Graduate Mathematics Requirement
Department of Aeronautics and Astronautics
July 16, 2019

The purpose of the graduate math requirement is to give students exposure to advanced mathematical concepts at the graduate level. Although mathematics is an integral part of all engineering curricula, it is our experience that additional math subjects can add significantly to the student's problem solving capabilities.

The Department's policy regarding the math requirement is as follows. For SM students, 12 units of total credit are required. For PhD students, 24 units of total credit are required. The following subjects may be used to fulfill the graduate math requirement:

1. Any subject offered by the Department of Mathematics designated as <u>graduate level</u> for students who are not Mathematics majors.

2. Selected subjects offered by departments other than Mathematics can also be used toward the math requirement. The list of acceptable subject is as follows:

<u>A. Probability and Statistics</u>
1.151 Probability and Statistics in Engineering; 3-0-9
6.262 Discrete Stochastic Processes; 3-0-9
6.265J/15.070 Advanced Stochastic Processes; 3-0-9
6.431A&B Intro to Probability; 4-0-8 (Must take A & B)
6.436J/15.085 Fundamentals of Probability; 4-0-8
14.382 Econometrics I; 4-0-8
16.391J/6.434J Statistics for Engineers and Scientists; 3-0-9
16.470J/ESD.756J Statistical Methods in Experimental Design; 3-0-9
HST.191 Intro to Biostatistics and Epidemiology; 3-0-3
IDS.147/15.077 Statistical Learning and Data Mining; 4-0-8
IDS.700/1.203/15.073 Applied Probability and Stochastic Modeling; 3-0-9

<u>B. Optimization</u>
6.251J/15.081J/Intro to Mathematical Programming; 4-0-8
15.083J/6.859J Integer Programming and Combinatorial Optimization; 3-0-9
15.084J/6.252J Nonlinear Optimization; 3-0-9
15.093J//6.255J Optimization Methods; 4-0-8
15.094J/1.142J Robust Modeling, Optimization & Computation 4-0-8

<u>C. Numerical Methods</u>
16.910J/2.096J/6.336J Intro to Numerical Simulation; 3-0-9
16.920J/ 2.097J/6.339J Numerical Methods for Partial Differential Equations; 3-0-9
16.940 Numerical Methods for Stochastic Modeling & Inference; 3-0-9

In cases where a Course 16 subject is jointly listed, AeroAstro students would register under the Course 16 number. Also, please check the current MIT Course Catalogue for course descriptions and years offered.

For PhD students, the subjects used to fulfill this math requirement may also be used in the student's major and minor program (subject to approval by the student's doctoral committee and, if appropriate, minor advisor). Further, subjects from an SM earned at MIT can be used to satisfy this PhD math requirement. Subjects from an SM earned outside MIT potentially can be used to satisfy the PhD requirement; in this case, the student can submit these subjects to the department's Graduate Committee for approval to waive ONE of TWO required classes (see attached form).

External Subject Request for PhD Mathematics Requirement
Department of Aeronautics & Astronautics

The purpose of this form is to request the use of a graduate-level mathematics subject from outside MIT towards the doctoral graduate mathematics requirement in Aero/Astro.

Subject name:

University at which subject was taken:

Subject number or identifier:

Grade received in subject:

Textbook(s):

MIT subject(s) that are similar:

Justification of why this course should be counted:

Please also attach to this request:
        Official transcript from university at which subject was taken
        Syllabus of subject including list of topics covered

Graduate Committee Response:

Reduction of Graduate Mathematics Requirement (in terms of units):