Your program must be approved by your adviser. Prior to meeting with your advisor, decide on one or more options for the additional upper division units and pencil in the tentative selections and schedule of coursework on the appropriate major planning sheet. One copy of this sheet, after approval by your adviser, will be kept in your file in the Student Services Office. Afterwards, deviations may be made only upon approval by your adviser. Substitutions of other mathematics courses or mathematically oriented courses offered by other departments for the required upper division courses listed above is permissible only with the approval of the Undergraduate Program Committee.

BS – Applied Mathematics

**Preparatory Subject Matter** 42 - 52

- MAT 12 (or high school equivalent) ................................................................. 0 – 3
- MAT 21A, 21B, 21C, 21D, 22B, 25 ................................................................. 23
- MAT 67, or 22A and 108 ........................................................................... 4 – 7
- MAT 22AL or equivalent basic knowledge of MATLAB ...................... 0 – 1
- ECS 30, 40 ................................................................................................... 8

One two-quarter sequence from PHY 9AB; BIS 2AB, CHE 2AB; ECN 1AB; STA 32, 100; or other applied preparatory courses approved by your adviser................................................................. 7 – 10

**NOTE:** Basic knowledge of MATLAB is required for both 22A and 67. Students can learn it on their own, enroll in ENG 6, or in the one unit course MAT 22AL (can be taken concurrently).

**Depth Subject Matter** 48 - 52

**A. Entry Level (Optional) ................................................................. 0 – 4**

(Choices: 1 course from MAT 108, 114, 115A, 141, 145)

**B. Core ........................................................................................................... 32**

- MAT 150A ........................................................................................................... 4
- MAT 135A ........................................................................................................... 4
- MAT 125AB ........................................................................................................ 8
- MAT 119A ........................................................................................................... 4
- MAT 128AB ........................................................................................................ 8
- MAT 185A ........................................................................................................... 4

**C. Enrichment Courses .......................................................................................... 16**

2. Choice of 1 course from MAT 111, 114, 115A, 116, 135B,141, 145, 146, 147, 148, 150B, 165, 185B ......................................................... 4
3. One approved* upper division course outside the Department of Mathematics with extensive use of mathematics ......................................................... 4

**Total units for the Major ......................................................................................... 90 – 104**

* See individual planning sheet for list of courses outside of Mathematics
BS – Mathematics

**Preparatory Subject Matter**

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 12 (or high school equivalent)</td>
<td>0 – 3</td>
</tr>
<tr>
<td>MAT 21A, 21B, 21C, 21D, 22B, 23</td>
<td>23</td>
</tr>
<tr>
<td>MAT 67, or MAT 22A and 108</td>
<td>4 – 7</td>
</tr>
<tr>
<td>ECS 30, 22AL (or equivalent MATLAB knowledge) or ENG 6</td>
<td>4 – 5</td>
</tr>
<tr>
<td>PHY 9 A (Plans 1 &amp; 2) or 1 course from PHY 7A, STA 13, 32, 100 or 102 (Plan 2)</td>
<td>3 – 4</td>
</tr>
</tbody>
</table>

**NOTE:** Basic knowledge of MATLAB is required for both 22A and 67. Students can learn it on their own, enroll in ENG 6, or in the one unit course MAT 22AL (can be taken concurrently).

**Depth Subject Matter**

**Plan 1: General Mathematics**

_A. Entry Level (Optional)_

(Choices: 1 course from MAT 108, 114, 115A, 141, 145)

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 150ABC</td>
<td>12</td>
</tr>
<tr>
<td>MAT 135A</td>
<td>4</td>
</tr>
<tr>
<td>MAT 125AB</td>
<td>8</td>
</tr>
<tr>
<td>MAT 185A</td>
<td>4</td>
</tr>
</tbody>
</table>

_B. Core_ .................................................. 28

_C. Enrichment_ ........................................... 20

2. Choice of 1 course from MAT 119A, 124, 128A, 128B, 129, 133, 167, 168, or 1 approved* upper division course outside the Dept. of Mathematics with extensive use of mathematics ................. 4

**Plan 2: Mathematics for Secondary Teaching**

_A. Entry Level (Optional)_

(Choices: 1 course from MAT 108, 114, 145)

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 150A</td>
<td>4</td>
</tr>
<tr>
<td>MAT 135A</td>
<td>4</td>
</tr>
<tr>
<td>MAT 125AB</td>
<td>8</td>
</tr>
<tr>
<td>MAT 111</td>
<td>4</td>
</tr>
<tr>
<td>MAT 115A</td>
<td>4</td>
</tr>
<tr>
<td>MAT 141</td>
<td>4</td>
</tr>
</tbody>
</table>

_B. Core_ .................................................. 28

_C. Enrichment_ ........................................... 20

1. Choice of 4 courses from MAT 114, 116, 118A, 119AB, 128A, 129, 133, 135B, 145, 147, 148, 165, 167, 168, 185AB. Up to 4 units can be approved* upper division units outside the Dept. of Mathematics with extensive use of mathematics ........................................... 16
2. Choice of 1 course from MAT 115B, 146, 150B .................................................. 4

**Total units for the Major** .................................................. 82 – 94

* See individual planning sheet for list of courses outside of Mathematics

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For use with 2012-2014 catalog
**BS – Mathematical and Scientific Computation**

### Preparatory Subject Matter

36 - 42

- MAT 12 (or high school equivalent) ................................................................. 0 – 3
- MAT 21ABC or MAT 17ABC, 21D, 22B, 25 ................................................................. 23
- MAT 67, or 22A and 108 ...................................................................................... 4 – 7
- MAT 22AL or equivalent basic knowledge of MATLAB ........................................... 0 – 1
- ECS 30, 40 .................................................................................................................. 8

**NOTE:** Basic knowledge of MATLAB is required for both 22A and 67. Students can learn it on their own, enroll in ENG 6, or in the one unit course MAT 22AL (can be taken concurrently).

### Depth Subject Matter

48 - 52

**A. Entry Level (Optional)** ...................................................................................... 0 – 4

(Choices: 1 course from MAT 108, 114, 115A, 141, 145)

**B. Core** .................................................................................................................. 28

- MAT 150A ....................................................................................................................... 4
- MAT 135A ....................................................................................................................... 4
- MAT 125AB ..................................................................................................................... 8
- MAT 128ABC .................................................................................................................. 12

**C. Enrichment** ...................................................................................................... 12

1. Choice of 2 courses from MAT 118ABC, 119AB, 129, 133, 167, 185A............................ 8
2. Choice of 1 course from MAT 111, 114, 115A, 116, 135B, 141, 145,

146, 147, 148, 150B, 165................................................................................................. 4

**D. Choose 1 Emphasis from the following 2:** ...................................................... 8

- **Computational & Mathematical Biology Emphasis**
  - MAT 124 .................................................................................................................... 4
  - One approved* upper division course in Biology ....................................................... 4

- **Computational & Mathematics Emphasis**
  - MAT 168 .................................................................................................................... 4
  - One approved* upper division course involving extensive computation
  or theory of computation .................................................................................................... 4

**Total units for the Major** ..................................................................................... 84 - 94

* See individual planning sheet for list of approved courses outside of Mathematics
AB – Mathematics

**Preparatory Subject Matter** 43 -50
- MAT 12 (or high school equivalent) ................................................................. 0 – 3
- MAT 21A, 21B, 21C, 21D, 22B, 25 ................................................................. 19
- MAT 67, or 22A and 108 ............................................................................. 4 – 7
- ECS 30, MAT 22AL (or equivalent MATLAB knowledge) or ENG 6........... 4 – 5
- Additional non-Mathematics courses chosen from natural sciences .......... 12

**NOTE:** Basic knowledge of MATLAB is required for both 22A and 67. Students can learn it on their own, enroll in ENG 6, or in the one unit course MAT 22AL (can be taken concurrently).

**Depth Subject Matter** 34 - 38

A. Entry Level (Optional) .................................................................................. 0 – 4
(Choices: 1 course from MAT 108, 114, 115A, 141, 145)

B. Core .............................................................................................................. 16
- MAT 125AB ..................................................................................................... 8
- MAT 135A ....................................................................................................... 4
- MAT 150A ....................................................................................................... 4

C. Choose 1 Plan from the following 2:
(up to 4 of these 18 units may be approved* upper division courses
outside of the Dept of Mathematics with extensive use of mathematics .......... 18

Plan 1: General Mathematics
Additional upper division mathematics units selected in consultation with
and subject to approval of an adviser ............................................................... 18

Plan 2: Secondary Teaching
- MAT 111 ........................................................................................................ 4
- MAT 115A ....................................................................................................... 4
- MAT 141 ........................................................................................................ 4
Additional upper division mathematics units selected in consultation with
and subject to approval of an adviser .............................................................. 6

**NOTE:** Students who wish to satisfy the single subject matter waiver for the
teaching credential should see an adviser as early as possible. For list of courses
that satisfy the Math Single Subject Matter Waiver, see the individual planning
sheet for this major.

**Total units for the Major** ........................................................................... 77 - 88

* See individual planning sheet for list of courses outside of Mathematics.