Chemical and Biomolecular Engineering Four Year Academic Plan

Name:_____ **UID:**_____

Year 1	Fall			Spring		
Gateway requirements include: ENGL 101, CHEM 135, MATH 141, PHYS 161 and an approved Distributive Studies course. (Directly admitted freshman must successfully complete these courses and ENES 100 by 45 UM credits.)	***Course***	***Credit***	***Grade***	***Course***	***Credit***	***Grade***
	ENES100 (SP)	3		CHBE 101	3	
	MATH 140 (AR)	4		MATH 141	4	
	CHEM 135	3		PHYS 161 (NS)	3	
	CHEM 136	1		ENGL 101 (AW)	3	
	Humanities (HU)*	3		BIOE 120	3	
	Total	**14**		**Total**	**16**	

Year 2	Fall			Spring		
	Course	***Credit***	***Grade***	***Course***	***Credit***	***Grade***
	MATH 241	4		MATH 246	3	
	CHEM 231	3		PHYS 270 and PHYS 271	3 & 1	
	CHEM 232	1		CHEM 241	3	
	PHYS 260 and PHYS 261 (NL)	3 & 1		CHEM 242	1	
	CHBE 250	3		ORAL COMM (OC)	3	
	CHBE 301	3		CHBE 302	3	
	Total	**18**		**Total**	**17**	

Year 3	Fall			Spring		
Second benchmark requirements must be completed one year after students are reviewed for the gateway requirements and include: All required 100 and 200 level MATH, PHYS and ENES courses, and CHBE 101.	***Course***	***Credit***	***Grade***	***Course***	***Credit***	***Grade***
	CHBE 410	3		BCHM 461 or 463	3	
	CHBE 422	3		ENMA 300, 425, or BIOE 453	3	
	CHBE 440	3		CHBE 424	3	
	CHEM 272	2		CHBE 426	3	
	ENGL 393 (PW)	3		CHBE 333	1	
	Scholarship in Practice (SP)*	3		Humanities (HU)*	3	
	Total	**17**		**Total**	**16**	

Year 4	Fall			Spring		
Third benchmark requirements must be completed one year after students are reviewed for the second benchmark and include: All required 200 level CHEM courses, ENGL 393, ENMA 425 OR BIOE 453, CHBE 250, CHBE 301, CHBE 302, CHBE 422, CHBE 426, CHBE 440 and CHBE 424.	***Course***	***Credit***	***Grade***	***Course***	***Credit***	***Grade***
	CHBE 437	3		CHBE 446	3	
	CHBE 442	3		Tech Elective (see advisor)	3	
	CHBE 444	3		Tech Elective (see advisor)	3	
	Tech Elective (see advisor)	3		Hist & Social Sciences (HS)*	3	
	Hist & Social Sciences (HS)*	3				
	Total	**15**		**Total**	**12**	

*All students must complete two Distributive Studies courses that are approved for I-series courses. The Understanding Plural Societies (UP) and Cultural Competence (CC) courses may also fulfill Distributive Studies categories.

CHEMICAL and BIOMOLECULAR ENGINEERING

NAME: _____ UID: _____

General Education Requirements
Fundamental Studies

Requirements	*Course*	*Credits*	*Grade*
Academic Writing (AW)	ENGL 101	3	
Professional Writing (PW)	ENGL 393	3	
Oral Communication (OC)		3	
Math (MA)	----------	0	
Analytic Reasoning (AR)	MATH 140	0	

Distributive Studies

Requirements	*Course*	*Credits*	*Grade*
Natural Science Lab (NL)	PHYS 260&261	0	
Natural Sciences (NS)	PHYS 161	0	
History/Social Sciences (HS)		3	
History/Social Sciences (HS)		3	
Humanities (HU)		3	
Humanities (HU)		3	
Scholarship in Practice (SP)	ENES100	0	
Scholarship in Practice (SP) non major		3	

I-Series
Normally double counted with Distributive Studies

Requirements	*Course*	*Credits*	*Grade*
I-Series (IS)			
I-Series (IS)			

Diversity
(overlap permitted with Distributive Studies and/or I-series)

Requirements	*Course*	*Credits*	*Grade*
Understanding Plural Societies (UP)			
Understanding Plural Societies (UP) or Cultural Competency (CC)			

Basic Sciences

Requirements- The cumulative average of these courses must be a 2.0	*Credits*	*Grade*
CHEM 135 - Chem for Eng	3	
CHEM 136 - Chemistry Lab for Eng	1	
CHEM 231 and 232 - Organic Chemistry I & Lab	3 & 1	
CHEM 241 and 242 - Organic Chemistry II & Lab	3 & 1	
PHYS 161 - General Physics I	3	
PHYS 260 and 261 - Gen Physics II & Lab	3 & 1	
PHYS 270 and 271 - Gen Physics III & Lab	3 & 1	
MATH 140 - Calculus I (AR)	4	
MATH 141 - Calculus II	4	
MATH 241 - Calculus III	4	
MATH 246 - Differential Equations	3	

Engineering Sciences

Requirements- The cumulative average of these courses must be a 2.0		*Credits*	*Grade*
ENES 100 - Intro to Eng Design		3	

Major Requirements

The cumulative average of these courses must be a 2.0

Requirements	*Credits*	*Grade*
BIOE 120 - Biology for Engineers	3	
CHBE 101 - Intro to Chem & Biom. Eng	3	
CHBE 250 - Comp MethodsChem & Bio	3	
CHBE 301 - Chem & Biomolec Thermo	3	
CHBE 302 - Chem & Biomolec Thermo II	3	
CHBE 333 - Comm Skills for Eng	1	
CHBE 410 - Statistics & Experimental Design	3	
CHBE 422 - Chem & Biomolec Trans.	3	
CHBE 424 - Chem & Biomolec Trans. II	3	
CHBE 426 - Chem & Biomolec Sep. Processes	3	
CHBE 437 - Chem & Biomolec Eng Lab	3	
CHBE 440 - Chem Kinetics & Reactor	3	
CHBE 442 - Chem Eng Systems Analysis	3	
CHBE 444 - Process Eng Econ & Design I	3	
CHBE 446 - Process Eng Econ & Design II	3	
ENMA 300 **or** ENMA425 **or** BIOE453	3	
CHBE 4XX - Elective	3	
CHBE 4XX - Elective	3	
CHBE 4XX - Elective	3	
Technical Requirements		
BCHM 461 – Biochem I or BCHM 463	3	
CHEM 272 – Gen Bioanalytical Chem Lab	2	
ENGL 393 - Technical Writing	3	

For technical elective guidelines visit:
www.chbe.umd.edu/undergrad/tech-electives.html

Gateway requirements

Requirements	*Credits*	*Grade*
ENGL 101	3	
CHEM 135, 271 or 113	3	
MATH 141	4	
PHYS 161	3	
An approved Distributive Studies course	3	
ENES 100 (required for Freshmen Direct Admits)	3	
Benchmark 2 requirements		
MATH 140, 141, 241 and 246	15	
PHYS 161, 260, 261, 270 and 271	11	
ENES 100 and CHBE 101	6	
Benchmark 3 requirements		
ENGL 393	3	
ENMA 425 OR BIOE 453	3	
CHEM 231, 232, 241, 242 and 272	10	
CHBE 250, 301, 302, 422, 424, 426 and 440	21	

Requirements for Graduation:

- ☐ At least 30 credits must be earned at UMD
- ☐ 15 of the final 30 credits must be earned at the 300-400 level
- ☐ 12 upper level major credits must be earned at UMD

Students must earn a minimum of 120 credits for the degree.

Benchmark_____ Direct Int. Ext.