

# BIOMEDICAL ENGINEERING, B.S.

## FOUR-YEAR PLAN

### SAMPLE FOUR-YEAR PLAN

#### First Year

Fall	Credits	Spring	Credits
MATH 221		5 MATH 222	4
CHEM 109 (or CHEM 103 & CHEM 104) <sup>1</sup>		5 E M A 201, PHYSICS 201, or PHYSICS 207 <sup>2</sup>	3
Communications A		3 CHEM 343	3
INTEREGR 170 <sup>3</sup>		3 INTEREGR 170 <sup>3</sup>	3
or Liberal Studies Elective <sup>Med</sup>		or Liberal Studies Elective <sup>Med</sup>	
		COMP SCI 200, 220, or 300 <sup>4</sup>	3
	<b>16</b>		<b>16</b>

#### Second Year

Fall	Credits	Spring	Credits
B M E 200 <sup>5</sup>		2 B M E 201	3
MATH 234		4 MATH 320 or 319	3
PHYSICS 202 or 208		5 E M A 303 or M E 306	3
B M E 325, STAT 324, or STAT 431 <sup>4</sup>		3 Free-General Elective Credits <sup>Med</sup>	2
Science Elective <sup>6, Med</sup>		3 B M E 310 <sup>7</sup>	3
		Liberal Studies Elective	3
	<b>17</b>		<b>17</b>

#### Third Year

Fall	Credits	Spring	Credits
B M E 300 <sup>6</sup>		3 Liberal Studies Elective	3
Liberal Studies Elective		3 Free-General Elective Credits	2
B M E 315 <sup>7</sup>		3 Free-Engineering Technical Elective	2
Select one of the following options:		5 Area-Engineering Technical Elective	3
ZOOLOGY/ BIOLOGY 101 & ZOOLOGY/ BIOLOGY 102		Select one of the following options:	3
ZOOLOGY/ BIOLOGY/ BOTANY 151 <sup>Med</sup>		B M E 301 <sup>9</sup>	
BIOCORE 381 & BIOCORE 382 (the first lab - 382 - is recommended not required) <sup>8, Med</sup>		ZOOLOGY/ BIOLOGY/ BOTANY 152	
Area-Required Engineering Technical Elective	3	BIOCORE 383 & BIOCORE 384	

E C E 230	B M E/PHM SCI 430 <sup>7</sup>	3
E C E 330		
E M A 202 or M E 240		
B M E 330 or CBE 320		

17

16

#### Fourth Year

Fall	Credits	Spring	Credits
B M E 400		3 B M E 402 <sup>5</sup>	3
Select one of the following options: <sup>Med</sup>		5 Liberal Studies Elective <sup>Med</sup>	3
ANAT&PHY 335		Advanced Zoology Elective, select one of the following:	3
BIOCORE 485 & BIOCORE 486		ANAT&PHY 337	
Area-Engineering Technical Elective	3	GENETICS 466	
Area-Engineering Technical Elective	3	ZOOLOGY 470	
		ZOOLOGY/ PSYCH 523	
		ZOOLOGY 570	
		BIOCORE 587	
		Advanced Biomedical Engineering Technical Elective	3
		Area-Engineering Technical Elective	3
	<b>14</b>		<b>15</b>

**Total Credits 128**

### FOOTNOTES

#### Med

–These courses are identified as requirements for most medical schools and are included within the 128 degree credits. Students not wishing to attend medical school may choose any of the listed options. Choosing other options will affect the total number of credits. Medical schools have varying requirements. Liberal electives, free-general electives, and zoology electives can often be used to satisfy these. **Check requirements early.** For example, to prepare for the MCAT it is recommended that students take psychology and sociology. In addition, some schools require an intermediate humanities or social science with an intensive writing component (Comm B) or credits in the English department. All these can be fulfilled within the liberal studies requirements and thus early planning starting freshman year is important. A good resource is: <http://prehealth.wisc.edu/>.

1

CHEM 103 General Chemistry I & CHEM 104 General Chemistry II may be substituted for CHEM 109 Advanced General Chemistry. For this choice, the excess 4 credits are counted as free-general electives. Most medical schools require one year of basic chemistry. UW–Madison's medical school (and others) accepts CHEM 109 as a full-year equivalent.

**2**

It is highly recommended that students take E M A 201 Statics instead of PHYSICS 201 General Physics. If PHYSICS 201 is chosen instead of E M A 201, another engineering course from a degree-granting engineering program might need to be substituted for E M A 201. The excess 5 credits from PHYSICS 201 are counted as free-general elective credits. E M A 201 Statics is a requisite for E M A 303/M E 306 Mechanics of Materials and thus taking PHYSICS 201/PHYSICS 208 General Physics is not recommended.

**3**

INTEREGR 170 Design Practicum is required only for students directly admitted to B M E as freshmen and counts toward the 48 engineering credits.

**4**

It is recommended that students take statistics and/or computer science in the freshman year for those needing additional core course options.

**5**

Students who are admitted late to the program and/or students who take part in another experience (such as co-op and/or study abroad), missing B M E 200 Biomedical Engineering Design or B M E 300 Biomedical Engineering Design and Leadership, or students who may graduate early missing B M E 402 Biomedical Engineering Capstone Design II on a rare approved exception, may substitute for up to two of these courses for the semester they are not in the program or at UW-Madison.

Approved substitutions include: B M E 1 Cooperative Education Program, engineering research credit, or any 200-level or above additional engineering technical elective lab or design experience.

For more information on the unique design sequence see: <http://bmedesign.engr.wisc.edu/about/>.

**6**

Premeds or students interested in biomaterials, cellular and tissue engineering should choose to take CHEM 345 and it is recommended to use Free-General Electives for CHEM 344.

**7**

The three core courses are all required: B M E 310 Bioinstrumentation, B M E 315 Biomechanics, B M E/PHM SCI 430 Biological Interactions with Materials, but they can be taken in any order. It is recommended that students take the one in their track of interest first, or as early as possible.

**8**

Students very serious about medical school or a career in research and learning about biology may select to apply for BIOCORE, a rigorous biology honors program:

- BIOCORE 381 Evolution, Ecology, and Genetics
- BIOCORE 382 Evolution, Ecology, and Genetics Laboratory
- BIOCORE 383 Cellular Biology
- BIOCORE 384 Cellular Biology Laboratory
- BIOCORE 485 Principles of Physiology
- BIOCORE 486 Principles of Physiology Laboratory

The BIOCORE courses have limited enrollment and students must be accepted into this program (applying as freshman). It is generally advisable to complete the entire sequence once it is started. Only BIOCORE 382 Evolution, Ecology, and Genetics Laboratory is not required and is not necessary to fulfill premed requirements; however, it is recommended as it has been helpful in understanding the BIOCORE lab process. If all the other BIOCORE courses are taken (a total of 16 cr), this will replace the ZOOLOGY/BIOLOGY 101 Animal Biology and ZOOLOGY/BIOLOGY 102 Animal Biology Laboratory, the Advanced Life Science Elective, ANAT&PHY 335 Physiology, and fulfill the Communication B requirement.

**9**

Students interested in pre-health programs should take ZOOLOGY/BIOLOGY/BOTANY 152 Introductory Biology or BIOCORE 384 Cellular Biology Laboratory to satisfy Communication Part B instead of B M E 301 Biomedical Engineering Design and Communication.