Mathematics I

This course is intended for foreign students studying at our faculty and domestic students who registered it.

Due to coronavirus quarantine measures, the courses of Mathematics I will be held temporarily at distance, using electronic communication only.

Virus teaching regime:

- The primary communication channel is the email. We will contact you via your official email you have in KOS system. You may also use our email to contact us with anything related to our courses (asking questions, requesting extra study material, sending your completed homeworks).
- All the essential information and course materials will be published at this webpage. You will be notified of changes.
- A new, emergency communication channel for each course (subject) is set up at the university using Microsoft Teams platform. It can be used for *online chat-like communication with teachers during the usual course hours* according to standard schedule of the subject.

General study advices and rules for the emergency online study regime can be found in

Study advices

Essential weekly information for regular study

- *Week:* September 28 - October 4, 2020 - *Topic:* Vectors and matrices
  Vectors and matrices
- *Week:* October 5 - October 11, 2020 - *Topic:* Matrices and systems of equations
  Matrices and systems
- *Week:* October 12 - October 18, 2020 - *Topic:* Determinants, eigenvalues and inverse matrices
  Determinants and eigenvalues
- *Week:* October 19 - October 25, 2020 - *Topic:* Sequences and functions
  Sequences and functions
- *Week:* October 26 - November 1, 2020 - *Topic:* Functions and limits
  Functions and limits

Assessment requirements:

The delivery of all sample exams (completely and correctly solved) is necessary condition for obtaining the assessment from tutorials. Sample exam tests:

Exam 1

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Exam 2

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Exam 3

DEADLINE: October 30, 2020 - For the first part of the homework (1st exercise from Exam 1, 1st and 2nd exercise from Exam 2 and Exam 3).

Any homeworks that will either be incorrect, evidently just copied from someone else, or submitted after the deadline might be rejected. Please be careful, pay attention to your homework and deliver it in time, correctly solved and written.

If you have some part of the assessment homework done, please scan it to PDF and send it to us by email.

Content of the course:

Introduction to linear algebra - vectors, vector spaces, matrices, determinants, systems of linear equations. Analytic geometry in E_3 - straight lines and planes. Calculus of functions of single variable - limit, continuity, derivative, extrema, behaviour of a function, indefinite integral, methods of integration, definite integral.

- Plan of lectures (level Alpha) in academic year 2020/21
- Plan of lectures (level Beta) in academic year 2020/21

Lecturers

doc. Mgr. Ing. Tomáš Bodnár, Ph.D., Office: KN:D-303

- lectures: Monday, 12:30 - 14:00 and Friday 10:45 - 12:15.

Mgr. Hynek Řezníček, Office: KN:D-205b

- tutorials: Tuesday, 16:00 - 17:30 and Friday 12:30 - 14:00.

In the case of any problem (especially with assessments from tutorials, or with exams) contact your teacher.

Tutorials, assessments

Tutorials are obligatory. Assessment from tutorials (written in the study record) confirms *student's presence and activity* at the tutorials and elaboration of homework and tests. Assessment is a necessary condition for the exam. (I.e. student can make the exam only with the assessment written in the study record.) The assessments are written in the last semestral week, not later than one week after. Exceptions are possible only with the explicit agreement of the chair of the institute.

- Preliminary plan of tutorials in academic year 2020/21

Exams

Students can choose between the levels A (Alpha-standard) or B (Beta-lower), not later than 2 days

before the exam. The exam has a written form. Students are supposed to know and understand notions named in the plan of lectures, to know and understand named theorems (including their assumptions) and to be able to apply the theorems to simple problems. Students are recommended to solve individually problems from exam tests from previous years. The level of these problems corresponds to the exam of level A. Material required for the exam of level A coincides with the contents of lectures and with the contents of tutorials. The difference between the exams of levels A and B is especially in the choice and complexity of problems solved in the exam test.

There are several necessary conditions to be fulfilled by students in order to be admitted to the exam:

- Student must have a *valid assessment* from tutorials registered in the electronic system KOS. (students without valid assessment can't subscribe for the exam)
- Student has to *subscribe (register) in the KOS* system for the chosen date and level of the exam. (students who will be not subscribed for the exam in the KOS system can't participate in the exam)
- Student should come to the exam *in time*, i.e. he/she should be present in the examination room at least 10 minutes before the official start of the exam. (students who will come late, will be not allowed to participate in the exam)
- Student has to bring his/her *Student Identification Card*. (students will be not allowed to participate in the exam without presenting this card)

These conditions will be followed strictly, without any exceptions.

The detailed information is available in the

Notice of exams

from Mathematics I for the academic year 2019/20.

The detailed information will be made available at the end of semester in the *Notice of exams* from Mathematics II for the academic year 2020/21.

Sample exam tests:

Exam 1

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Exam 2

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Exam 3

Advantage of exam level A: The exam of level A provides three more credits than the exam of level B. Students, who finish the named courses (exact information on the list of these courses is provided by the study department) with the exam of level A, can complete the bachelor programme already after three years (in an individual study programme) and they are accepted to the master programme without entrance exams.

Literature:

- Neustupa, J.: Mathematics I, CTU Publishing House, Prague, 1996, (Part I, Part II)
- Neustupa, J. and Kračmar, S.: Problems in Mathematics I, CTU Publishing House, Prague, 1999
- Selected problems from the textbook Problems in Mathematics I
- Selected problems from the exam tests in previous years

- Keisler, H. J.: Elementary Calculus: An Infinitesimal Approach, 2nd edition, Prindle, Weber & Schmidt, 1986.
- Calculus Volume I., Volume II., Volume III., provided by https://cnx.org/.
- College algebra, provided by https://cnx.org/

Timetable:

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