APPLIED MATHEMATICS 415
"MATHEMATICAL METHODS"

Calendar Description: H(3-1T)

> Mathematical analysis of linear systems. Fourier and Laplace transforms, applications and numerical methods. Functions of a complex variable and applications.

Prerequisite: One of Applied Mathematics 311 307, Mathematics 331, 353 or Applied Mathematics 309.

Syllabus

Topics	Number of Hours
Complex numbers. Limits. Continuity. Differentiability. Analytic functions. Elementary functions. Real integrals of complex functions.	4
Trigonometric polynomials. Approximation by trigonometric polynomials. Fourier series. Discrete Fourier transform	8
Complex integrals. Cauchy's integral theorem. Cauchy's integral formula.	4
Series of real and complex functions. Convergence tests. Taylor, McLaurin, Laurent series. Properties of zeros and poles.	5
Sequence spaces. The z-transform and its inverse. Discrete linear systems and filters. Convolution. Frequency analysis. Special purpose filters.	7
Improper integrals. Continuous linear systems and filters. Integration by the method of residues. Laplace and Fourier transforms and their inverses. Frequency analysis. Special purpose filters.	8
TOTAL HOURS	**36**

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