

Course description

Course abbreviation:	KMA/DIM1	Page:	1 / 4
Course name:	Didactics of Mathematics 1		
Academic Year:	2023/2024	Printed:	01.06.2024 08:31

Department/Unit /	KMA / DIM1			Academic Year	2023/2024
Title	Didactics of Mathematics 1			Type of completion	Pre-Exam Credit
Accredited/Credits	Yes, 3 Cred.			Type of completion	Oral
Number of hours	Lecture 1 [Hours/Week] Tutorial 2 [Hours/Week]				
Occ/max	Status A	Status B	Status C	Course credit prior to	NO
Summer semester	0 / -	0 / -	0 / -	Counted into average	NO
Winter semester	3 / -	0 / -	0 / -	Min. (B+C) students	1
Timetable	Yes			Repeated registration	NO
Language of instruction	Czech			Semester taught	Winter semester
Optional course	Yes			Internship duration	0
Evaluation scale	S N				
No. of hours of on-premise					
Auto acc. of credit	No				
Periodicity	K				
Substituted course	None				
Preclusive courses	N/A				
Prerequisite courses	N/A				
Informally recommended courses	N/A				
Courses depending on this Course	N/A				

Course objectives:

Introduction to theoretical basics of mathematical didactics and their practical application in secondary school mathematics.

Requirements on student

Active participation in tutorials (especially during simulations of the secondary school maths lessons).

Pre-exam credit: Semestral project on a given topic (in the second week of the semester) and one knowledge test in the scope of delivered lectures during semester.

Content

1. subject and methods of mathematical didactics, mathematics as a science and as a subject for teaching;
2. the evolution of maths teaching at our secondary schools and schools abroad, modern trends in maths teaching;
3. fundamentals of didactics in maths teaching, ways of teaching mathematics;
4. methods in maths teaching, troubles in teaching;
5. communication in maths teaching, the language of mathematics in the school work experience;
6. the logical structure of mathematics as a subject;
7. math problems in the middle school mathematics;
8. applications in maths teaching;
9. didactic games in maths teaching, elements of ecological education in maths teaching;
10. the use of didactic devices and computers in maths teaching;
11. the framework educational programmes for mathematics at primary and secondary schools;
12. the school educational programme for mathematics at primary and secondary schools;
13. pre-exam credit.

Fields of study

Guarantors and lecturers

- **Guarantors:** Prof. RNDr. Miroslav Lávička, Ph.D. (100%)
- **Lecturer:** PaedDr. Josef Kubeš (100%)
- **Tutorial lecturer:** PaedDr. Josef Kubeš (100%)

Literature

- **Basic:** Polák, Josef. *Didaktika matematiky I. část*. 2014. ISBN 978-80-7238-449-5.
- **Basic:** Polák, Josef. *Didaktika matematiky II. část*. ISBN 978-80-7489-326-1.
- **Basic:** Polák, J. *Přehled středoškolské matematiky*. Praha : Prometheus, 2008. ISBN 978-80-7196-356-1.
- **Extending:** Květoň, Pavel. *Cvičení z didaktiky matematiky*. Vyd. 1. Ostrava : Ostravská univerzita, 2000. ISBN 80-7042-171-1.
- **Extending:** Růžicková, Bronislava. *Didaktika matematiky*. Olomouc : Univerzita Palackého, 2002. ISBN 80-244-0534-2.
- **Extending:** Hejný, Milan. *Teória vyučovania matematiky 2*. 1990. ISBN 8008013443.
- **Recommended:** Polák, Josef. *Středoškolská matematika v úlohách I*. Praha : Prometheus, 2006. ISBN 80-7169-337-2.
- **Recommended:** Polák, J. *Středoškolská matematika v úlohách II*. Praha : Prometheus, 1999. ISBN 80-7196-166-3.

Time requirements

All forms of study

Activities	Time requirements for activity [h]
Contact hours	39
Preparation for comprehensive test (10-40)	20
Presentation preparation (report) (1-10)	10
Preparation for formative assessments (2-20)	9
Total:	78

assessment methods

Knowledge - knowledge achieved by taking this course are verified by the following means:

- Test
- Seminar work
- Skills demonstration during practicum

Skills - skills achieved by taking this course are verified by the following means:

- Test
- Seminar work
- Skills demonstration during practicum

Competences - competence achieved by taking this course are verified by the following means:

- Test
- Seminar work
- Skills demonstration during practicum

prerequisite

Knowledge - students are expected to possess the following knowledge before the course commences to finish it successfully:

rozumět středně pokročilým teoriím z různých oblastí matematiky (matematická analýza, algebra, aritmetika, geometrie, statistika atd.)

orientovat se v základních metodách obecné pedagogiky, psychologie a pedagogické psychologie

vysvětlit alespoň rámcově členění českého školského systému

Skills - students are expected to possess the following skills before the course commences to finish it successfully:

popsat a vysvětlit poznatky z různých matematických disciplín (matematická analýza, algebra, aritmetika, geometrie, statistika atd.)

používat základní postupy z obecné pedagogiky, psychologie a pedagogické psychologie

přiblížit odborné téma i laické veřejnosti

Competences - students are expected to possess the following competences before the course commences to finish it successfully:

N/A

N/A

N/A

teaching methods

Knowledge - the following training methods are used to achieve the required knowledge:

Practicum

Individual study

Task-based study method

Discussion

Skills - the following training methods are used to achieve the required skills:

Practicum

Individual study

Task-based study method

Discussion

Competences - the following training methods are used to achieve the required competences:

Practicum

Individual study

Task-based study method

Discussion

learning outcomes

Knowledge - knowledge resulting from the course:

rozumět předmětu a metodám didaktiky matematiky

orientovat se ve vývoji vyučování matematice na našich školách a v zahraničí, chápat modernizační snahy ve vyučování matematice

vysvětlit didaktické zásady ve vyučování matematice a chápat formy vyučování matematice

popsat metody vyučování matematice, vysvětlit význam problémového vyučování

vysvětlit význam matematických úloh, aplikací a didaktických her ve vyučování matematice

vysvětlit problematiku rámcových a školních vzdělávacích programů v matematice na ZŠ a SŠ

Skills - skills resulting from the course:

používat didaktické zásady ve vyučování matematice

správně aplikovat komunikaci ve vyučování matematice a jazyk matematiky ve školské praxi

provádět logické strukturování matematické látky

zařazovat vhodně zvolené matematické úlohy v konkrétních fázích vyučovacího procesu

vykládat matematiku na střední škole s odborným nadhledem a zajímavě, včetně aplikací

využívat didaktickou techniku a výpočetní techniku ve vyučování matematice

Competences - competences resulting from the course:

N/A

N/A

N/A

Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Mathematics	Postgraduate Master	Full-time	Training Teachers of Mathematics at Higher Secondary Schools	1	2018	2023	Matematika - didaktické předměty	A	1	ZS
Učitelství matematiky pro střední školy	Postgraduate Master	Full-time	Secondary School Education Mathematics - Major	1	2020	2023	Matematika - didaktické předměty	A	1	ZS
Učitelství matematiky pro střední školy	Postgraduate Master	Full-time	Secondary School Education Mathematics - Minor	1	2020	2023	Matematika - didaktické předměty	A	1	ZS
Upper Secondary School Teacher Training in Biology	Postgraduate Master	Full-time	Upper Secondary School Teacher Training in Biology	1	2023	2023	Matematika - didaktické předměty	A	1	ZS
Upper Secondary School Teacher Training in Biology	Postgraduate Master	Full-time	Upper Secondary School Teacher Training in Biology	1	2020	2023	Matematika - didaktické předměty	A	1	ZS
Upper Secondary School Teacher Training in Biology	Postgraduate Master	Full-time	Upper Secondary School Teacher Training in Biology	1	2021	2023	Matematika - didaktické předměty	A	1	ZS
Upper Secondary School Teacher Training in Biology	Postgraduate Master	Full-time	Upper Secondary School Teacher Training in Biology	1	2022	2023	Matematika - didaktické předměty	A	1	ZS
Upper Secondary School Teacher Training in Geography	Postgraduate Master	Full-time	Upper Secondary School Teacher Training in Geography	1	2023	2023	Matematika - didaktické předměty	A	1	ZS
Upper Secondary School Teacher Training in Geography	Postgraduate Master	Full-time	Upper Secondary School Teacher Training in Geography	1	2022	2023	Matematika - didaktické předměty	A	1	ZS
Upper Secondary School Teacher Training in Geography	Postgraduate Master	Full-time	Upper Secondary School Teacher Training in Geography	1	2021	2023	Matematika - didaktické předměty	A	1	ZS
Upper Secondary School Teacher Training in Geography	Postgraduate Master	Full-time	Upper Secondary School Teacher Training in Geography	1	2020	2023	Matematika - didaktické předměty	A	1	ZS
Upper Secondary School Teacher Training in Chemistry	Postgraduate Master	Full-time	Upper Secondary School Teacher Training in Chemistry	1	2022	2023	Matematika - didaktické předměty	A	1	ZS
Upper Secondary School Teacher Training in Chemistry	Postgraduate Master	Full-time	Upper Secondary School Teacher Training in Chemistry	1	2020	2023	Matematika - didaktické předměty	A	1	ZS
Upper Secondary School Teacher Training in Chemistry	Postgraduate Master	Full-time	Upper Secondary School Teacher Training in Chemistry	1	2021	2023	Matematika - didaktické předměty	A	1	ZS
Upper Secondary School Teacher Training in Chemistry	Postgraduate Master	Full-time	Upper Secondary School Teacher Training in Chemistry	1	2023	2023	Matematika - didaktické předměty	A	1	ZS