

**EXECUTIVE COMMITTEE  
COLLEGE OF NATURAL AND AGRICULTURAL SCIENCE**

**REPORT TO RIVERSIDE DIVISION  
MAY 23, 2017**

**To be adopted:**

Proposed changes to the undergraduate major requirements in Cell, Molecular, and Developmental Biology.

**PRESENT:**

**Major Requirements**

Some of the following requirements for the Cell, Molecular and Developmental Biology major may also fulfill the College's breadth requirements.

Consult with an advisor for course planning.

1. Life Sciences core curriculum (72-76 units)
  - a) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
  - b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
  - c) ~~CHEM 12A, CHEM 12B, CHEM 12C~~
  - d) PHYS 002A, PHYS 002B, PHYS 02LA, PHYS 02LB, PHYS 002C, PHYS 02LC
  - e) ~~MATH 009A, MATH 009B~~
  - f) STAT 100A
  - g) BCH 100, or BCH 110A and BCH 110B

2. Upper-division requirements (48 units)
  - a) Major core (16 units) BIOL 102, BIOL 107A, CBNS 101, CBNS 108.
  - b) Major electives (~~32~~ units from the following).

**Cellular emphasis.** At least one of the following is required: BIOL 113; BIOL 114;

**PROPOSED:**

**Major Requirements**

No Change

1. Life Sciences core curriculum (72-76 units)
  - a) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C
  - b) No Change
  - c) CHEM 008A, CHEM 008B, CHEM 008C, CHEM 008LA, CHEM 008LB, CHEM 008LC, or CHEM 08HA, CHEM 08HB, CHEM 08HC, CHEM 08HLA, CHEM 08HLB, CHEM 08HLC.
  - d) PHYS 002A, PHYS 002B, PHYS 02LA, PHYS 02LB, PHYS 002C, PHYS 02LC
  - e) MATH 007A or MATH 009A, MATH 007B or MATH 009B
  - f) No Change
  - g) BCH 100, or BCH 110A and BCH 110B. Students must complete all required Core Curriculum courses with a grade of C- or better and with a cumulative GPA in the courses of at least 2.0. Grades of D or F in two required courses, either separate courses or repetitions of the same course, are grounds for discontinuation from the major.

2. Upper-division requirements (48 units)
  - a) No Change
  - b) Major electives (24 units from the following).

**No change**

BIOL 121/MCBL 121, BIOL 128/CBNS 128; BPSC 135; CBNS 116; CBNS 120/PSYC 120; CBNS 165.

**Molecular emphasis.** At least one of the following is required: BCH 180A; BCH 180B; BIOL 107B; BIOL 119; BIOL 124/MCBL 124; BIOL 155/BPSC 155; CBNS 150/ENTX 150.

**Developmental emphasis.** At least one of the following is required: BCH 183; BIOL 123/MCBL 123; BIOL 132/BPSC 132; BIOL 138/BPSC 138; BIOL 168; CBNS 121/PSYC 121; CBNS 169.

**Laboratory course:** Two courses in a biological science are required. Courses including at least 3 hours of lab per week are eligible, including combined lecture and lab classes. Eligible classes include ~~BCH 101~~; ~~BCH 102~~; BCH 153/BIOL 153/BPSC 153; BIEN 155; BIOL 118; BIOL 121L/MCBL 121L; BIOL 104/BPSC 104; BIOL 132/BPSC 132; BIOL 138/BPSC 138; BIOL 143/BPSC 143; BIOL 161A; CBNS 120L/PSYC 120L; MCBL 125; and others. Students in the Health Science Track may substitute one laboratory course with a course in ethics.

**Note** A maximum of 8 units of 190-199 courses, including no more than 4 units of 198 courses, may be counted towards ~~this~~ requirement.

No change

No change

**Laboratory course:** Two courses in a biological science are required. Courses including at least 3 hours of lab per week are eligible, including combined lecture and lab classes. Eligible classes include BCH 153/BIOL 153/BPSC 153; BIEN 155; BIOL 118; BIOL 121L/MCBL 121L; BIOL 104/BPSC 104; BIOL 132/BPSC 132; BIOL 138/BPSC 138; BIOL 143/BPSC 143; BIOL 161A; CBNS 120L/PSYC 120L; MCBL 125; and others. Students in the Health Science Track may substitute one laboratory course with a course in ethics.

**Note** A maximum of 8 units of 190-199 courses, including no more than 4 units of 198 courses, may be counted towards the major elective requirement. Three units of BCH 197, BIOL 197, BPSC 197, CBNS 197, ENTM 197, PLPA 197, MCBL 197, NEM 197, BCH 199, BIOL 199, BPSC 199, CBNS 199, ENTM 199, PLPA 199, MCBL 199, or NEM 199 may substitute for one of the required laboratory courses.

3. *Depth requirement (16 units).* For B.A. students, this requirement can be fulfilled with additional courses in Humanities and Social Sciences, and Foreign Languages. For the B.S. degree, students are required to take an additional 16 units of course work in natural sciences (including a biological or chemical science) or mathematics. Additional major elective units beyond the 32 required in 2b may be applied to this requirement.

4. *Health Science track.* Students wishing to apply to medical, dental or veterinary professional schools must follow the requirements listed above, but are encouraged to select from the following courses. For B.A. students, some of these will fulfill their Humanities and Social Sciences and Foreign Languages requirements.

3. No Change

4. No Change

Please consult the faculty adviser.

- i. Foreign language: three courses are recommended. i. No change
- ii. Community service: a maximum of 4 units may be counted towards the 180 unit graduation requirement, using CBNS 198-I or equivalent. ii. No Change
- iii. Ethics: A course is strongly recommended, such as PHIL 009 or PHIL 167. iii. No Change
- iv. Two upper-division classes in Psychology are recommended, such as CBNS 126/PSYC 126; CBNS 127/PSYC 127; PSYC 129; PSYC 178; or PSYC 179. iv. No Change
- v. When selecting electives in the natural sciences, students are recommended to include classes in an area of microbiology (e.g. BIOL 157, BIOL 171, ENSC 133/MCBL 133/SWSC 133, ENSC 141/MCBL 141/SWSC 141, BIOL 121/MCBL 121, BIOL 123/MCBL 123/PLPA 123, BIOL 124/MCBL 124, BIOL 134/PLPA 134), and in anatomy, zoology, or physiology (BIOL 151, BIOL 161A, BIOL 175, BIOL 176). v. No Change

**Sample Program Outlines**

**1. Bachelor of Science Degree (Disciplinary track)**

The sample program for B.S. students provides a solid science background for students interested in research or teaching careers in biomedical science. Undergraduate laboratory research is strongly recommended as an important element in the program.

Freshman Year	Fall	Winter	Spring
NASC 093	2		
ENGL 001A, 001B	4		4

**Sample Program Outlines**

**1. Bachelor of Science Degree (Disciplinary track)**

The sample program for B.S. students provides a solid science background for students interested in research or teaching careers in biomedical science. Undergraduate laboratory research is strongly recommended as an important element in the program.

Freshman Year	Fall	Winter	Spring
NASC 093	2		
ENGL 001A, 001B	4		4

CHEM 001A, 001B, 001C, 01LA, 01B, 01C	5	5	5
BIOL 005A, 05LA, 005B		5	4
<u>MATH 009A,</u> <u>009B</u>	4	4	
Total Units	15	14	13

CHEM 001A, 001B, 001C, 01LA, 01B, 01C	5	5	5
BIOL 005A, 05LA or <u>020</u> , 005B		5	4
<u>MATH 007A</u> <u>or MATH</u> <u>009A, MATH</u> <u>007B or</u> <u>MATH 009B</u>	4	4	
Total Units	15	14	13

<b>Sophomore Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PHYS 002A, 002B, 002C, 02LA, 02LB, 02LC	5	5	5
BIOL 005C, 102	4		4
<u>CHEM 12A,</u> <u>12B, 12C</u>	4	4	4
Human/Soc. Sci Elect.	2	8	4
Total Units	15	17	17

<b>Sophomore Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PHYS 002A, 002B, 002C, 02LA, 02LB, 02LC	5	5	5
<u>BIOL 005C,</u> <u>102</u>	4		4
<u>CHEM 008A,</u> <u>008B, 008C,</u> <u>008LA, 008LB,</u> <u>008LC</u>	4	4	4
Human/Soc. Sci Elect.	2	8	4
Total Units	15	17	17

CBNS 101			4
STAT 100A	5		
BCH 100	4		
Major Elect. & Depth reqs (e.g. BIOL 121/MCBL 121, 121L; BIOL 107B, BIOL 128/CBNS 128)	8	8	8
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Human/Soc. Sci Elect.		4	4
Total Units	<u>17</u>	16	16

CBNS 101			4
STAT 100A	5		
BCH 100	4		
Major Elect. & Depth reqs (e.g. BIOL 121/MCBL 121, 121L; BIOL 107B, BIOL 128/CBNS 128)	<u>4</u>	8	8
Human/Soc. Sci Elect.		4	4
Total Units	<u>13</u>	16	16

Senior Year	Fall	Winter	Spring
ENGL 001C			4
CBNS 108			4
Major Elect. & Depth reqs (e.g. BIOL 113, 168; BIOL 132/BPSC 132; BPSC 135; CBNS 120/PSYC 120; CBNS 169)	8	8	4
Human/Soc. Sci Elect.	4	4	

Senior Year	Fall	Winter	Spring
ENGL 001C			4
CBNS 108			4
Major Elect. & Depth reqs (e.g. BIOL 113, 168; BIOL 132/BPSC 132; BPSC 135; CBNS 120/PSYC 120; CBNS 169)	8	8	4
Human/Soc. Sci Elect.	4	4	

XXX 190, 197, 198, 199	2	3	3
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Total Units	14	15	15
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XXX 190, 197, 198, 199	2	3	3
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Total Units	14	15	15
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**2. Bachelor of Science Degree (Health Science track)**

The sample program for B.S. students with a professional emphasis provides a very strong science background, with recommended elective course choices emphasizing biomedical pertinence. Additionally, a foreign language is recommended, as well as Community Service (for course credit). Further breadth may be developed by electing Humanities and Social Science course options within the major depth requirement.

Freshman Year	Fall	Winter	Spring
NASC 093	2		
ENGL 001A, 001B	4		4
CHEM 001A, 001B, 001C, 01LA, 01B, 01C	5	5	5
BIOL 005A, 05LA, 005B		5	4
MATH 009A, 009B	4	4	

**2. Bachelor of Science Degree (Health Science track)**

The sample program for B.S. students with a professional emphasis provides a very strong science background, with recommended elective course choices emphasizing biomedical pertinence. Additionally, a foreign language is recommended, as well as Community Service (for course credit). Further breadth may be developed by electing Humanities and Social Science course options within the major depth requirement.

Freshman Year	Fall	Winter	Spring
NASC 093	2		
ENGL 001A, 001B	4		4
CHEM 001A, 001B, 001C, 01LA, 01B, 01C	5	5	5
BIOL 005A, 05LA or <u>020</u> , 005B		5	4
<u>MATH 007A</u> or <u>MATH</u> <u>009A</u> , <u>MATH</u> <u>007B</u> or <u>MATH 009B</u>	4	4	

Total Units	15	14	13
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Total Units	15	14	13
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Sophomore Year	Fall	Winter	Spring
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PHYS 002A, 002B, 002C, 02LA, 02LB, 02LC	5	5	5
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BIOL 005C, 102	4		4
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<del>CHEM 12A, 12B, 12C</del>	4	4	4
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Human/Soc. Sci Elect.	2	8	4
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Total Units	15	<del>17</del>	17
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Sophomore Year	Fall	Winter	Spring
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PHYS 002A, 002B, 002C, 02LA, 02LB, 02LC	5	5	5
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BIOL 005C, 102	4		4
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<u>CHEM 008A, 008B, 008C, 008LA, 008LB, 008LC</u>	4	4	4
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Human/Soc. Sci Elect.	2	<u>4</u>	4
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Total Units	15	<u>13</u>	17
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Junior Year	Fall	Winter	Spring
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BIOL 107A		4	
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CBNS 101			4
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BCH 100	4		
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Junior Year	Fall	Winter	Spring
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BIOL 107A		4	
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CBNS 101			4
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BCH 100	4		
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Major Elect. & Depth reqs (e.g. BIOL 121/MCBL 121, 121L; BIOL 107B, BIOL 128/CBNS 128)	8	8	8
Foreign Language	4	4	4
Total Units	16	16	16

Major Elect. & Depth reqs (e.g. BIOL 121/MCBL 121, 121L; BIOL 107B, BIOL 128/CBNS 128)	8	<u>4</u>	8
<u>Human/Soc. Sci Elect.</u>		<u>4</u>	
Foreign Language	4	4	4
Total Units	16	16	16

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Senior Year	Fall	Winter	Spring
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ENGL 001C		4	
CBNS 108			4
STAT 100A	5		
Major Elect. & Depth reqs (e.g. BIOL 113, 168; BIOL 132/BPSC 132; BPSC 135; CBNS 120/PSYC 120; CBNS 169)	8	8	4
Human/Soc. Sci Elect.			4

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Senior Year	Fall	Winter	Spring
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ENGL 001C		4	
CBNS 108			4
STAT 100A	5		
Major Elect. & Depth reqs (e.g. BIOL 113, 168; BIOL 132/BPSC 132; BPSC 135; CBNS 120/PSYC 120; CBNS 169)	8	8	4
Human/Soc. Sci Elect.			4



XXX 190, 197, 198, 199	2	3	3
Total Units	15	15	15

XXX 190, 197, 198, 199	2	3	3
Total Units	15	15	15

**3. Bachelor of Arts Degree (Disciplinary or Health Science tracks)**

The sample program for B.A. students provides a broad-based education that builds on the strong foundation in science, with emphasis in humanities, social sciences, and foreign language.

Freshman Year	Fall	Winter	Spring
NASC 093	2		
ENGL 001A, 001B	4		4
CHEM 001A, 001B, 001C, 01LA, 01B, 01C	5	5	5
BIOL 005A, 05LA , 005B		5	4
MATH 009A, 009B	4	4	
Total Units	15	14	13

**Sophomore Year**

**3. Bachelor of Arts Degree (Disciplinary or Health Science tracks)**

The sample program for B.A. students provides a broad-based education that builds on the strong foundation in science, with emphasis in humanities, social sciences, and foreign language.

Freshman Year	Fall	Winter	Spring
NASC 093	2		
ENGL 001A, 001B	4		4
CHEM 001A, 001B, 001C, 01LA, 01B, 01C	5	5	5
BIOL 005A, 05LA <u>or</u> BIOL 020, 005B		5	4
<u>MATH 007A</u> <u>or MATH</u> <u>009A, MATH</u> <u>007B or</u> <u>MATH 009B</u>	4	4	
Total Units	15	14	13

**Sophomore Year**

ENGL 001C		4		
PHYS 002A, 002B, 002C, 02LA, 02LB, 02LC	5	5	5	
BIOL 005C, 102	4		4	
<u>CHEM 12A, 12B, 12C</u>	4	4	4	
Foreign Language			4	
Human/Soc. Sci Elect.	4			
Total Units	17	13	17	

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Junior Year	Fall	Winter	Spring
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BIOL 107A		4	
CBNS 101			4
BCH 100	4		

ENGL 001C		4		
PHYS 002A, 002B, 002C, 02LA, 02LB, 02LC	5	5	5	
BIOL 005C, 102	4		4	
<u>CHEM 008A, 008B, 008C, 008LA, 008LB, 008LC</u>	4	4	4	
Foreign Language				4
Human/Soc. Sci Elect.	4			
Total Units	17	13	17	

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Junior Year	Fall	Winter	Spring
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BIOL 107A		4	
CBNS 101			4
BCH 100	4		

Major Elect. & Depth reqs (e.g. BIOL 121/MCBL 121, 121L; BIOL 107B, BIOL 128/CBNS 128)	4	4	4
Human/Soc. Sci Elect. (e.g. PSYC 002, 178, 179, PHIL 167)	4	4	8
Foreign Language	4	4	
Total Units	16	16	16

Major Elect. & Depth reqs (e.g. BIOL 121/MCBL 121, 121L; BIOL 107B, BIOL 128/CBNS 128)	4	4	4
Human/Soc. Sci Elect. (e.g. PSYC 002, 178, 179, PHIL 167)	4	4	8
Foreign Language	4	4	
Total Units	16	16	16

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Senior Year	Fall	Winter	Spring
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CBNS 108			4
Major Elect. & Depth reqs (e.g. BIOL 113, 168; BIOL 132/BPSC 132; BPSC 135; CBNS 120/PSYC 120; CBNS 169)	8	4	4
STAT 100A		5	
Human/Soc. Sci Elect.		4	8

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Senior Year	Fall	Winter	Spring
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CBNS 108			4
Major Elect. & Depth reqs (e.g. BIOL 113, 168; BIOL 132/BPSC 132; BPSC 135; CBNS 120/PSYC 120; CBNS 169)	8	4	4
STAT 100A		5	
Human/Soc. Sci Elect.	4	4	8

XXX 190, 197, 2 3  
198, 199

XXX 190, 197, 2 2  
198, 199

Total Units 10 16 16

Total Units 14 15 16

**Justification:**

1. The changes requested reduce the required upper-division classes required by 8 units, by reducing the units required for major elective from 32 to 24. The required core classes (both the general life science core and the 16 major core units) remain unchanged. This was implemented as part of the system-wide request to evaluate majors. Our faculty decided that 6 classes beyond the core was sufficient and more in line with similar majors at other campuses. Small changes corresponding to this reduction were incorporated into the sample programs. Approved by CMDB faculty 6/12/2016.
2. From the Exec Committee: A motion to approve unanimously with the revision to add a math statement that includes MATH07A or MATH 9A, MATH 7B or MATH 9B instead of just MATH 9A, MATH 9B.
3. Students are now required to obtain a C-minus or better in the life sciences core curriculum, with a cumulative GPA in those courses of 2.0. This will encourage students to do better in the classes or help them select majors more appropriate to their needs at an earlier stage of their academic career. This also brings the major in line with most of the other life science majors. Approved by CMDB faculty 6/9/2015.
4. The Chemistry department has renumbered organic chemistry, and the curriculum requirements and sample programs have been changed accordingly. Approved by CMDB faculty 11/15/2016.
5. The justification a maximum of 8 units of 190-199 courses is the faculty wish to encourage undergraduate research, and feel that the educational and professional development value to students of an independent research class may equal or exceed the value of a traditional laboratory course. Note that the majors will still need to take two traditional lab courses in the life sciences.

**Approvals:**

Approved by the faculty of the Department of Cell, Molecular, and Developmental Biology:  
Approved by the Executive Committee College of Natural and Agricultural Sciences:  
Approved by the Committee on Educational Policy:

November 15, 2015  
December 16, 2016  
May 10, 2017