Graduate Math Class Requirements in
Aerospace Engineering and Engineering Mechanics

Mathematics is an important component of engineering. It is recommended that the student take a course to satisfy the Math requirement from the Math Department. The approach a mathematician takes to solving problems is different from that of an engineer, and this difference is a worthwhile part of a student’s education. However, for scheduling purposes or because of a student’s background, certain engineering or other technical courses can count for Math credit.

MS non-thesis option: 6 credits (2 courses) required, GE ACE students get 3 credits from B course. The list of substitute courses below can be used to satisfy the Math requirement.

MS Thesis Option: 3 credits (1 course). Only the recommended and other approved math courses plus the courses in the substitute list with a star can count.

PhD: 6 credits (2 courses) from a BS or 3 credits (1 course) from an MS. If two are required, then for one course, any math or substitute course can count. For the second course (or sole course if coming with and MS), only the recommended and other approved math courses plus the courses in the substitute list with a star can count.

**Recommended MATH courses:**

**Typically in Fall Semester**
- MATH6006 Numerical Analysis
- MATH6008 Applied Probability and Stochastic Processes
- MATH6012 Applied Linear Algebra
- MATH6051 Applied Ordinary Differential Equations

**Typically in Spring Semester:**
- MATH 6007 PDE and Fourier Analysis

**Other Approved Math Courses Especially for PhD students (both Fall and Spring)**
While those listed below are approved for Math credits, they are more theoretical and are generally taken by Math graduate students. Please check with your advisor before registering for any course listed below.

- MATH6001 Advanced Calculus I
- MATH6002 Advanced Calculus II
- MATH6003 Abstract Linear Algebra
- MATH6005 Introduction to Complex Analysis
- MATH7001 Complex Analysis
- MATH7002 Real Analysis
- MATH7004 Topology
- MATH7005 Ordinary Differential Equations
- MATH7006 Partial Differential Equations
- MATH7011 Advanced Mathematical Modeling
- MATH7073 Probability and Statistical Inference
Courses generally approved for MATH substitution (MS non-thesis and only one of the PhD math classes, the starred courses can count for MS thesis requirement and second PhD course):

**Typically in Fall Semester**
- AEEM 6015^ Modern Control (see below)
- AEEM 6022 Optimal Control
- AEEM 7074* Advanced Finite Element Method
- BANA 6035 Simulation Modeling
- BANA 7031 Probability Models
- BANA 7041 Statistical Methods
- EECE 6019* Probability and Random Processes
- EECE 6024 Introduction to Digital Signal Processing
- EECE 6043 Optimization Methods and Models
- EECE 7033^ Linear Systems Theory (see below)
- EGFD 7051* Numerical Methods in Aerospace Fluid Mechanics
- MECH 6060 Applied Fast Fourier Transforms
- MECH 7054 Boundary Element Methods
- MECH 7062 System Dynamic Analysis
- MECH 7090* Conduction Heat Transfer
- PHYS 7001 Mathematical Physics (must get approval for out of college course)

- STAT 6021 Mathematical Statistics I
- STAT 6031 Applied Statistics I
- MATH 6015 Mathematical Programming

**Typically in Spring Semester**
- BE 7061 Biostatistics in Research
- BE 7088 Regression Analysis
- BME 7061 Biostatistics in Research
- ENVE 6027 Mathematical Principles of Environmental Systems
- MECH 6004 Monte Carlo Methods
- MECH 6011 Computational Design
- MTEN 6090 Molecular Modeling

A special topics class that has a large Math content may also count

Much of this list comes from the Mechanical Engineering Department list, and it is appreciated.

^ AEEM 6015 Modern Control or EECE 7033 Linear Systems Theory cannot count toward a Math requirement if Applied Linear Algebra is also taken for a Math requirement (possible for a non-thesis MS (not GE) or PhD student)