ME 6200 Mathematical Methods for Mechanical Engineers 1 (4SH): *(Offered fall and spring semesters and online)* Focuses on ordinary differential equations (ODEs) with mechanical engineering applications, linear algebra, and vector analysis. Topics include Laplace transform, power series, Fourier series, numerical methods for ODEs, matrices, finite dimensional linear vector spaces, eigenvalue problems, applications to systems of ODEs, vector field theory, curvilinear coordinates, and integral theorems. • Prerequisite: Engineering students only.

This course is mainly for those students needing a refresher and some extension of the topics in UG ODEs (includes power series and Laplace Transform,) Linear Algebra and Vector Field Theory (emphasis on curvilinear systems, integral theorems). There is no treatment of PDEs, Fourier Series, Sturm-Liouville problems, complex variables beyond elementary complex algebra. etc.

Directed toward the new MS student, PhD students without an MS and advanced undergraduates.

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ME 6201 Mathematical Methods for Mechanical Engineers 2 (4 SH) *(Offered Spring Semester)* Focuses on partial differential equations with applications to mechanical engineering. Includes function spaces; Sturm-Liouville theory; eigenfunction expansions; special functions; potential theory; solution of elliptic, parabolic, and hyperbolic PDEs using separation of variables; eigenfunction expansions, transform methods, and numerical methods. • Prerequisite: ME 6200 (or permission of the instructor).

Mainly for new PhD students, some MS students with the proper UG background. The student should be very comfortable with ODEs and vectors, and have some knowledge of linear algebra of finite dimensional vector spaces (or at least matrices and linear equations).

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ME 7205 Advanced Mathematical Methods for Mechanical Engineers (4 SH) *(Offered fall semester)* Covers applications to applied mechanics and thermal science problems in advanced engineering applications. Topics may include complex variables, analytic functions, Laurent and Taylor series, singularities, branch points, and contour integration. Additional topics may include generalized functions and integral transforms; variational calculus and applications; and approximate methods of engineering analysis, including asymptotic expansions, perturbation methods, and weighted residual methods. • Prerequisite: ME 6200; engineering students only.

Mainly for PhD students but students with proper background may take the course as well

**Course Instructors AY 2013-2014**

ME 6200 (in class) Fall 2013 Professors Cipolla and Satvat
ME 6200 (on line if enrollments are sufficient)) Fall 2013 Professor Dressler
ME 6200 (in class and/or online) Spring 2014 Instructor and mode to be determined
ME 6201 (in class) Spring 2014: Professor Cipolla
ME 7205 (In class) Fall 2013 Professor Cipolla

*Usually MS students take ME 6200 in their first semester of enrollment. If you are uncertain, please communicate with Professor Cipolla about which course is most appropriate for you.*