

**CONCENTRATION PLAN for the FIVE-YEAR PROGRAM in  
CELLULAR AND MOLECULAR BIOLOGY (CMB) and  
BIOMEDICAL ENGINEERING (BME)**

[Eff. 9/2007 – updated 8/09]

Name \_\_\_\_\_ Uniqname \_\_\_\_\_  
UMID \_\_\_\_\_ Exp. Date of Graduation \_\_\_\_\_

**B.S. PHASE**

**PREREQUISITES**

**NOTE:** To complete the introductory series, students must take BIO 171, 172, and 173 (Track #1); or AP BIO 195 and BIO 173 (Track #2); or already have taken BIO 162 (no longer offered) (Track #3).

	TERM AND YEAR	COMPLETED
<u>Track #1</u> – Biology 171	_____	_____
Biology 172	_____	_____
Biology 173 ( <i>lab</i> )	_____	_____
<u>Track #2</u> – Biology 195 (AP)	_____	_____
Biology 173 ( <i>lab</i> )	_____	_____
<u>Track #3</u> – Biology 162 (or AP credit for BIO 162)	_____	_____
Chemistry 210 and 211	_____	_____
Chemistry 215 and 216	_____	_____
Physics 125 and 127 ( <i>lab</i> ); <b>OR</b> 135 or 140 or 160 and 141 ( <i>lab</i> )	_____	_____
Physics 126 and 128 ( <i>lab</i> ); <b>OR</b> 235 or 240 or 260 and 241 ( <i>lab</i> )	_____	_____
Mathematics 115 or 120 or 185	_____	_____
Mathematics 116 or 121 or 186	_____	_____

**CONCENTRATION COURSES**

**CORE COURSES**

Biology 305, Genetics	_____	_____
Biology/MCDB 310 or 311, <b>OR</b> Biolchem. 415, <b>OR</b> Chem. 451 and 452 ( <i>452 counts as an elective</i> )	_____	_____
MCDB 427, Molecular Biology	_____	_____
MCDB 428, Cell Biology, <b>or</b> BiomedE 418	_____	_____
MCDB 306, Genetics Laboratory	_____	_____
MCDB 429, Lab in Cell and Molecular Biology	_____	_____

**ADVANCED CELL AND MOLECULAR BIOLOGY:** One advanced CMB course selected from Group A (see attached list). This course should be selected in consultation with and approved by the program advisors.

## BIOLOGY ELECTIVE

One course chosen from Group B (see attached) in consultation with and approved by the program advisors.

<u>COURSE NAME AND NUMBER</u>	<u>TERM and YEAR</u>	<u>COMPLETED</u>
<b>ENGINEERING COURSES</b> —Select either Series 1 or Series 2.		
<u>Series 1: Chemical Engineering</u>		
ChE 230	_____	_____
ChE 330	_____	_____
ChE 342 <u>or</u> 344	_____	_____
<u>Series 2: Biomedical Engineering</u>		
BiomedE 221	_____	_____
BiomedE 321	_____	_____
BiomedE 331	_____	_____
<b>UNDERGRADUATE ENGINEERING</b>		
Eng 101, <b>or</b> EECS 183	_____	_____
BiomedE 419*	_____	_____
* <i>This course satisfies an advanced CMB course requirement.</i>		
<b>COGNATES</b>		
Stats 400	_____	_____
Math 215	_____	_____
Math 216	_____	_____

## Group A. Advanced CMB Courses (All courses are three credits.)

One course selected in consultation with, and approved by, the program advisors. (BiomedE584 is elected in the graduate phase, and does not count toward this requirement.)

MCDB 400	Advanced Independent Research (F/W/Sp/Su)
MCDB 401	Advanced Topics (appropriate sections)
MCDB 402	Molecular Biology of Pain and Sensation
MCDB 403	Molecular and Cellular Biology of the Synapse
MCDB 404	Genetics, Development, and Evolution
MCDB 405	Molecular Basis of Development
MCDB 408	Genomic Biology (W)
MCDB 411	Protein Structure and Function (F)
MCDB 415	Microbial Genetics (W)
MCDB 417	Chromosome Structure and Function
MCDB 418	Endocrinology (F)
MCDB 419	Endocrinology Laboratory (W)
MCDB 422	Cellular and Molecular Neurobiology (F)
MCDB 423	Research in Cellular and Molecular Neurobiology (F/W)
MCDB 425	Biotechnology: From Concepts to Technologies
MCDB 426	Molecular Endocrinology (W)
MCDB 430	Plant Molecular Biology (W)
MCDB 435	Intracellular Trafficking (F)

- MCDB 436 Immunology (Sp)
- MCDB 444 Bacterial Cell Biology
- MCDB 450 Genetics and Molecular Biology of Complex Behavior
- MCDB 469 Signal Transduction (W)
- MCDB 589 Mechanisms of Microbial Evolution (W)

**Group B. Biology Elective**

Any Biology, EEB, or MCDB course at the 200, 300, or 400 level (EXCEPT Bio 200, 201, 262, 300, 302, 320, or 412). An additional Advanced CMB Course listed above can be used to meet this requirement.

**M.S. PHASE**

**ADVANCED CELL AND MOLECULAR BIOLOGY**

TERM and YEAR

COMPLETED

BiomedE 584

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**GRADUATE BIOMEDICAL ENGINEERING CORE COURSES**

BiomedE 500

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BiomedE 550

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BiomedE 590

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**GRADUATE ENGINEERING**

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**ONE ADVANCED MATHEMATICS COURSE**

Choose a total of 3 credits in consultation with the BME program advisor.

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**ONE ADVANCED STATISTICS COURSE**

Choose a total of 3 credits in consultation with the BME program advisor.

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