

SEMINAR : ADVANCED MATHEMATICAL METHODS IN ENGINEERING

10 weekly lectures in English. Each lecture corresponds to 2 academic hours

For Ph.D and MSc. candidate as well as the faculty and staff of the School of Engineering

Starting date: 19/1/020, Classroom:Γ7

Instructor: Dr. Dimitris Karayannakis

Professor Emeritus, School of Engineering

Hellenic Mediterranean University

LECTURES 1&2

Topics of Linear Algebra II (SVD of $m \times n$ matrices, sesquilinear forms, rotation in 3D)

LECTURE 3,4 &5

Extensions of Laplace Transform theory (Calculation of the Laplace transform of x^α when $\alpha > 0$ is not an integer using the gamma function,

LECTURE 6

Use of the Fourier Transform and Delta function for solving unusual ODE S (The serial RLC circuit with an abrupt huge HMP at an instant $t_0 \geq$ and the oscillation of the spring when a huge outer force is exerted instantly)

LECTURE 7&8

Classical and not classical Continuous Probability Distributions (Uniform, Exponential, Normal, Gamma, Beta),

LECTURE 9&10

Introductory Harmonic Analysis (Complex Fourier Series and
weaknesses, Wavelets, the Daubechies wavelets a d MRA for signals)