Mathematics II

Due to coronavirus quarantine measures, the courses of Mathematics II 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.

The Microsoft Team was created, for online consultations. Textbook material for implicit functions, Riemann, double, triple, line and surface integral, together with potential fields chapter was added to the webpage.

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

Study advices

Essential weekly information for regular study

- *Week:* March 9 - March 15, 2020 - *Topic:* Implicit functions
  Implicit functions
- *Week:* March 16 - March 22, 2020 - *Topic:* Double integral
  Double integral
- *Week:* March 23 - March 29, 2020 - *Topic:* Triple integral
  Triple integral
- *Week:* March 30 - April 5, 2020 - *Topic:* Applications
  Applications
- *Week:* April 6 - April 12, 2020 - *Topic:* Line integral
  Line integral
- *Week:* April 13 - April 19, 2020 - *Topic:* Applications and potential
  Applications and potential
- *Week:* April 20 - April 26, 2020 - *Topic:* Surface integral
  Surface integral
- *Week:* April 27 - May 3, 2020 - *Topic:* Applications and integral theorems
  Applications and theorems
- *Week:* May 4 - May 10, 2020 - *Topic:* Review - Part I.
  Review - Part I.
- *Week:* May 11 - May 17, 2020 - *Topic:* Review - Part II.
  Review - Part II.

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

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. **The final deadline for homework delivery is May 17, 2020**

If you have some part of the assessment homework done, please scan it to PDF and send it to us by email. Don't wait and leave it at the end of semester!

Timetable (since March 23, 2020):

Yellow: Lectures, Green: Tutorials

For additional explanation, clarification and extra material contact the Lecture/Tutorial teacher by email or the Microsoft Teams platform for online consultation. You can post your questions and request anytime. The teachers will respond as quickly as possible. For *online live chat use the standard course hours* according to usual schedule. Ask for other extra consultations if needed. We will do our best to help you.

This course is intended for foreign students studying at our faculty and domestic students who registered for this subject in their study plan. Conditions and requirements for this course are almost identical to the equivalent course being held in Czech language.

Content:

Functions of several variables - domain, limit, continuity, partial derivatives, extrema, implicit function. Multiple integrals - double and triple integral, Fubini's theorem, applications Line integral, surface integral, Gauss theorem, potential.

- Requirements - Level A(Alpha)

in academic year 2019/2020

- Requirements - Level B(Beta)

in academic year 2019/2020

Lecturers

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

- lectures: Tuesday, 14:15 - 15:45 and Thursday 9:00 - 10:30.

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

- lectures: Wednesday 17:45-19:15 and Friday 9:00 - 10:30.

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 from tutorials obtained in previous years are not accepted*. Student has to obtain the assessment again. 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.

Exams

The exams from Mathematics II (level A and B) will be organized in the same way as in Mathematics I. 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 will be made available at the end of semester in the *Notice of exams* from Mathematics II for the academic year 2019/20.

Sample exam tests:

Exam 1

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Exam 2

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Exam 3

Literature:

- Neustupa, J., Kračmar S.: Mathematics II, CTU Publishing House, Prague, 1996,
  - Implicit functions pages_24-33
  - Riemann integral pages_34-47
  - Double integral pages_48-56
  - Triple integral pages_56-69
  - Line integral pages_70-83
  - Surface integral pages_84-103
  - Potential and solenoidal fields pages_104-118
- Finney, R. L., Thomas, G.B.: Calculus, Addison-Wesley, New York, Ontario, Sydney, 1994

Examples:

The *Collection of examples from Mathematics II* written in Czech by authors E. Brožíková, M. Kittlerová and F. Mráz (2016) contains both examples and their solutions. Here you find several parts translated in English. The examples in English have the same numbering but they are without solutions (corresponding solution you can find in the Czech version, which is in the brackets). English translations will be added gradually. By the star (*) are denoted the examples, which go beyond the requirements of the exam this year.

- Riemann integral [Určitý integrál]
- Calculus - part 1 (partial derivatives, ...) [Diferenciální počet-část 1]
- Calculus - part 2 (gradient, diferential, directional derivative, etc.) [Diferenciální počet-část 2]
- Implicit Functions [Implicitní funkce]
- Extrema [Extrémy]
- Double integral [Dvojný integrál]
- Triple integral [Trojný integrál]
- Line integral [Křivkový integrál]
- Surface integral [Skalární] [Vektorový]
- Divergence theorem [Gaussova-Ostrogradského věta]

Web additional sources:

- **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/.**
- Paul's Online Math Notes have gotten the notes/tutorials for Algebra, Calculus I, Calculus II, Calculus III and Differential Equations class online.
- Just Math Tutoring is a web site of Patrick from Vanderbilt University, who provide clear and thorough explanations, and to present them in an environment in which the student is comfortable.
- The Math Insight web site is a collection of pages and applets designed to shed light on concepts underlying a few topics in mathematics (see Index)
- Mathispoewr4u tutorials. This site provides over 3,500 free mini-lessons and example videos with no ads. The videos are organized by course and topic.

Timetable:



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