Mathematics Requirements in Aero/Astro

Each Aero/Astro degree has a math requirement, for which courses on the following list are pre-approved. (Other advanced courses may also be acceptable.) Students should consult with their advisors in selecting the most appropriate classes for their field. M.S. and Engineer candidates select 2 courses (at least 6 units). Ph.D. candidates select 3 courses, with at least 6 units from courses numbered above 200. <u>Note</u>: Courses with the same "footnote" cannot be combined, e.g., both Math 113 (*) and ME 300A (*)

Course Number	Course Name	Unit Count
AA 203	Optimal and Learning-based Control	3
AA 212	Advanced Feedback Control Design	3
AA 214	Numerical Methods for Compressible Flows	3
AA 222	Introduction to Multidisciplinary Design Optimization	3 - 4
AA 228 (CS 238)	Decision Making under Uncertainty	3 - 4
AA 242B (ME 242B)	Mechanical Vibrations	3
AA 273	State Estimation and Filtering for Robotic Perception	3
AA 277	Multi-robot Control, Communication, and Sensing	3
CEE 281	Mechanics and Finite Elements	3
CME 108 (MATH 114)	Introduction to Scientific Computing	3 - 4
CME 302	Numerical Linear Algebra	3
CME 303 (MATH 220)	Partial Differential Equations of Applied Mathematics	3
CME 306 (MATH 226)	Numerical Solution of Partial Differential Equations	3
CME 307 (MS&E311)	Optimization	3
CME 308 (MATH 228, MS&E 324)	Stochastic Methods in Engineering	3
CS 221	Artificial Intelligence: Principles and Techniques	3 - 4
CS 229 (STATS 229)	Machine Learning	3 - 4
EE 261	Fourier Transform and its Applications	3
EE 263	Introduction to Linear Dynamical Systems	3
EE 264	Digital Signal Processing	3 - 4
EE 266 (MS&E 251)	Introduction to Stochastic Control with Applications	3
EE 278	Introduction to Statistical Signal Processing	3
EE 364A	Convex Optimization I	3
EE 364B	Convex Optimization II	3
ENGR 209A	Analysis and Control of Nonlinear Systems	3
MS&E 201	Dynamic Systems	3 - 4
MS&E 221	Stochastic Modeling	3
MS&E 311	Optimization	3
MS&E 351	Dynamic Programming and Stochastic Control	3
MATH 113	Linear Algebra and Matrix Theory	3
MATH 115	Functions of a Real Variable	3
MATH 120	Groups and Rings	3
MATH 171	Fundamental Concepts of Analysis	3
* MATH 2xx	All Math courses over 200 will qualify (except seminars)	
ME 300A (CME 200)	Linear Algebra with Application to Engineering Computations	3
ME 300B (CME 204)	Partial Differential Equations in Engineering	3
ME 300C (CME 206)	Introduction to Numerical Methods for Engineering	3
ME 335A	Finite Element Analysis	3
* ME 335B	Finite Element Analysis	3
# ME 335C	Finite Element Analysis	3
ME 408 (CME 322)	Spectral Methods in Computational Physics	3
ME 469	Computational Methods in Fluid Mechanics	3
PHYSICS 211	Continuum Mechanics	3
STATS 110	Statistical Methods in Engineering and the Physical Sciences	4 - 5
STATS 116	Theory of Probability (not recommended as Ph.D. math - take 110)	3 - 5
STATS 217	Introduction to Stochastic Processes I	2 - 3