000050

CLEMSON UNIVERSITY **Curriculum and Course Change System - Print Major Form**

Change Major Name: Chemical Engineering
Degree: BS
Effective Catalog Year: 2013
.. **Change Major Name to:**
.. **Change Degree to:** (CHE approval required)
.. **Change Curriculum Requirements**
(Submit or upload Curriculum map in catalog format. CHE approval required for > 18 hours of changes)
.. **Change General Education Requirements**
(Must also submit a General Education Checklist)
X **Add, Change or Delete Concentration(s)**
(Submit or upload Curriculum map in catalog format. CHE approval required)
.. **Add, Change or Delete Emphasis Area(s)**

Explanation: Currently all students in the chemical engineering major are required to take BIOCH 305. In the annual survey completed by chemical engineering seniors, up to half report that BIOCH 305 does not meet their perceived educational needs in content or format. The proposed change will broaden the options for chemical engineering students IN THE BIOMOLECULAR CONCENTRATION to fill the biochemistry requirement by selecting one course from two alternatives that have somewhat different content and approach to the subject: BIOCH 305 and Ch 360.

Form Originator: CHGDNG, Charles Gooding **Date Form Created:** 9/4/2012
Form Last Updated by: , **Date Form Last Updated:** 9/4/2012
Form Number: 5203

Approval

	9/4/12		10/5/2012
Chair, Department Curriculum Committee	Date	Chair, Undergraduate Curriculum Committee	Date
	9/4/12		
Department Chair	Date	Chair, Graduate Curriculum Committee	Date
	9/21/12		12/13/1
Chair, College Curriculum Committee	Date	Provost	Date
	9/24/12		12/14/1
College Dean	Date	President	Date

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CHEMICAL ENGINEERING CURRICULUM
with BIOMOLCULAR ENGINEERING CONCENTRATION
(for students who enter the curriculum during or after the 2012-2013 academic year)

Freshman Year

CES 102	Engineering Disciplines & Skills	2	CH E 130	Chemical Engineering Tools	2
CH 101	General Chemistry	4	CH 102	General Chemistry	4
ENGL 103	English Composition	3	MTHSC 108	Calculus of One Variable II	4
MTHSC 106	Calculus of One Variable I	4	PHYS 122	Physics with Calculus I	3
Arts and Humanities/Social Science[1]		3	Arts and Humanities/Social Science[1]		3
Semester Totals:		*16*			*16*

Sophomore Year

CH E 211	Intro to Chemical Engineering	4	ChE 220	Chemical Engr. Thermodynamics I	3
CH 223	Organic Chemistry	3	ChE 230	Fluids/Heat Transfer	4
MTHSC 206	Calculus of Several Variables	4	CH 224	Organic Chemistry	3
BIOL 110	Principles of Biology (w/Lab)	5	CH 229	Organic Chemistry Lab	1
Arts and Humanities/Social Science[1]		3	Biochemistry Option[2]		3
			BIOSC 434	Biochemistry Lab	2
Semester Totals:		*19*	Bio Title Check		*16*

Junior Year

CH E 307	Unit Operations Lab. I	3	CH E 321	Chemical Engr. Thermodynamics II	3
CH E 319	Engineering Materials	3	CH E 330	Mass Transfer & Separ. Proc.	4
BIOCH 431	Physical Biochemistry	3	Arts and Humanities/Social Science[1]		3
MTHSC 208	Intro. to Ord. Diff. Equations	4	BMOLE 425	Biomolecular Engineering	3
BIOE 302	Biomaterials	3	PHYS 221	Physics with Calculus II	3
Semester Totals:		*16*			*16*

Senior Year

CH E 407	Unit Operations Lab. II	3	CH E 353	Process Dynamics and Control	3
CH E 431	Chemical Process Design I	3	CH E 433	Process Design II	3
CH E 443	Chem. Engr. Senior Seminar I	1	CH E 444	Chem. Engr. Senior Seminar II	1
CH E 450	Chemical Reaction Engineering	3	Engineering Requirement[3]		3
Engineering Requirement[3]		3	Arts and Humanities/Social Science[1]		6
EX ST 411	Statistical Methods	3			
Semester Totals:		*16*			*16*

Total = 131 hrs.

Notes

[1] See Policy on Social Sciences and Humanities for Engineering Curricula. Six of these credit hours must also satisfy the Cross-Cultural Awareness and Science and Technology in Society Requirements.

[2] Select from BIOCH 305 or Ch 360.

[3] Select from CH E 401 or BMOLE 403, BMOLE 423, BMOLE 426, BMOLE 427, BE 428, MICRO 413

Note: No student may exceed two attempts, including a *W*, to complete successfully any CH E course.

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CLEMSON UNIVERSITY **Curriculum and Course Change System - Print Major Form**

Change Major Name: Chemical Engineering
Degree: BS
Effective Catalog Year: 2013
.. **Change Major Name to:**
.. **Change Degree to:** (CHE approval required)
X **Change Curriculum Requirements**
(Submit or upload Curriculum map in catalog format. CHE approval required for > 18 hours of changes)
.. **Change General Education Requirements**
(Must also submit a General Education Checklist)
.. **Add, Change or Delete Concentration(s)**
(Submit or upload Curriculum map in catalog format. CHE approval required)
.. **Add, Change or Delete Emphasis Area(s)**
Explanation: Currently all chemical engineering majors are required to take BIOCH 305. In the annual survey completed by chemical engineering seniors, up to half report that BIOCH 305 does not meet their perceived educational needs in content or format. The proposed change will broaden the options for chemical engineering students to fill the biochemistry requirement by selecting one course from three alternatives that have somewhat different content and approach to the subject: BIOCH 305, Ch 360, and BMOLE 425.
Form Originator: CHGDNG, Charles Gooding **Date Form Created:** 9/4/2012
Form Last Updated by: , **Date Form Last Updated:** 9/4/2012
Form Number: 5202

Approval

	9/4/12		10/5/2012
Chair, Department Curriculum Committee	Date	Chair, Undergraduate Curriculum Committee	Date
	9/4/12		
Department Chair	Date	Chair, Graduate Curriculum Committee	Date
	9/21/12		12/13/12
Chair, College Curriculum Committee	Date	Provost	Date
	9/24/12		12/14/12
College Dean	Date	President	Date

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CHEMICAL ENGINEERING CURRICULUM

(for students who enter the curriculum during or after the 2012-2013 academic year)

Freshman Year

CES 102	Engineering Disciplines & Skills	2	CH E 130	Chemical Engineering Tools	2
CH 101	General Chemistry	4	CH 102	General Chemistry	4
ENGL 103	English Composition	3	MTHSC 108	Calculus of One Variable II	4
MTHSC 106	Calculus of One Variable I	4	PHYS 122	Physics with Calculus I	3
Arts and Humanities/Social Science[1]		3	Arts and Humanities/Social Science[1]		3
Semester Totals:		*16*			*16*

Sophomore Year

CH E 211	Intro to Chemical Engineering	4	CH E 220	Chemical Engr. Thermodynamics I	3
CH 223	Organic Chemistry	3	CH E 230	Fluids/Heat Transfer	4
MTHSC 206	Calculus of Several Variables	4	CH 224	Organic Chemistry	3
PHYS 221	Physics with Calculus II	3	CH 229	Organic Chemistry Lab	1
Arts and Humanities/Social Science[1]		3	MTHSC 208	Intro. to Ord. Diff. Equations	4
Semester Totals:		*17*			*15*

Junior Year

CH E 307	Unit Operations Lab. I	3	CH E 321	Chemical Engr. Thermodynamics II	3
CH E 319	Engineering Materials	3	CH E 330	Mass Transfer & Separ. Proc.	4
CH 339	Physical Chemistry Lab.	1	CH 332	Physical Chemistry	3
ECE 307	Basic Electrical Engineering	2	CH 340	Physical Chemistry Lab.	1
ECE 309	Electrical Engineering Lab	1	Arts and Humanities/Social Science[1]		3
EX ST 411	Statistical Methods	3	Biochemistry Option[2] or Emphasis Area[3]		3
Biochemistry Option[2] or Emphasis Area[3]		3			
Semester Totals:		*16*			*17*

Senior Year

CH E 407	Unit Operations Lab. II	3	CH E 353	Process Dynamics and Control	3
CH E 431	Chemical Process Design I	3	CH E 433	Process Design II	3
CH E 443	Chem. Engr. Senior Seminar I	1	CH E 444	Chem. Engr. Senior Seminar II	1
CH E 450	Chemical Reaction Engineering	3	MICRO 413	Industrial Microbiology	3
Arts and Humanities/Social Science[1]		3	Emphasis Area[3]		3
Emphasis Area[3]		3	Arts and Humanities/Social Science[1]		3
Semester Totals:		*16*			*16*

Total = 129 hrs.

Notes

[1] See Policy on Social Sciences and Humanities for Engineering Curricula. Six of these credit hours must also satisfy the Cross-Cultural Awareness and Science and Technology in Society Requirements.

[2] Select one course from BIOCH 305, BMOLE 425, or Ch 360.

[3] See advisor for details. Nine credit hours devoted to completion of an emphasis area or approved minor are required. Emphasis areas are: Applied Engineering, Mathematics & Science; Biomolecular Science & Engineering; Polymeric Materials; Energy Studies; Environmental Engineering; Business Management.

Note: No student may exceed two attempts, including a *W*, to complete successfully any CH E course.