Department of Mathematics (http://catalog.mit.edu/schools/science/mathematics/#undergraduatetext)

Bachelor of Science in Mathematics (General Mathematics Option)

**General Institute Requirements (GIRs)**

<table>
<thead>
<tr>
<th>Summary of Subject Requirements</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science Requirement</td>
<td>6</td>
</tr>
<tr>
<td>Humanities, Arts, and Social Sciences (HASS) Requirement</td>
<td>8</td>
</tr>
<tr>
<td>Restricted Electives in Science and Technology (REST) Requirement [one subject can be satisfied by 18.03 in the Departmental Program]</td>
<td>2</td>
</tr>
<tr>
<td>Laboratory Requirement</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total GIR Subjects Required for SB Degree</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

**Communication Requirement**

2 subjects designated as communication-intensive in Humanities, Arts, and Social Sciences (CI-H; see HASS Requirement, above)

2 subjects designated as communication-intensive in the Major (CI-M; see departmental program, below)

**Physical Education Requirement**

Swimming requirement, plus four physical education courses for eight points (See Physical Education Requirement for details.)

**Departmental Program**

<table>
<thead>
<tr>
<th>Required Subjects</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.03 Diff. Equations</td>
<td>12</td>
</tr>
</tbody>
</table>

**Restricted Electives**

Select eight 12-unit subjects of essentially different content, including at least six advanced subjects (first decimal digit one or higher). One of these eight subjects must be one of the following:

- 18.06 Linear Algebra
- 18.700 Linear Algebra
- 18.701 Algebra I

**Unrestricted Electives**

Select 84 units

**Total Units**

192

**Departmental Program Units That Also Satisfy the GIRs**

12

**Total Units Beyond the GIRs Required for SB Degree**

180

No subject can be counted both as part of the 17-subject GIRs and as part of the 180–198 units required beyond the GIRs. Every subject in the student’s departmental program will count toward one or the other, but not both.

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, 18.034 Differential Equations, which places more emphasis on theory, is also an acceptable option.

**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
- 18.100C Real Analysis
- 18.200 Principles of Discrete Applied Mathematics
### Bachelor of Science in Mathematics (Applied Mathematics Option)

#### General Institute Requirements (GIRs)

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<tr>
<td>Restricted Electives in Science and Technology (REST) Requirement [one subject can be satisfied by 18.03 in the Departmental Program]</td>
<td>2</td>
</tr>
<tr>
<td>Laboratory Requirement</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total GIR Subjects Required for SB Degree</strong></td>
<td><strong>17</strong></td>
</tr>
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</table>

#### Communication Requirement

- 2 subjects designated as communication-intensive in Humanities, Arts, and Social Sciences (CI-H; see HASS Requirement, above)
- 2 subjects designated as communication-intensive in the Major (CI-M; see departmental program, below)

#### Physical Education Requirement

Swimming requirement, plus four physical education courses for eight points (See Physical Education Requirement for details.)

#### Departmental Program

<table>
<thead>
<tr>
<th>Required Subjects</th>
<th>Units</th>
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<tbody>
<tr>
<td>18.03 Differential Equations</td>
<td>12</td>
</tr>
<tr>
<td>18.04 Complex Variables with Applications</td>
<td>12</td>
</tr>
<tr>
<td>18.112 Functions of a Complex Variable</td>
<td>12</td>
</tr>
<tr>
<td>18.06 Linear Algebra</td>
<td>12</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>12-15</td>
</tr>
<tr>
<td>18.200 Principles of Discrete Applied Mathematics (15 units, CI-M)</td>
<td></td>
</tr>
<tr>
<td>18.200A Principles of Discrete Applied Mathematics (12 units)</td>
<td></td>
</tr>
<tr>
<td>18.300 Principles of Continuum Applied Mathematics</td>
<td>12</td>
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</table>

**Restricted Electives**

Select four additional 12-unit Course 18 subjects from the following two groups with at least one subject from each group: ³

- Group I: Probability and statistics, combinatorics, computer science
- Group II: Numerical analysis, physical mathematics, nonlinear dynamics

**Unrestricted Electives**

Select 81-84 units

<table>
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<th>Total Units</th>
<th>192</th>
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<td>Departmental Program Units That Also Satisfy the GIRs</td>
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No subject can be counted both as part of the 17-subject GIRs and as part of the 180–198 units required beyond the GIRs. Every subject in the student’s departmental program will count toward one or the other, but not both.

³ 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. 18.034 Differential Equations, which places more emphasis on theory, is also an acceptable option.

² Students may substitute 18.700 Linear Algebra, which places more emphasis on theory and proofs, or the more advanced subject, 18.701 Algebra I.

³ A list of acceptable subjects is available from Math Academic Services and on the department’s website (http://math.mit.edu).

#### 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
- 18.100C Real Analysis
| 18.200 | Principles of Discrete Applied Mathematics |
**Bachelor of Science in Mathematics (Theoretical Mathematics Option)**

**General Institute Requirements (GIRs)**

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**Total GIR Subjects Required for SB Degree** 17

**Communication Requirement**

- 2 subjects designated as communication-intensive in Humanities, Arts, and Social Sciences (CI-H; see HASS Requirement, above)
- 2 subjects designated as communication-intensive in the Major (CI-M; see departmental program, below)

**Physical Education Requirement**

Swimming requirement, plus four physical education courses for eight points (See Physical Education Requirement for details.)

**Departmental Program**

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<td>18.100B Real Analysis ²</td>
<td>12</td>
</tr>
<tr>
<td>18.701 Algebra I</td>
<td>12</td>
</tr>
<tr>
<td>18.702 Algebra II</td>
<td>12</td>
</tr>
<tr>
<td>18.901 Introduction to Topology</td>
<td>12</td>
</tr>
</tbody>
</table>

**Restricted Electives**

Select one of the following: 12

18.101 Analysis and Manifolds
18.102 Introduction to Functional Analysis
18.103 Fourier Analysis: Theory and Applications

Select one undergraduate seminar from the following: 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

**Unrestricted Electives**

Select 84 units

**Total Units** 192

Departmental Program Units That Also Satisfy the GIRs (12)

**Total Units Beyond the GIRs Required for SB Degree** 180

No subject can be counted both as part of the 17-subject GIRs and as part of the 180–198 units required beyond the GIRs. Every subject in the student’s departmental program will count toward one or the other, but not both.

¹ 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. 18.034 Differential Equations, which places more emphasis on theory, is also an acceptable option.

² Alternate versions of this subject, 18.100A and 18.100C, 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
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- 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

18.100C Real Analysis
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