

P4820 Final Exam Study List

Winter 2019

Exam is Thursday, April 11 at 9:00 in C2039

Laplace transforms: definition, exponential order, Gamma function, properties (linear, derivative, attenuation, shifting), application (to de's), periodic functions, convolution, Mellin inversion integral.

Delta functions: delta sequence, sifting property, derivative of δ , delta function of a function, describing physical quantities with (ie. a sheet of charge or mass) in various coordinate systems, integral of.

Distributions: test function, core function, weak convergence, smudging theorem, properties (linearity etc.), derivative of, application to Green's function.

Sturm-Liouville theory: relation to separation of variables, be "familiar" with basic form and Neuman and Dirichlet conditions, eigen values (which must be real), degeneracy, eigen functions, orthogonality, Laplaces equation (in spherical coordinates), (associated) Legendre equation, Legendre polynomials, Generating function, spherical harmonics, Bessel functions.

Final Exam Format:

Six questions, grade will be based on the best 5 of 6.

Subject to change: basic SL problem, problem involving derivation of Legendre polynomials, problem based on Laplaces equation in cylindrical coordinate system (Bessel), Laplace transform problem (similar to one from midterms ... no circuits), charge distribution (type) problem, and delta function/distribution problem.