

# 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.

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

Study advices

## Exams

**Regular exam is scheduled for June 4, 2021. Students who will fail can retake the exam later on June 11 and 18, 2021. Exams are online, based on the rules set in [Rector's Order No. 09/2020](#) and [detailed instructions](#). In case you need some further information or explanation contact us immediately by email.**

## Essential weekly information for regular study

- Week: February 22 - February 28, 2021 - *Topic:* Functions of multiple variables  
Functions of multiple variables
- Week: March 1 - March 7, 2021 - *Topic:* Partial derivatives, differentials  
Partial derivatives, differentials
- Week: March 8 - March 14, 2021 - *Topic:* Implicit functions  
Implicit functions
- Week: March 15 - March 21, 2021 - *Topic:* Extrema  
Extrema
- Week: March 22 - March 28, 2021 - *Topic:* Double integral  
Double integral
- Week: April 12 - April 18, 2021 - *Topic:* Triple integral  
Triple integral
- Week: April 19 - April 25, 2021 - *Topic:* Line integral  
Line integral
- Week: April 26 - May 2, 2021 - *Topic:* Potential fields  
Potential fields

- Week: May 3 - May 9, 2021 - Topic: Surface integral  
Surface integral
- Week: May 10 - May 16, 2021 - Topic: Integral theorems  
Integral theorems

### 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

Exam 2

Exam 3

**DEADLINE: May 21, 2021 for the third part of the homework (5th and 6th exercise from Exam 1, Exam 2 and Exam 3, and exercise 3 from Exam 1A and exercise 3 from Exam 3A)**

*Students who have passed in the first part of the homework should submit the second part by email to [Mgr. Hynek Řezníček](#). All the other students (who failed in the first part) should submit the second part by email directly to [doc. Mgr. Ing. Tomáš Bodnár, Ph.D.](#).*

The homeworks solutions will be delivered in three parts (by chapters). The deadlines will be set during the semester by the tutorials teacher. Students who will fail in any of the three parts of the homework will not obtain the assessment from tutorials (and can't participate in the exam).

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.

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 2020/2021
- Requirements - Level B(Beta)  
in academic year 2020/2021

## Lecturers

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

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

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

- lectures: Wednesday 16:00-17:30 and Friday 16:00 - 17:30.

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

Exam 2

Exam 3

## Literature:

- Neustupa, J., Kračmar S.: Mathematics II, CTU Publishing House, Prague, 1996,
- Finney, R. L., Thomas, G.B.: Calculus, Addison-Wesley, New York, Ontario, Sydney, 1994
  - Functions of multiple variables pages\_01-23
    - 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

## 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, differential, 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:

Timetable for <b>Mathematics II.</b> Semestr Summer 2020-1, Code E011068, Range 4P+4C												Lectures	Tutorial	Laborat.	Other
	1. 7:15	2. 8:00	3. 9:00	4. 9:45	5. 10:45	6. 11:30	7. 12:30	8. 13:15	9. 14:15	10. 15:00	11. 16:00	12. 16:45	13. 17:45	14. 18:30	15. 19:30
<b>MON</b>					KN:A-311 Bodnár T. P1, avail./cap.: [6/40]										
<b>TUE</b>															
<b>WED</b>											KN:A-311 Řezníček H. C101, avail./cap.: [6/40]				
<b>THU</b>															
<b>FRI</b>						KN:A-311 Bodnár T. P1, avail./cap.: [6/40]					KN:A-311 Řezníček H. C101, avail./cap.: [6/40]				

(<https://kos.fs.cvut.cz/timetable/course/E011068/en>) Buildings-rooms: **T4:XX-XXX** - Technická street 4, Praha 6 **KN:X-XXX** - Karlovo náměstí 3, Praha 2 **HO:X-XXX** - Horská street 3, Praha 2

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