Course description

Department/Unit /	KI / NME			**Academic Year**	2012/2013
Title	Numerical Methods			**Type of completion**	Exam
Accredited/Credits	No, 5 Cred.			**Type of completion**	Combined
Number of hours	Přednáška 2 [HOD/TYD] Seminář 2 [HOD/TYD]				
Occ/max	Status A	Status B	Status C	**Course credit prior to**	YES
Summer semester	0 / -	0 / -	0 / -	**Counted into average**	YES
Winter semester	30 / -	0 / -	0 / 0	**Min. (B+C) students**	not determined
Timetable	Yes			**Repeated registration**	NO
Language of instruction	Czech, English			**Semester taught**	Winter semester
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	K				
Substituted course	None				
Preclusive courses	N/A				
Prerequisite courses	KMA/P110 or KMA/P136				
Meet all prerequisites before registering	YES				
Informally recommended courses	KMA/P231 and KMA/P232 and KI/PGL1				
Courses depending on this Course	N/A				

Course objectives:

Introduction to the numerical mathematics. The emphasis is put on the solution of problems of continuous mathmeatics on the computer.

Requirements on student

Content

Lagrange interpolation, interpolation with spline-functions, numerical quadrature, LU factorization and Gauss elimination, basic iterative methods for the solution of linear algebraic equations, gradient methods, computation of eigenvalues, solution of nonlinear equations, numerical solution of ordinary differential equations.

Prerequisites - other information about course preconditions

Teaching in English is meant only for erasmus and foreign students. In the case of a small number of students is teaching in a form of individual consultations.

Competences acquired

Fields of study

Guarantors and lecturers

- **Guarantors:** doc. RNDr. Jiří Felcman, CSc. (100%)
- **Lecturer:** doc. RNDr. Jiří Felcman, CSc. (100%)

- **Seminar lecturer:** doc. RNDr. Jiří Felcman, CSc. (100%), Mgr. Květuše Sýkorová (100%), RNDr. Jiří Škvor, Ph.D. (100%)

Literature

- **Basic:** Feistauer M., Felcman J., Straškraba I. *Mathematical and Computational Methods for Compressible Flow, Oxford University Press, Oxford*. 2003.
- **Basic:** Segethova, J. *Základy numerické matematiky. Karolinum, Praha.*.
- **Extending:** Ueberhuber, W. *Numerical Computation 1, 2: Methods, Software, and Analysis. Springer, Berlin.*.
- **Extending:** Quarteroni, A., Sacco, R., and Saleri, F. *Numerical Mathematics (2ndedn), Volume 37 of Texts in Applied Mathematics. Springer, Berlin. ISBN 0-387-98959-5.*.
- **Extending:** The accuracy of solutions to triangular systems. SIAM J.Appl. Math., 26(5), 1252?1265. (Higham, N.)

Teaching methods

Assessment methods

Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Applied Informatics	Bachelor	Full-time	Information Systems	1	A11	2012	Povinné předměty	A	2	ZS
Applied Informatics	Bachelor	Full-time	Information Systems	1	A12	2012	Povinné předměty	A	2	ZS
Applied Informatics	Bachelor	Full-time	Information Systems	1	A8	2012	Povinné předměty	A	2	ZS