E – Charakteristika studijního předmětu/Subject Specification

Název studijního předmětu / Subject title	Applied Mathematics				
Typ předmětu / Subject type	obligatory			**dopor. ročník / semester/ recommended year / semester**	1/1
Rozsah studijního předmětu / Study load in hours and credits		**hod. za týden / weekly load**	6+2	**Kreditů / Credits**	10
Jiný způsob vyjádření rozsahu / Other expression of study load	14 weeks, each 6 hours of lectures and 2 hours of seminary				
Způsob zakončení / Assessment	Examination			**Forma výuky / Form of teaching**	Lectures seminars
Další požadavky na studenta / Other demands on students					

Vyučující / Lecturer

Prof. Dr. Ing. Jiří Maryška, CSc., Doc. Petr Volf, CSc.

Stručná anotace předmětu / Subject annotation

The objective of the subject is to inform students on advanced mathematical methods of solution of ordinary and partial differential equations and statistical methods with use of computers. The core subject topics are analytical solution of ordinary differential equations, numerical methods Runge-Kutta, basics of functional analysis, metric spaces, Hilbert and Banach spaces, spaces of smooth and integrable functions, Sobolev spaces, classification of partial differential equations and Finite Difference Method. The basic models and characteristics of probability distributions are recalled briefly. Selected methods of statistical data analysis and modelling are explained, including the maximum likelihood and Bayes principles, analysis of dependence and trend (correlation, regression), classification, statistical recognition and data mining methods, basic models of random processes. The procedures are illustrated on the solution of simple studies with the aid of Matlab.

Informace ke kombinované nebo distanční formě / Information for students in external form of study		
Rozsah konzultací (soustředění) / Consultations, study meetings		**hodin za týden / hours per week**
Rozsah a obsahové zaměření individuálních prací studentů a způsob kontroly / Individual student work – type, load, content and way of checking		

Studijní literatura a studijní pomůcky / Reading list and study utilities

- Variational Methods in Mathematics, Science and Engineering / Karel Rektorys. -- 2. ed. -- Dordrecht : Reidel, 1980
- T.H.Wonnacotttt, R.J.Wonnacott, Introductory Statistics for Business and Economics, Wiley, N.Y., 1990.
- Web sources, texts prepared by the lecturers.