

## MATHEMATICS (COURSE 18)

### Bachelor of Science in Mathematics (Pure Mathematics Option)

#### General Institute Requirements (GIRs)

The General Institute Requirements include a Communication Requirement that is integrated into both the HASS Requirement and the requirements of each major; see details below.

Summary of Subject Requirements	Subjects
Science Requirement	6
Humanities, Arts, and Social Sciences (HASS) Requirement; at least two of these subjects must be designated as communication-intensive (CI-H) to fulfill the Communication Requirement.	8
Restricted Electives in Science and Technology (REST) Requirement [one subject can be satisfied by 18.03 in the Departmental Program]	2
Laboratory Requirement (12 units)	1
<b>Total GIR Subjects Required for SB Degree</b>	<b>17</b>

#### Physical Education Requirement

Swimming requirement, plus four physical education courses for eight points.

#### Departmental Program

Choose at least two subjects in the major that are designated as communication-intensive (CI-M) to fulfill the Communication Requirement.

Required Subjects	Units
18.03 Differential Equations <sup>1</sup>	12
18.100B Real Analysis <sup>2</sup>	12
18.701 Algebra I	12
18.702 Algebra II	12
18.901 Introduction to Topology	12
<b>Restricted Electives</b>	
<i>Select one of the following:</i>	12
18.101 Analysis and Manifolds	
18.102 Introduction to Functional Analysis	
18.103 Fourier Analysis: Theory and Applications	
<i>Select one undergraduate seminar from the following:</i>	12
18.104 Seminar in Analysis (CI-M)	
18.504 Seminar in Logic (CI-M)	
18.704 Seminar in Algebra (CI-M)	
18.784 Seminar in Number Theory (CI-M)	

18.904 Seminar in Topology (CI-M)	
18.994 Seminar in Geometry (CI-M)	
Select two additional 12-unit Course 18 subjects of essentially different content, with the first decimal digit one or higher	24
<b>Units in Major</b>	<b>108</b>
<b>Unrestricted Electives</b>	<b>84</b>
Units in Major That Also Satisfy the GIRs	(12)
<b>Total Units Beyond the GIRs Required for SB Degree</b>	<b>180</b>

The units for any subject that counts as one of the 17 GIR subjects cannot also be counted as units required beyond the GIRs.

<sup>1</sup> Students may substitute one of the more advanced subjects 18.152 *Introduction to Partial Differential Equations* or 18.303 *Linear Partial Differential Equations: Analysis and Numerics* for 18.03. 18.032 *Differential Equations, which places more emphasis on theory, is also an acceptable option.*

<sup>2</sup> Alternate versions of this subject, 18.100A, 18.100P and 18.100Q, also satisfy this requirement.

#### Communication-Intensive Subjects in the Major

To satisfy the requirement that students take two CI-M subjects, students must select one of the following options:

##### Option A

Select two of the following:

18.104 Seminar in Analysis	
18.204 Undergraduate Seminar in Discrete Mathematics	
18.384 Undergraduate Seminar in Physical Mathematics	
18.424 Seminar in Information Theory	
18.434 Seminar in Theoretical Computer Science	
18.504 Seminar in Logic	
18.704 Seminar in Algebra	
18.784 Seminar in Number Theory	
18.821 Project Laboratory in Mathematics	
18.904 Seminar in Topology	
18.994 Seminar in Geometry	

##### Option B

Select one subject from Option A and one of the following:

8.06 Quantum Physics III	
14.33 Research and Communication in Economics: Topics, Methods, and Implementation	
18.100P Real Analysis	
18.100Q Real Analysis	

**MATHEMATICS (COURSE 18)**

**18.200** Principles of Discrete Applied  
Mathematics