

Course Syllabus

Academic year: 2018-2019

Institution	University of Petroșani
Faculty	Mechanical and Electrical Engineering
Field of study	Industrial engineering
Level	Bachelor
Program of study	Machine Building Technology

Course	Numerical methods
Code	2BB3OF18
Year of study (semester)	II (III)
Number of hours	56
Number of credits	4
Professor	Lecturer eng,Ph.D. VLADISLAV Daniel

No.	Topic
1.	Theories of errors. Approximate numbers. Errors. Operations with approximate numbers.
2.	Solving algebraic and transcendent equations. Limits of real roots. Rolle, Sturm, Budan-Fourier. The Descarts theorem. The iteration method for solving the equation $x = g(x)$. Chord method and tangent method to solve the equation $f(x) = 0$.
3.	Solving linear systems equations. Exact methods (the successive elimination method of the triangular matrices of Haletsky). Approximate methods (approximate Jacobi method, Gauss-Seidel method).
4.	Solving systems of nonlinear equations. The iterative string of Newton, the successive approximation method.
5.	The approximation of functions by polynomials. Lagrange's interpolation polynomial. Newton's interpolation polynomials.
6.	Numerical integration. Newton-Cotes quadrature formulas (trapeze formula, Simpson formula). Gauss's formula. Simpson's quadrature formula.



Ministry of Education
UNIVERSITY OF PETROSANI
20 Universitatii Street, Petrosani, County of Hunedoara, Romania
e-mail: erasmusplus@upet.ro | erasmus.upet@gmail.com
tel: +40 (254) 54 90 09 | www.upet.ro



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7.	Rezolvarea numerică a ecuațiilor diferențiale. Problema Cauchy. Metoda unipas (Taylor și Runge-Kutta). Metoda multipas (Adams-Bashforth-Moulton. Probleme la limită. Metoda matricelor bandă.
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