PRE-BIOLOGICAL SCIENCES MAJOR, 2017-2018

Students are not admitted directly to the following majors:

- Biological Sciences, B.A. or B.S.
- Biochemistry-Molecular Biology, B.S.
- Cell and Developmental Biology, B.S.
- Microbiology, B.S.
- Pharmacology, B.S.
- Aquatic Biology, B.S.
- Ecology and Evolution, B.S.
- Physiology, B.S.
- Zoology, B.S.

Instead, they are first admitted to the Pre-Biology major, and they may advance to full major standing in one of these majors only after fulfilling the pre-major courses and grade requirements listed below. Students will not be admitted to the pre-biology major after their seventh quarter (or equivalent), and students will only be admitted to the pre-major in their seventh quarter if they have completed introductory biology and most of the required pre-biology major courses.

Note: Completion of the pre-major does not fully satisfy the Preparation for the Major requirements for any of the majors. Students should review the full requirement sheet for the major they intend to declare and plan their schedules accordingly. Also note, acceptance into the pre-major does not guarantee admission to full major status.

Students may petition for advancement to full major status in any one of the majors as soon as they have completed the required minimum of twelve courses with a 2.0 higher UC GPA in Area B, in Area C, and in Areas A and D combined. At the time of the petition, they must also have a 2.0 or higher grade-point average in all courses attempted toward the major (preparation and upper-division).

Note: Many upper-division EEMB and all MCDB courses require a C or higher in each of their prerequisite courses. See General Catalog for details.

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UNITS YET TO COMPLETE

A. General Chemistry: Chemistry 1A or 2A, 1B or 2B, 1C or 2C
   (The entire three-quarter series and laboratories are required for all EEMB and MCDB majors.) .......................................................... 9

B. MCDB 1A, MCDB 1B, EEMB 2, EEMB 3 ........................................................................ 13

C. MCDB 1AL, either MCDB 1BL or EEMB 2L, EEMB 3L ........................................... 3

D. Two courses from the following: .................................................................................. 6-9

Organic Chemistry lecture: Chemistry 109A-B-C or Chemistry 109AH-BH-CH
   (Not required for Ecology and Evolution or Zoology. Other majors add laboratory requirements
to lecture. Physiology and the MCDB majors require the entire 109 A-B-C or honors sequence. Aquatic
Biology, Biological Science B.A. and B.S. majors require 109A-B or 109AH-BH.)

Calculus: Mathematics 3A or 34A, 3B or 34B
   (Biochemistry-Molecular Biology requires Math 3A-B and beyond. The other majors give a choice of 3A-B or
34A-B.)

Statistics or Advanced Calculus: PSTAT 5LS or 5A or Math 4A (PSTAT 5LS or 5A strongly recommended for
EEMB majors. Biochemistry-Molecular Biology requires Math 4A and Math 6A.)

Physics: 6A-B-C
   (Biological Sciences B.A. does not require 6C. Laboratories are required for all majors.)

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MAJOR REGULATIONS

PREREQUISITES .............................................................................................................. Check the General Catalog for the prerequisites to all listed courses.

P/NP GRADING OPTION .................................................................................................. Not allowed for any pre-major courses. All must be completed on a letter grade basis.

SUBSTITUTIONS .............................................................................................................. In the major requirements permissible only by petition to the department chair and dean.

RESIDENCE REQUIREMENTS ......................................................................................... At least 20 UD units in major while in residence at UCSB.

G.P.A. REQUIREMENTS .................................................................................................... At least 2.0 overall UC average in all upper-division major courses and all courses (Prep and UD) for
the major, including courses in excess of minimum requirements.

DOUBLE MAJORS ............................................................................................................. With the approval of each department chairperson, up to a total of 8 units may be applied
simultaneously to both UD majors.
BIOLOGICAL SCIENCES MAJOR, B.A. – 2017-2018

To be admitted to full major status, students must fulfill the pre-biology course and grade-point average requirements as described in the General Catalog and Pre-Biological Sciences Major Sheet. At minimum, they must complete twelve designated courses from the Preparation for the Major with a 2.0 or higher UC grade-point average. Grades earned must meet grade prerequisites for the full major.

Note: Hyphens indicate that an entire sequence must be completed as shown to fulfill an area requirement.

PREPARATION FOR THE MAJOR

<table>
<thead>
<tr>
<th>Course</th>
<th>Units Yet to Complete</th>
</tr>
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<tbody>
<tr>
<td>Chemistry 1A-AL-BL-C-CL or 2A-AC-B-BC-C-CC</td>
<td>15</td>
</tr>
<tr>
<td>MCDB 1A-1AL-1B, EEMB 2-3-3L, and either MCDB 1BL or EEMB 2L</td>
<td>16</td>
</tr>
<tr>
<td>(Transfer students must consult the advisor regarding selected topics to be covered in Z courses)</td>
<td></td>
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<tr>
<td>Chemistry 6AL-6BL (or 6BH) and 109A-B or 109AH-BH</td>
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</tr>
<tr>
<td>Mathematics 3A-B or 34A-B</td>
<td>8</td>
</tr>
<tr>
<td>One of the following: PSTAT 5LS or PSTAT 5A or Math 4A</td>
<td>4 or 5</td>
</tr>
<tr>
<td>Physics 6A-AL-BL</td>
<td>8</td>
</tr>
</tbody>
</table>

UPPER-DIVISION MAJOR

36 UD units: 36

Courses with an asterisk (*) are listed in more than one area, but they may be applied to only one area.

One course or course sequence is required in each of the areas below (A through F)

A. Genetics: one course from: MCDB 101A (MCDB 101B is strongly recommended) or EEMB 129

B. Physiology: one course from: MCDB 111, 151*; EEMB 126, 143, 154, 156, 157, 157C, 165

C. Developmental and Cell Biology or Biochemistry and Molecular Biology: one course from: MCDB 103, 108A (or W 108A), 110, 112, 118, 133, 134, 135, 146, 151*, 152, 153

D. Ecology or Evolution: one course from: EEMB 101, 102, 108, 109 (or Earth 148), 113-113L*, 119, 120, 127*, 128, 131 (or Earth 121), 136-136L (or Earth 111-111L), 137 (or Earth 141), 138, 140, 142A, 147, 148, 153, 155CC, 159, 168, 169, 171 (or Env S 171), 179, 180

E. Diversity of Form and Function: one course from: EEMB 103A, 106, 107, 111, 112, 113-113L*, 116, 118, 127*, 145, 163; MCDB 131, 139

F. Electives: Additional UD courses offered in EEMB and MCDB to bring the total to 36 units

Note: The following courses do not count toward upper-division major credit: EEMB 181, 182, 183, 184, 189; MCDB 121, 122, 123, 124, 194KF, 194KK, 194MD. In addition, no more than 4 units of the following courses combined will apply: EEMB 185-199; MCDB 185-199.

MAJOR REGULATIONS

PREREQUISITES

Check the General Catalog for the prerequisites to all listed courses.

P/NP GRADING OPTION

Not allowed for major courses (prep or UD), including courses applied to the major from other departments, except up to 4 units of courses that do not allow letter grades.

SUBSTITUTIONS

In the major requirements permissible only by petition to the department chair and dean.

RESIDENCE REQUIREMENTS

At least 20 UD units in major while in residence at UCSB.

G.F.A. REQUIREMENTS

At least 2.0 overall UC average in all upper-division major courses and all courses (Prep and UD) for the major, including courses in excess of minimum requirements.

DOUBLE MAJORS

With the approval of each department chairperson, up to a total of 8 units may be applied simultaneously to both UD majors.
**BIOLOGICAL SCIENCES MAJOR, B.S. – 2017-2018**

To be admitted to full major status, students must fulfill the pre-biology course and grade-point average requirements as described in the General Catalog and Pre-Biological Sciences Major Sheet. At minimum, they must complete twelve designated courses from the Preparation for the Major with a 2.0 or higher UC grade-point average. Grades earned must meet grade prerequisites for the full major.

**Notes:** Hyphens indicate an entire sequence must be completed as shown to fulfill an area requirement. A single course can satisfy only one requirement.

### PREPARATION FOR THE MAJOR

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<tr>
<td>Chemistry 1A-AL-B-CL-C-CL or 2A-AC-B-BC-C-CC</td>
<td>15</td>
</tr>
<tr>
<td>MCDB 1A-AL-1B, EEMB 2-3L, and either MCDB 1BL or EEMB 2L</td>
<td>16</td>
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<tr>
<td>(Transfer students must consult the advisor regarding selected topics to be covered in Z courses.)</td>
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<td>Chemistry 6AL-6BL (or 6BH) and 109A-B or 109AH-BH</td>
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</tr>
<tr>
<td>Mathematics 3A-B or 34A-B</td>
<td>8</td>
</tr>
<tr>
<td>One of the following: PSTAT 5A or PSTAT 5LS or Math 4A</td>
<td>.4 or 5</td>
</tr>
<tr>
<td>Physics 6AL-6BL-BC-CL</td>
<td>12</td>
</tr>
</tbody>
</table>

### UPPER-DIVISION MAJOR

48 UD units required, distributed as follows: 48 units.

Courses with an asterisk (*) are listed in more than one area, but they may be applied to only one area.

**A.** Genetics: One course sequence from: **MCDB 101A-B** (MCDB concentration) or **EEMB 129-130** or **EEMB 101** and **129** (EEMB concentration)

**B.** One course or course sequence from each of the following:

5. Evolution: **EEMB 101**, **102, 108, 109** (or Earth 148), **113-113L**, **127**, **131** (or Earth 121), **136-136L** (or Earth 111-111L), **137** (or Earth 141), **138, 180**
7. Laboratory: Either one of the underlined courses from sections 1-6 above or one of the following: **MCDB 101L, 103L, 109L, 112L, 126AL, 126BL, 131L, 132L, 133L, 140L, 161L; EEMB 107L, 127L, 142AL, 142BL, 142CL, 170**

**C.** Electives: Additional upper-division courses in EEMB and MCDB to bring the total to 48 units.

**Note:** The following courses do not count toward upper-division major credit: **EEMB 181, 182, 183, 184, 189; MCDB 121, 182, 183, 184, 194KF, 194KK, 194MD. In addition, no more than 8 units of the following courses combined will apply to the major:** **EEMB 185-199; MCDB 185-199.**

**MAJOR REGULATIONS**

**PREREQUISITES**

Check the General Catalog for the prerequisites to all listed courses.

**P/NP GRADING OPTION**

Not allowed for major courses (prep or UD), including courses applied to the major from other departments, except up to 8 units of courses that do not allow letter grades.

**SUBSTITUTIONS**

In the major requirements permissible only by petition to the department chair and dean.

**RESIDENCE REQUIREMENTS**

At least 20 UD units in major while in residence at UCSB.

**G.P.A REQUIREMENTS**

At least 2.0 overall UC average in all upper-division major courses and all courses (Prep and UD) for the major, including courses in excess of minimum requirements.

**DOUBLE MAJORS**

With the approval of each department chairperson, up to a total of 8 units may be applied simultaneously to both UD majors.
AQUATIC BIOLOGY MAJOR, B.S. – 2017-2018

To be admitted to full major status, students must fulfill the pre-biology course and grade-point average requirements as described in the General Catalog. At minimum, they must complete twelve designated courses from the Preparation for the Major with a 2.0 or higher UC grade-point average. Note: Hyphens indicate that an entire sequence must be completed as shown to fulfill an area requirement. A single course can satisfy only one requirement. Grades earned must meet the grade prerequisites for the full major.

PREPARATION FOR THE MAJOR

Chemistry 1A-AL-B-CL-BL-CL or 2A-AC-B-BC-C-CC ......................................................... 15
MCDB 1A-1AL-1B, EEMB 2-3-3L, and either MCDB 1BL or EEMB 2L .............. 16
(Transfer students must consult the advisor regarding selected topics to be covered in Z courses)
Chemistry 6AL-6BL (or 6BH) and 109A-B or 109AH-BH ........................................... 14
Mathematics 3A-B or 34A-B ......................................................................................... 8
One of the following: PSTAT 5LS or PSTAT 5A (Math 4A acceptable, but not recommended) .......... 4 or 5
Physics 6A-AL-B-CL-BL-CL ........................................................................... 12

UPPER-DIVISION MAJOR

48 UD units are required in biological sciences, distributed as follows: .......................... 48

Courses with an asterisk (*) are listed in more than one area, but they may be applied to only one area.

A. Core Curriculum: One course required from each of the following categories:
1. Ecology: EEMB 120 ...........................................................................................................
2. Evolution: EEMB 131 (or Earth 121) ..............................................................................
3. Genetics: EEMB 129 or MCDB 101A ............................................................................
4. Biometry: EEMB 146 ......................................................................................................

B. Area of Concentration: EEMB 142A-B-C ........................................................................

C. Aquatic Biology Emphasis: Three courses required from the following, including at least two laboratory courses (underlined): EEMB 106, 112, 116, 142AL, 142BL, 142CL, 143, 144, 144L, 147, 148, 152 (or Env S 152), 153*, 159, 163, 165, 170 .........................................................

D. Physical Environment Emphasis: One course required from the following:
EEMB 153*; Earth 164B, 168 (or Env S 168); Geog 112, 163 ..............................................

E. Electives: Additional UD courses offered in EEMB or MCDB or from Areas C and D above to bring the total UD units in the major to 48. Recommended courses: EEMB 143, 176-176L, 179 ...........................................................

Notes: Laboratory courses are underlined in areas A-E above. The following courses do not count toward upper-division major credit: EEMB 181, 182, 183, 184 (except by petition), and 189; MCDB 182, 183, 184, 194MD, 194KF 194KK. In addition, no more than 8 units of the following courses combined will apply: EEMB 184-199; MCDB 185-199. Finally, a minimum 32 units must be completed through courses within the EEMB Department.

MAJOR REGULATIONS

PREREQUISITES ..............................................................................................................
Check the General Catalog for the prerequisites to all listed courses.
P/NP GRADING OPTION .................................................................................................
Not allowed for any major course (Prep or UD major), including courses applied to the major from other departments, except up to 8 units of courses that do not allow letter grades.

SUBSTITUTIONS ..............................................................................................................
In the major requirements permissible only by petition to the department chair and dean.

RESIDENCE REQUIREMENTS .........................................................................................
At least 20 UD units in major while in residence at UCSB.

G.P.A. REQUIREMENTS .................................................................................................
At least 2.0 overall UC average in all upper-division major courses and all courses (Prep and UD) for the major, including courses in excess of minimum requirements.

DOUBLE MAJORS ...............................................................................................................
With the approval of each department chairperson, up to a total of 8 units may be applied simultaneously to both UD majors.
BIOCHEMISTRY–MOLECULAR BIOLOGY MAJOR, B.S. – 2017-2018

To be admitted to full major status, students must fulfill the pre-biology course and grade-point average requirements as described in the General Catalog and Pre-Biological Sciences Major Sheet. At minimum, they must complete twelve designated courses from the Preparation for the Major with a 2.0 or higher UC grade-point average. Grades earned must meet grade prerequisites for the full major.

PREPARATION FOR THE MAJOR

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<td>15</td>
</tr>
<tr>
<td>MCDB 1A-1AL-1B, EEMB 2-3-3L, and either MCDB 1BL or EEMB 2L</td>
<td>16</td>
</tr>
<tr>
<td>(Transfer students must consult the advisor regarding selected topics to be covered in Z courses)</td>
<td></td>
</tr>
<tr>
<td>Chemistry 6AL-6BL (or 6BH) and 109A-B-C or 109AH-BH-CH</td>
<td>18</td>
</tr>
<tr>
<td>Math 3A-B and 4A and 6A</td>
<td>16</td>
</tr>
<tr>
<td>Physics 6A-AL-BL-C-CL</td>
<td>12</td>
</tr>
</tbody>
</table>

UPPER-DIVISION MAJOR

48 UD units required, distributed as follows:

A. Genetics: MCDB 101A-B ...

B. Biochemistry: MCDB 108A (or W 108A) and 108B-C ...

C. Biochemistry Lab: MCDB 109L ...

D. Physical Chemistry: Chemistry 112A (recommended) or 113A; and MCDB 123 ...

E. Electives: courses from the following list to bring the total UD units for the major to 48 ...


No more than 8 units of the following courses combined will apply to the major: MCDB 185-199. BMSE may be accepted by petition only.

A minimum of 32 UD units must be completed through courses within the MCDB department.

Courses taken:

MAJOR REGULATIONS

PREREQUISITES: Check the General Catalog for the prerequisites to all listed courses.
P/NP GRADING OPTION: Not allowed for major courses (prep or UD), including courses applied to the major from other departments, except up to 8 units of courses that do not allow letter grades.
SUBSTITUTIONS: In the major requirements permissible only by petition to the department chair and dean.
RESIDENCE REQUIREMENTS: At least 20 UD units in major while in residence at UCSB.
G.P.A. REQUIREMENTS: At least 2.0 overall UC average in all upper-division major courses and all courses (Prep and UD) for the major, including courses in excess of minimum requirements.
DOUBLE MAJORS: With the approval of each department chairperson, up to a total of 8 units may be applied simultaneously to both UD majors.
CELL AND DEVELOPMENTAL BIOLOGY MAJOR, B.S. – 2017-2018

To be admitted to full major status, students must fulfill the pre-biology course and grade-point average requirements as described in the General Catalog and Pre-Biological Sciences Major Sheet. At the minimum, they must complete twelve designated courses from the Preparation for the Major with a 2.0 or higher UC grade-point average. Grades earned must meet grade prerequisites for the full major.

Note: Hyphens indicate that an entire sequence must be completed as shown to fulfill an area requirement.

PREPARATION FOR THE MAJOR

Chemistry 1A-AL-BL-BL-C-CL (or 2A-AC-BL-C-CL) .................................................. 15
MCDB 1A-1AL-1B, EEMB 2-3-3L, and either MCDB 1BL or EEMB 2L, ............ 16
(Transfer students must consult the advisor regarding selected topics to be covered in Z courses)
Chemistry 6AL-6BL (or 6BH) and 109A-B-C or 109AH-BH-CH ........................... 18
Mathematics 3A-B or 34A-B ..................................................................................... 8
One course from: PSTAT 5LS or 5A or Math 4A ................................................... 4 or 5
Physics 6A-AL-BL-C-CL ....................................................................................... 12

UPPER DIVISION MAJOR

48 UD units required, distributed as follows: .......................................................... 48
A minimum of 32 UD units must be completed through courses within the MCDB department.

NOTE: Courses with an asterisk (*) are listed in more than one area, but they may be applied to only one area.

A. Genetics: MCDB 101A-B ...................................................................................
B. Biochemistry: MCDB 108A (or W 108A) and 108B-C ........................................
C. Cell Biology: MCDB 103 ....................................................................................
D. Developmental Biology: Select two courses from: MCDB 112, 118, 153 ...........
E1. One course from MCDB 103L*, 112L* .................................................................
F. Electives: Additional UD courses in MCDB, EEMB, or Chemistry 141, 161 to bring unit total to 48 .................................................................

Note: The following courses do not count toward upper-division major credit:
EEMB 181, 182, 183, 184, 189; MCDB 121, 182, 183, 184, 194KF, 194KK, 194MD

In addition, no more than 8 units of the following courses combined will apply to the major:
EEMB 185-199; MCDB 185-199. BMSE may be accepted by petition only.

MAJOR REGULATIONS

PREREQUISITES ........................................... Check the General Catalog for the prerequisites to all listed courses.
P/NP GRADING OPTION ....................... Not allowed for any major course (Prep or UD major), including courses applied to the major from other departments, except up to 8 units of courses that do not allow letter grades.
SUBSTITUTIONS ........................................ In the major requirements permissible only by petition to the department chair and dean.
RESIDENCE REQUIREMENTS ............... At least 20 UD units in major while in residence at UCSB.
G.P.A. REQUIREMENTS ....................... At least 2.0 overall UC average in all upper-division major courses and all courses (Prep and UD) for the major, including courses in excess of minimum requirements.
DOUBLE MAJORS ..................................... With the approval of each department chairperson, up to a total of 8 units may be applied simultaneously to both UD majors.
ECOLOGY & EVOLUTION MAJOR, B.S. – 2017-2018

To be admitted to full major status, students must fulfill the pre-biology course and grade point average requirements as described in the General Catalog. At minimum, they must complete twelve designated courses from the Preparation for the Major with a 2.0 or higher UC grade point average. Note: Hyphens indicate that an entire sequence must be completed as shown to fulfill all area requirement. A single course can satisfy only one requirement. Grades earned must meet the grade prerequisites for the full major.

PREPARATION FOR THE MAJOR

Chemistry 1A-AL-B-BL-C-CL or 2A-AC-B-BC-C-CC .................................................. 13
MCDB 1A-AL-1B, EEMB 2-3-3L, and either MCDB 1BL or EEMB 2L ........................................... 16
(Transfer students must consult the advisor regarding selected topics to be covered in Z courses)
Mathematics 3A-B or 34A-B ......................................................................................... 8
One of the following: PSTAT 5LS or PSTAT 5A (Math 4A acceptable, but not recommended) .......... 4 or 5
Physics 6A-AL-B-BC-C-CL .................................................................................. 12

*Organic chemistry may be required by some graduate or professional schools. Consult your advisor.

UPPER-DIVISION MAJOR

48 UD units are required in biological sciences, distributed as follows: .............................................. 48

Courses with an asterisk (*) are listed in more than one area, but they may be applied to only one area

A. Core Curriculum: One course required from each of the following categories:
   1. Ecology: EEMB 120 .................................................................................
   2. Evolution: EEMB 131 (or Earth 121) ....................................................
   3. Genetics: EEMB 129 or MCDB 101A ....................................................
   4. Biometry: EEMB 146 ...........................................................................

B. Area of concentration: Three courses required from the following, including at least one from B1 and B2:
   1. Ecology: EEMB 119* (or Env S 119*), 128 (or Env S 128), 140*, 142A, 143, 147, 148, 152 (or Env S 152), 153, 159, 168, 171 (or Env S 171) ..................................
   2. Evolution: EEMB 101, 102, 108*, 136* (or Earth 111*), 138, 180* ..............

C. Quantitative Biology Emphasis: One course (or course sequence) required from the following:
   EEMB 176-176L, 179, 180* ........................................................................

D. Biodiversity and Systematics Emphasis: Three courses (or course sequences) required from the following, including at least two laboratory courses (underlined):

E. Electives: Additional UD courses offered in EEMB, or from Areas B-D above, or from any of the following to bring the total UD units in the major to 48: Anth 121; Earth 144; Geog 167; MCDB 101AH, 101B, 131, 132
   Recommended courses EEMB 142AL ...............................................................

Notes: Laboratory courses are underlined in areas A-E above. The following courses do not count toward upper-division major credit: EEMB 181, 182, 183, 184 (except by petition), and 189. In addition, no more than 8 units of the following courses combined will apply: EEMB 184-199. Finally, a minimum of 32 units must be completed through courses within the EEMB Department.

MAJOR REGULATIONS

PREREQUISITES ...................................................................................... Check the General Catalog for the prerequisites to all listed courses.
P/NP GRADING OPTION ........................................................................ Not allowed for major courses (Prep or UD), including courses applied to the major from other departments except up to 8 units of courses that do not allow letter grades.
SUBSTITUTIONS ..................................................................................... In the major requirements permissible only by petition to the department chair and dean.
RESIDENCE REQUIREMENTS .............................................................. At least 20 UD units in major while in residence at UCSB.
G.P.A REQUIREMENTS ........................................................................ At least 2.0 overall UC average in all upper-division major courses and all courses (Prep and UD) for the major, including courses in excess of minimum requirements.
DOUBLE MAJORS .................................................................................. With the approval of each department chairperson, up to a total of 8 units may be applied simultaneously to both UD majors.
MICROBIOLOGY MAJOR, B.S. – 2017-2018

To be admitted to full major status, students must fulfill the pre-biology course and grade-point average requirements as described in the General Catalog and Pre-Biological Sciences Major Sheet. At minimum, they must complete twelve designated courses from the Preparation for the Major with a 2.0 or higher UC grade-point average. Grades earned must meet grade prerequisites for the full major.

Note: Hyphens indicate an entire sequence must be completed to fulfill an area requirement.

PREPARATION FOR THE MAJOR

Chemistry 1A-AL-B-BL-C-CL (or 2A-AC-B-BC-C-CC) ......................................................... 15
MCDB 1A-AL-1B, EEMB 2-3-3L, and either MCDB 1BL or EEMB 2L ............................ 16
(Transfer students must consult the advisor regarding selected topics to be covered in Z courses)
Chemistry 6AL-6BL (or 6BH) and 109A-B-C or 109AH-BH-CH ................................................ 18
Mathematics 3A-B or 34A-B ........................................................................................................ 8
One of the following: PSTAT 5LS or 5A or Math 4A ............................................................... 4 or 5
Physics 6A-AL-B-BL-C-CL ........................................................................................................ 12

UPPER-DIVISION MAJOR

48 UD units required, distributed as follows: ........................................................................ 48

I. Core Courses:
   A. Genetics: MCDB 101A-B .................................................................................................
   B. General Microbiology: MCDB 131-131L .................................................................
   C. Bacterial Pathogenesis: MCDB 132-132L .................................................................
   D. Biochemistry: MCDB 108A (or W 108A) and 108B-C ..............................................
   E. Virology: MCDB 134 .....................................................................................................
   F. Immunobiology and Medical Immunology:
      MCDB 133 (133L strongly recommended) or 138 (or W 138) ......................................

II. Additional units from the following to bring the total in the UD major to 48: MCDB 101AH, 101L, 108AH, 108AL, 111, 111H, 133H, 133L, 134H, 135, 135H, 140L, 194BG, 197, 199 (a maximum of 4 units of MCDB 194BG, 197 and 199 combined can be applied); EEMB 111, 111H, 134, 144 .................................................................

MAJOR REGULATIONS

PREREQUISITES ........................................................................................................... Check the General Catalog for the prerequisites to all listed courses.
P/NP GRADING OPTION ................................................................................................. Not allowed for major courses (prep or UD), including courses applied to the major from other departments, except up to 8 units of courses that do not allow letter grades.
SUBSTITUTIONS .......................................................................................................... In the major requirements permissible only by petition to the department chair and dean.
RESIDENCE REQUIREMENTS ...................................................................................... At least 20 UD units in major while in residence at UCSB.
G.P.A REQUIREMENTS ................................................................................................ For the major, including courses in excess of minimum requirements.
DOUBLE MAJORS ........................................................................................................ With the approval of each department chairperson, up to a total of 8 units may be applied simultaneously to both UD majors.
PHARMACOLOGY MAJOR, B.S. – 2017-2018

To be admitted to full major status, students must fulfill the pre-biology course and grade-point average requirements as described in the General Catalog and Pre-Biological Sciences Major Sheet. At a minimum, they must complete twelve designated courses from the Preparation for the Major with a 2.0 or higher UC grade-point average. Grades earned must meet grade prerequisites for the full major.

Note: Hyphens indicate that an entire sequence must be completed as shown to fulfill an area requirement.

PREPARATION FOR THE MAJOR

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<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 1A-AL-BL-C-CL (or 2A-AC-B-BC-C-CC)</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>MCDB 1A-1AL-1B, EEMB 2-3-3L, and either MCDB 1BL or EEMB 2L</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>(Transfer students must consult the advisor regarding selected topics to be covered in Z courses)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemistry 6AL-6BL (or 6BH) and 109A-B-C or 109AH-BH-CH</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Mathematics 3A-B or 3A-A-B</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>One of the following: PSTAT 5LS or 5A or Math 4A or Psychology 5</td>
<td>4 or 5</td>
<td></td>
</tr>
<tr>
<td>Physics 6A-AL-BL-C-CL</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

UPPER-DIVISION MAJOR

48 UD units required, distributed as follows: 48

I. A. Pharmacology: MCDB 126A-AL-BL-C-
B. Biochemistry: MCDB 108A (or W 108A) and 108B
C. Genetics: MCDB 101A-B

II. Additional units from the following to bring the total upper-division units in the major to 48

Note: A minimum of 32 UD units must be completed through courses within the MCDB department.

Instructor approval required prior to enrollment in psychology courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
</table>

A maximum of 4 units of MCDB 185-199 can be applied. BMSE may be accepted by petition only. It is highly recommended that students take MCDB 111 (Physiology) and Writing 109ST (Writing for Science and Technology) prior to enrolling in the MCDB 126AL and BL courses. Students are encouraged to select their elective courses from within one of these tracks:


3. Neurobiology and Behavior: MCDB 151, 152, 153; Psychology 115, 133, 137

4. Physiology and Development: MCDB 111, 112, 112L, 151, 152, 153; EEMB 111, 154, 156

MAJOR REGULATIONS

PREREQUISITES: Check the General Catalog for the prerequisites to all listed courses.
P/NP GRADING OPTION: Not allowed for major courses (prep or UD), including courses applied to the major from other departments, except up to 4 units of courses that do not allow letter grades.
SUBSTITUTIONS: In the major requirements permissible only by petition to the department chair and dean.
RESIDENCE REQUIREMENTS: At least 20 UD units in major while in residence at UCSB.
G.P.A REQUIREMENTS: At least 2.0 overall UC average in all upper-division major courses and all courses (Prep and UD) for the major, including courses in excess of minimum requirements.
DOUBLE MAJORS: With the approval of each department chairperson, up to a total of 8 units may be applied simultaneously to both UD majors.
PHYSIOLOGY MAJOR, B.S – 2017-2018

To be admitted to full major status, students must fulfill the pre-biology course and grade-point average requirements as described in the General Catalog. At minimum, they must complete twelve designated courses from the Preparation for the Major with a 2.0 or higher UC grade-point average. Note: Hyphens indicate that an entire sequence must be completed as shown to fulfill an area requirement. A single course can satisfy only one requirement. Grades earned must meet the grade prerequisites for the full major.

PREPARATION FOR THE MAJOR

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 1A-AL-B-BL-C-CC or 2A-AC-B-BC-C-CC</td>
<td>15</td>
</tr>
<tr>
<td>MCDB 1A-1AL-1B, EEMB 2-3-3L, and either MCDB 1BL or EEMB 2L</td>
<td>16</td>
</tr>
<tr>
<td>(Transfer students must consult the advisor regarding selected topics to be covered in Z courses)</td>
<td></td>
</tr>
<tr>
<td>Chemistry 6AL-6BL (or 6BH) and 109A-B-C or 109AH-BH-CH</td>
<td>18</td>
</tr>
<tr>
<td>Mathematics 3A-B or 34A-B</td>
<td>8</td>
</tr>
<tr>
<td>One of the following: PSTAT 5LS or PSTAT 5A (Math 4A acceptable, but not recommended)</td>
<td>4 or 5</td>
</tr>
<tr>
<td>Physics 6A-AL-B-BL-C-CL</td>
<td>12</td>
</tr>
</tbody>
</table>

UPPER-DIVISION MAJOR

48 UD units are required in biological sciences, distributed as follows:

Courses with an asterisk (*) are listed in more than one area, but they may be applied to only one area.

A. Core Curriculum: One course required from each of the following categories:
   1. Ecology: EEMB 120
   2. Evolution: EEMB 131 or Earth 121
   3. Genetics: EEMB 129
   4. Biometry: EEMB 146

B. Area of Concentration: EEMB 143 or 154 (but not both) and 156 and 157

C. Cellular Biology and Biochemistry Emphasis: One course (or course sequence) required: one from C1 and one from C2.
   1. Cell Biology: MCDB 103
   2. Biochemistry: MCDB 108A-B or Chem 142A-B

D. Biodiversity and Systematics Emphasis: Two courses required from the following, including at least two laboratory courses (underlined): EEMB 106, 107-107L, 108, 111, 112, 113-113L, 116, 119, 127-127L, 136-136L (or Earth 111-111L), 144-144L

E. Electives: Additional UD courses offered in EEMB or MCDB or from Areas B, C or D above to bring the total UD units in the major to 48. Recommended courses: EEMB 163, 165; MCDB 111, 151

Notes: Laboratory courses are underlined in areas A-E above. The following courses do not count toward upper division major credit: EEMB 181, 182, 183, 184 (except by petition) and 189; MCDB 182, 183, 184, 194MD, 194KF, 194KK. In addition, no more than 8 units of the following courses combined will apply: EEMB 184-199; MCDB 185-199. Finally, a minimum of 32 units must be completed through courses within the EEMB Department.

MAJOR REGULATIONS

PREREQUISITES: Check the General Catalog for the prerequisites to all listed courses.

P/NP GRADING OPTION: Not allowed for major courses (prep or UD), including courses applied to the major from other departments, except up to 8 units of courses that do not allow letter grades.

SUBSTITUTIONS: In the major, requirements permissible only by petition to the department chair and dean.

RESIDENCE REQUIREMENTS: At least 20 UD units in major while in residence at UCSB.

G.P.A. REQUIREMENTS: At least 2.0 overall UC average in all upper-division major courses and all courses (Prep and UD) for the major, including courses in excess of minimum requirements.

DOUBLE MAJORS: With the approval of each department chairperson, up to a total of 8 units may be applied simultaneously to both UD majors.
ZOOLOGY MAJOR, B.S. – 2017-2018

To be admitted to full major status, students must fulfill the pre-biology course and grade-point average requirements as described in the General Catalog. At minimum, they must complete twelve designated courses from the Preparation for the Major with a 2.0 or higher UC grade-point average. Note: Hyphens indicate that an entire sequence must be completed as shown to fulfill an area requirement. A single course can satisfy only one requirement. Grades earned must meet the grade prerequisites for the full major.

PREPARATION FOR THE MAJOR

<table>
<thead>
<tr>
<th>COURSE</th>
<th>UNITS YET TO COMPLETE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 1A-AL-BL-C-CL or 2A-AC-BB-BC-CC</td>
<td>15</td>
</tr>
<tr>
<td>MCDB 1A-AL-1B, EEMB 2-3-3L, and either MCDB</td>
<td>16</td>
</tr>
<tr>
<td>1BL or EEMB 2L</td>
<td></td>
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<td>(Transfer students must consult the advisor</td>
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<tr>
<td>regarding selected topics to be covered in</td>
<td></td>
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<tr>
<td>Z courses)</td>
<td></td>
</tr>
<tr>
<td>Mathematics 3A-B or 34A-B</td>
<td>8</td>
</tr>
<tr>
<td>One of the following: PSTAT 5LS or PSTAT 5A</td>
<td>4 or 5</td>
</tr>
<tr>
<td>(Math 4A acceptable, but not recommended)</td>
<td></td>
</tr>
<tr>
<td>Physics 6A-AL-BL-BC-CC</td>
<td>12</td>
</tr>
</tbody>
</table>

*Organic Chemistry may be required by some graduate or professional schools. Consult with an advisor.

UPPER-DIVISION MAJOR

48 UD units are required in biological sciences, distributed as follows: 48

Courses with an asterisk (*) are listed in more than one area, but they may be applied to only one area.

A. Core Curriculum: One course required from each of the following categories:
   1. Ecology: EEMB 120
   2. Evolution: EEMB 131 (or Earth 121)
   3. Genetics: EEMB 129 or MCDB 101A
   4. Biometry: EEMB 146

B. Area of Concentration: EEMB 112 and 113-113L and 116

C. Regulatory Biology/Behavior Emphasis: Two courses required from the following:
   EEMB 138, 143, 154, 156, 157, 165

D. Biodiversity and Systematics Emphasis: One course (or course sequence) required from the following:
   EEMB 106, 107-107L, 108, 111, 119, 127, 133, 136 (or Earth 111), 140, 144, 163

E. Electives: Additional UD courses offered in EEMB, or from Areas C and D above, or from any of the following to bring the total UD units in the major to 48: Anth 121, 121T, 153T; Earth 144, 149, 111 (Geog 149); Ling 185; MCDB 101AH, 101B, 101L, 103, 111, 111H, 112, 112H, 112L, 133, 134, 151, 151H
   Recommended courses: EEMB 102

Notes: Laboratory courses are underlined in areas A-E above. The following courses do not count toward upper-division major credit: EEMB 181, 182, 183, 184 (except by petition), and 189. In addition, no more than 8 units of the following courses combined will apply: EEMB 184-199. Finally, a minimum of 32 units must be completed through courses within the EEMB Department.

MAJOR REGULATIONS

PREREQUISITES: Check the General Catalog for the prerequisites to all listed courses.

P/NP GRADING OPTION: Not allowed for major courses (prep or UD), including courses applied to the major from other departments, except up to 8 units of courses that do not allow letter grades.

SUBSTITUTIONS: In the major requirements permissible only by petition to the department chair and dean.

RESIDENCE REQUIREMENTS: At least 20 UD units in major while in residence at UCSB.

G.P.A. REQUIREMENTS: At least 2.0 overall UC average in all upper-division major courses and all courses (Prep and UD) for the major, including courses in excess of minimum requirements.

DOUBLE MAJORS: With the approval of each department chairperson, up to a total of 8 units may be applied simultaneously to both UD majors.