



## COURSE DATASHEET

<b>Semester:</b>	2014/15/1
<b>Course:</b>	Matamatical applications in engineering education
<b>Code:</b>	VEMKFKB142M
<b>Responsible department:</b>	Department of Physical Chemistry
<b>Department code:</b>	MKFK
<b>Responsible instructor:</b>	dr. Dezső Boda

---

### Course objectives:

The objective is to support the self confident usage of mathematical tools in subjects taught for engineer students. The disiplines are taught without detailed proofs concentrating on examples. The implementation of various numerical procedures in computers will be presented.

### Course content:

1. Properties of functions. Differentiation of one-variable functions. 2. Derivatives of elementary functions. Rules of differentiation. 3. Integration of one-variable functions. 4. Vectors, operations with vectors, vectors in Chartesian, polar, and cylindrical coordinate systems. 5. Multi-variable functions, scalar fields, vector fields, total differential, partial derivatives. 6. Vector analyzis. Gradients, curl, divergence, surface and volume integrals. Integral theorems. 7. Matrix calculus, fundamentals of linear algebra. 8. Basics of probability theory. 9. Ordinary differential equations. 10. Partial differential equations. 11. Numerical procedures and their implementation in computers. 1. Basics of mathematical programming. 12. Numerical procedures and their implementation in computers. 2. Interpolation, extrapolation, numerical integration, solving equations numerically. 13. Numerical procedures and their implementation in computers. 3. Error calculation, Fourier-transform. 14. Numerical procedures and their implementation in computers. 4. Numerical solution of differential and integral equations. 15. Test

### Requirements, evaluation and grading:

None

### Required and recommended readings:

Bronstejn-Szemengyajev: Matematikai zsebkönyv; Thomas, Weir, Hass, Giordano: Thomas-féle kalkulus I-III.; Obádovics: Matematika