Course description

| Course abbreviation: | KMA/MAM2 | Acthomatics 2 | | | | Page: | 1 / 2 |
|----------------------------------|---------------|-----------------|---------------------|---|------------------------|------------|---------|
| Academic Year: | 2023/2024 | Aamematics 2 | | | Printed: | 14.07.2025 | 20:43 |
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| Department/Unit / | KMA / MAM | 2 | | | Academic Year | 2023/2024 | |
| Title | Management I | Mathematics 2 | | | Type of completion | Exam | |
| Accredited/Credits | Yes, 4 Cred. | | | | Type of completion | Combined | |
| Number of hours | Lecture 2 [Ho | urs/Week] Tutoi | rial 1 [Hours/Week] |] | | | |
| Occ/max | Status A | Status B | Status C | | Course credit prior to | Yes | |
| Summer semester | 0 / - | 0 / - | 0 / - | | Counted into average | YES | |
| Winter semester | 0 / - | 0 / - | 0 / - | | Min. (B+C) students | 1 | |
| Timetable | Yes | | | | Repeated registration | NO | |
| Language of instruction | Czech | | | | Semester taught | Summer se | emester |
| Optional course | Yes | | | | Internship duration | 0 | |
| Evaluation scale | 1 2 3 4 | | | | Ev. sc. – cred. | S N | |
| No. of hours of on-premise | | | | | | | |
| Auto acc. of credit | No | | | | | | |
| Periodicity | every year | | | | | | |
| Specification periodicity | | | | | | | |
| Substituted course | None | | | | | | |
| Preclusive courses | KMA/MAM2 | A | | | | | |
| Prerequisite courses | N/A | | | | | | |
| Informally recommended courses | | KMA/MAM1 o | or KMA/MAM1A | | | | |
| Courses depending on this Course | | N/A | | | | | |

Course objectives:

The aim of this course is to further develop knowledge of management mathematics.

Requirements on student

written test, oral exam

Content

Mathematical modelling in economy, finance and management. Advanced problems described by non-linear difference and differential equations with constraints. Emphasis on optimal solution.

Non-linear differential equations with delays and their applications.

Continuous-time stochastic finance models.

Advanced applications to financial modelling and risk analysis, building of real application models and their analysis, production processes description, logistics and supply chain management, decision making tools.

Fields of study

Guarantors and lecturers

• Guarantors: doc. Ing. Radek Cibulka, Ph.D. (100%)

Literature

| • Recommended: | Klamka, Jerzy. Controlability of Dynamical Systems. Kluwer Academic Publishers, 1991. ISBN 0792308220. |
|----------------|---|
| • Recommended: | Sethi P. Suresh, Thompson Gerald L. <i>Optimal control theory: applications to management science and economics</i> . Springer, 2005. |
| • Recommended: | Shreve, Steven E. <i>Stochastic calculus for finance. II, Continuous-time models</i> . New York : Springer, 2004. ISBN 0-387-40101-6. |

Time requirements

| All forms of study | | | | | | |
|--|--------|------------------------------------|--|--|--|--|
| Activities | | Time requirements for activity [h] | | | | |
| Preparation for an examination (30-60) | | 40 | | | | |
| Individual project (40) | | 40 | | | | |
| Contact hours | | 39 | | | | |
| | Total: | 119 | | | | |

assessment methods

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

Oral exam

Written exam

prerequisite

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

Units which must be passed before this unit may be attempted: KMA/MAM1 or KMA/MAM1A.

teaching methods

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

Lecture supplemented with a discussion

Interactive lecture

learning outcomes

Knowledge - knowledge resulting from the course:

Students taking this course will be able to grasp the problems of management mathematics and namely

- recognize which mathematical optimization tools are appropriate and suitable for modelling given research problem
- apply these tools to practical management problems
- solve non-linear problems via abstract methods

- apply correctly formal and rigorous competency in mathematical presentation, both in written and verbal form.

Course is included in study programmes: