation.

Retake Test

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## SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESSMENT'S METHOD

Assessment methods

### 1. Trail tests

The students can be practise to the exam with trail test. This test will be available in the SzE-Learning site ([www.szelearning.sze.hu](http://www.szelearning.sze.hu)) during the semester with unlimited times.

- 1<sup>st</sup> trail test: 21/2/2022 (Monday) 8:00 AM
- 2<sup>nd</sup> trail test: 21/3/2022 (Monday) 8:00 AM
- 3<sup>rd</sup> trail test: 25/4/2021 (Monday) 8:00 AM

### 2. Assignments

During the semester, three consecutive assignments can be resolved and submitted in due time:

Assignment 1: Analysis of the movement state of a railway vehicle from start to stop (code:OPM\_AS\_01)

Assignment 2: Selection of centrifugal pump (code:OPM\_AS\_02)

Assignment 3: Dimensioning a two-stage compressor (code:OPM\_AS\_03)

The deadlines is on the SzE-Learning site.

The description of the tasks and further available documents needed to solution can be found on [szelearning.sze.hu](http://szelearning.sze.hu) with the given code of the specific assignment.

The completed task must be uploaded on the [szelearning.sze.hu](http://szelearning.sze.hu) interface in MS Word.doc or .docx format, at the latest by the date indicated above. If an Excel spreadsheet is used to create a task, it must be also uploaded in .xls or .xlsx format.

The files to be uploaded should be named:

'assignment code' \_ 'student's name' \_ 'student's NEPTUN code'

The following data must appear on the opening page of the word file being uploaded:

- > the name and code of the assignment
- > the name of the student and the NEPTUN code

Each assinment scores 6-6 points, so a total of 18 points can be earned.

Assignments can be submitted only in the way indicated above until the given deadline. Failure to comply with the final submission deadlines means that the specific assignment cannot be evaluated and it cannot be scored. The given task cannot be submitted later on.

### **3. Laboratory measurement**

In this pandemic situation the laboratory measurement is cancelled.

### **4. Criteria and Rules for Evaluation of the assignments and the test report**

Assignments and reports are evaluated based on the principle of accuracy, accuracy and completeness / appearance. Assignments and reports are not returned to the students. The score obtained cannot be improved.

The measurement report cannot be evaluated and its score is zero if the test report is not about the measurement prescribed for the student,  
or during the measurement the student changed even only one initial data;

The score for the assignments / measure report to be evaluated is subject to deduction in the following cases:

- > files not entered in the specified format - 1 point / file
- > files are not named as specified - 1 point / file
- > excel file used but not entered - 3 points
- > the opening page of the submitted report does not contain the required data - 1 point.

If two or more students submit an assignment / measurement report that matches in structure, words, and elaboration to an extent that it can be suspected that one is a copy or partial copy of the other, then all the work involved will be given zero points.

Scores collected for assignments and test report in previous semesters, can be requested to be accepted writing to [hadas.adam@ga.sze.hu](mailto:hadas.adam@ga.sze.hu) if the score is at least 50% of the maximum score. It is not possible to request the acceptance of scores of tests written in previous semesters. Request for taking into account previous scores should be sent not before 19/09/2021 (Sunday) midnight!

The request must indicate the semester when the assignment / test report was submitted!

### **5. Signature at the end of the semester and conditions of exam**

The course is subject to continuous evaluation, so the signature is of a purely technical nature, it is not related to it.

The end-of-semester grade is determined on the basis of the points collected by the student during the semester, as described in point 6.

### **6. Method of determining the semester grade**

You can take test in the end of the semester, in the following date.

- 1<sup>st</sup> test: 4<sup>th</sup> week
- 2<sup>nd</sup> test: 8<sup>th</sup> week
- 3<sup>rd</sup> test: 13<sup>th</sup> week
- retaken/replacement test: 14<sup>th</sup> week

The students will solve 4 practical exercises and answers 5 theoretical questions in each test.

The students use formula collection, which includes maximum 30 formulas, and it's written by hand and numbered the formulas.

If the total score is higher than 75 points and each test points are higher than 25 points, the points by the assignments will be added.

<b>total score for semester</b>	<b>grade</b>
0 - 74	fail (1)
75 - 89	pass (2)
90 - 119	satisfactory (3)
120 - 134	good (4)
135 -	excellent(5)

## **7. Improvement of insufficient semester grade**

Fail (1) semester grade can be improved by re-writing the test in the exam period, after applying for the dates written as the exam dates in the NEPTUN system. You can try to improve the grade twice.

## **8. Office hours**

The time and place of the weekly consultation, which will be held on a weekly basis, will be determined by the schedule and will be announced in a separate message.

On individual request via e-mail, individual consultation is possible at other times occasionally!

## **KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL**

Required literature (available in library and technical antique stores)

(only in hungarian)

Pattantyús Á. Géza: A gépek üzemtana Műszaki Könyvkiadó, Bp.

Recommended literature (available in library and technical antique stores)

(only in hungarian)

Füzy Olivér: Áramlástechnikai gépek Műszaki Könyvkiadó, Bp.  
Grúber József: Ventilátorok Műszaki Könyvkiadó, Bp.  
Fülöp Zoltán: Gázturbinák Műszaki Könyvkiadó, Bp.  
Komondy Zoltán: Hűtőgépek Tankönyvkiadó, Bp.  
Fülöp Zoltán: Gőzturbinák Tankönyvkiadó, Bp.  
Menyhárt József: Szellőzés technika Tankönyvkiadó, Bp.

Misc.

In the Documents section of the [szelearning.sze.hu](http://szelearning.sze.hu) site materials will be published that can be used for learning, preparing for tests, doing assignments, and preparing the measurement report.