

Course description

Course abbreviation: KFY/UVMAX
Course name: Introduction to Higher Mathematics
Academic Year: 2016/2017

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Department/Unit /	KFY / UVMAX	Academic Year	2016/2017
Title	Introduction to Higher Mathematics	Type of completion	Pre-Exam Credit
Accredited/Credits	Yes, 3 Cred.	Type of completion	
Number of hours	Přednáška 1 [Hours/Week] Seminář 2 [Hours/Week]	Course credit prior to	NO
Occ/max	Status A Status B Status C	Counted into average	NO
Summer semester	0 / - 0 / - 0 / -	Min. (B+C) students	not determined
Winter semester	26 / - 8 / - 0 / -	Repeated registration	NO
Timetable	Yes	Semester taught	Winter semester
Language of instruction	Czech	Internship duration	0
Substituted course	None		
Preclusive courses	KFY/UVMA1 and KMA/INDIP and KMA/MA2OB		
Prerequisite	N/A		
Informally recommended courses	N/A		
Courses depending on this Course	N/A		

Course objectives:

Diferenciální a integrální počet funkcí jedné reálné proměnné.

Requirements on student

The student should:

- be able to derive and integrate functions of one real variable
- be able to use derivations and integrals in selected applications.

Approximately in the half of semester student will take a test on differential calculus of one variable functions (max. 50 points). During the exam period student will take a test on integral calculus of one variable functions (max. 50 points).

Classification is in accordance with the Study and examination regulations of OU (1.9. 2015).

Content

Differential calculus of function of one real variable

- 1) Continuity and limit.
- 2) Derivation.
- 3) Vectorial and complex functions.
- 4) Local and global extremes of one real variable functions.
- 5) Solution of course of one real variable functions.
- 6) First differential, Taylor expansion.
- 7) L'Hospital's rule

Integral calculus of function of one real variable

- 8) Primitive function, indefinite integral.
- 9) Integration by parts.
- 10) Integration by substitution.
- 11) Integration of rational function.
- 12) Selected special integrals.
- 13) Newton and Riemann definite integrals, infinite integrals.

Prerequisites - other information about course preconditions

none

Competences acquired

The student:

- is able to derive and integrate functions of one real variable and
- uses derivatives and integrals in selected applications

Fields of study**Guarantors and lecturers**

- **Guarantors:** doc. RNDr. Libor Koniček, PhD.
- **Lecturer:** Mgr. Aleš Vítek, Ph.D.
- **Seminar lecturer:** Mgr. Aleš Vítek, Ph.D.

Literature

- **Basic:** KALUS, R., HRIVŇÁK, D. *Breviář vyšší matematiky. 1. vyd. Ostrava: Ostravská univerzita, 2001. 132 s. ISBN 80-7042-819-8.* &, &.
- **Extending:** K. Rektorys. *Přehled užití matematiky (SNTL, Praha 1981) nebo novější vydání.*
- **Recommended:** K. Rektorys. *Co je a k čemu je vyšší matematika, 1. vydání (Academia, Praha 2001).*
- **Recommended:** J. Coufal, J. Klůfa. *Matematika pro ekonomické fakulty I, 1. vydání (Ekopress, Praha 2000).*
- **Recommended:** M. Kaňka, J. Henzler. *Matematika pro ekonomické fakulty II, 1. vydání (Ekopress, Praha 2000).*

Time requirements

Activities	Time requirements for activity [h]
Being present in classes	39
Self-tutoring	10
Preparation for test	15
Continuous tasks completion (incl. correspondence tasks)	10
Consultation of work with the teacher/tutor (incl. electronic)	5
Total:	79

assessment methods**professional knowledge**

- Point system
- Written examination

teaching methods**professional knowledge**

- Briefing
- Dialogic (discussion, dialogue, brainstorming)
- Monologic (explanation, lecture, briefing)

learning outcomes**professional knowledge - knowledge resulting from the course:**

The student:

- is able to derive and integrate functions of one real variable and
- uses derivatives and integrals in selected applications

Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan	v.	Year	Block	Status	R.year	R.
Biology	Bachelor	Full-time	Experimental Biology	1	2016		2016	Povinné předměty	A	2	ZS
Biology	Bachelor	Full-time	Experimental Biology	1	2		2016	Povinné předměty	A	2	ZS
Biology	Bachelor	Full-time	Společný základ dvouoborového Bc. studia	1	2		2016	Průpravné předměty	B		ZS
Chemistry	Bachelor	Full-time	Chemistry	1	2012		2016	Povinně volitelné předměty	B	1	ZS
Physics	Bachelor	Full-time	Společný základ dvouoborového Bc. studia	1	2		2016	Průpravné předměty	B		ZS