

841. APPLIED MATHEMATICS FOR ENERGETIC

CONTENTS

1 Semester (3h+2h)

Calculus of variations. Variational problems. Conditions for extreme. The simplest problem. Generalizations. Isoperimetric problems. Applications.

Distributions. The Lebesgue integral. Notion of distribution. Derivation. Fourier series and integrals.

Operator Theory. Hilbert spaces. Orthonormal bases. Operators. Adjoint operator. Compact operators.

Integral Equations. Introduction. Fredholm equation. Eigenfunctions. Variational principles.

Interpolation. Lagrange's formula. Newton's formula. Hermite interpolation. The error in polynomial interpolation.

Numerical integration. The formulas of Newton and Cotes. Integrating by extrapolation. Gaussian methods.

Numerical Solution of Ordinary Differential Equations. The Euler method. Runge and Kutta methods. Linear multistep methods.

Numerical Solution of Partial Differential Equations. Parabolic equations. Elliptic equations. Hyperbolic equations.

TEXT (BASIC BIBLIOGRAPHY)

"Applied Mathematics". J.D. Logan; John Wiley.

"Greens Functions". J. Stakgold; John Wiley.

"Numerical Analysis" R.L. Burden J.D. Faires A.C. Reynolds. Wadsworth Ints.

Teachers: R. Riaza

Exams:

F1: 02-02(T)

F2:

F3:

F4: 21-06(M)

F5: 21-09(T)