



Syllabus

Term: 2020/21/1 **Subject name:** Engineering Mathematics 3. **Subject code:** MSB295ANEP

Unit (Unit code) (MIK-MS)

Lecturer responsible for the course: Dr. PERJÉGINÉ DR Hámori Ildikó Viktória

Requirement: Mid-semester grade

Classes per week : 1/2/0/0

Classes per term: 5/10/0/0

Purpose of education:

The presentations give some elements of important mathematical techniques which is used in civil engineering practice.

Upon completion of this course the student should be able to:

1. **interpret**, and **put into practice** first- and second order ordinary differential equations (ODEs),
2. **model** and **analyse** problems where random comes into consideration,
3. **apply** quantities of descriptive statistics to **describe** data sets,
4. **interpret** and **implement** basic **statistical computations** of inferential statistics.

Contents:

Brief Syllabus: This lecture and laboratory work based course aims to give engineering students a solid mathematics basis through covering the following topics:

- *Elements of ordinary differential equations:* classification, types of solutions, analytical solution of first order, separable and linear differential equations, solution of second order incomplete and linear with constant coefficients ODEs,
- *Elements of probability:*
 - Classical probability: random events, experiments, sample space, computing probability with combinatorial, geometrical methods, conditional probability and independence, Bayes' theorem and the law of total probability,
 - *Random variables:* discrete and continuous random variables, transformations of random variables, expectation and variance and their properties, Markov's, Chebishev's inequality, law of large numbers, central limit theorem, joint and marginal random variables, independence, covariance, correlation,
- *Elements of statistics:*
 - elements of descriptive statistics, commonly used quantities
 - inferential statistics: point estimation of mean and variance, interval estimation: confidence interval for the mean in case of normal populations, statistical tests of samples, hypothesis and its alternative(s), errors, linear regression and correlation, goodness of regression by chi-square test.



Syllabus

Term: 2020/21/1 **Subject name:** Engineering Mathematics 3. **Subject code:** MSB295ANEP

System of examing and valuation:

Attendance:

Attending is required all classes, and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lessons will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 15 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

Grading

The final result will be calculated as the arithmetic average of midterm tests modified by the above described percentage of attendance. Grading is as:

Grading Scale:

Numeric Grade:	5	4	3	2	1
Evaluation:	89%-100%	77%-88%	66%-76%	51%-65%	0-50%

Bibliography:

1. Sheldon M. Ross, Introduction to probability and statistics for engineers and scientists, 2nd Edition, Elsevier Academic Press, 2004.
2. Subject materials on Neptun Meet street, MS Teams

Randomservices.org
