CHEMICAL ENGINEERING - PHARM TRACK - Catalog Year 2018

Total Credits = 127-128

Freshman Year *Fall* Semester

Course Code	Description	Cr	
CHM 101	General Chemistry Lec I (A1)	3	
CHM 102	General Chemistry I Lab	1	
EGR 105	Foundations of Engineering I (A4)	1	
MTH 141 +	Calculus I (A1, B3)	4	
PHY 203	Elementary Physics I (A1)	3	
PHY 273	Elementary Physics Lab I (A1)	1	
		13	

Freshman Year *Spring* Semester

Course Code	Description	Cr	
BIO 101	Principles of Biology I (A1)	3	
BIO 103	Principles of Biology I Lab (A1)	1	
CHM 112 +	General Chemistry II Lec	3	
CHM 114	General Chemistry II Lab	1	
ECN 201	Principles of Microeconomics (A2)	3	
EGR 106	Foundations of Engineering II (A4)	2	
MTH 142 +	Calculus II (A1, B3)	4	
		17	

Sophomore Year *Fall* Semester

Course Code	Description	Cr	
CHE 212	Chemical Process Calculations	3	
CHM 227 +	Organic Chemistry Lec I	3	
MTH 243 +	Calculus for Functions of Several Vars (A1, B3)	3	
	General Education Outcome(s)*	3	
	General Education Outcome(s)*	3	
		15	

Sophomore Year *Spring* Semester

Course Code	Description	Cr	
BIO 341 ***or*** CMB 311	Cell Biology ***or*** Intro Biochemistry	3	
CHE 213 +	Chemical Engineering Thermodynamics I	3	
CHE 232	Materials Science and Engineering	3	
CHE 272 +	Intro to Chemical Engineering Calculations	3	
MTH 244	Differential Equations	3	
		15	

Admission to the COE required for enrollment in "300" level and higher COE courses. Admission requires at least a 2.0 cumulative GPA and a C- or higher in each of the following; EGR 105 & 106, CHM 101/102, MTH 141 & 142, PHY 203/273, and either PHY 204/274 *or* CHM 112/114

Junior Year *Fall* Semester

Course Code	Description	Cr	
BIO 341 ***or*** CMB 311	Cell Biology ***or*** Intro Biochemistry	3	
BPS 301	Dosage Forms I	2	
BPS 315	Pharmaceutics II	4	
CHE 314 +	Chemical Engineering Thermodynamics II	3	
CHE 347	Transfer Operations I	3	
		15	

Junior Year *Spring* Semester

Course Code	Description	Cr	
BPS 425	Current Good Manufacturing Processes	3	
CHE 348	Transfer Operations II	3	
CHE 364 +	Chemical Kinetics and Reactor Design	3	
CMB 211	Intro Microbiology	4	
PHY 204	Elementary Physics II (A1)	3	
PHY 274	Elementary Physics Lab II (A1)	1	
		17	

Senior Year *Fall* Semester

Course Code	Description	Cr	
CHE 425	Process Dynamics and Control	3	
CHE 428	Professional Experience	1	
CHE 445	Chemical Engineering Lab I	2	
CHE 449	Transfer Operations III	3	
CHE 451	Plant Design and Economics I	3	
	Approved Professional Elective**	3	
	General Education Outcome(s)*	3	
		18	

Senior Year *Spring* Semester

Course Code	Description	Cr	
CHE 446	Chemical Engineering Lab II	2	
CHE 452	Plant Design and Economics II (D1, C2)	3	
	Approved Professional Elective**	3	
	Approved Track Elective***	3-4	
	General Education Outcome(s)*	3	
	General Education Outcome(s)*	3	
		17-18	

* **General Education Outcomes:** if all Outcomes are satisfied in fewer spaces than provided, you must take a course of your choice (Free Elective) to fill each remaining space in order to meet the required earned credit total of your degree plan. See the "General Education Outcomes" section at the bottom of page two for more information on satisfying these requirements.

** **Professional Electives:** Half are to be 400-level or higher CHE courses taken at URI. A maximum of 6 credits in CHE 491 and 492 are applicable. The remaining courses are to be 300-level or higher in natural sciences, 400-level or higher in engineering (BME, CHE, CVE, ELE, ISE, MCE, OCE), or 400-level or higher in MTH. In addition, EGR 325, EGR 326, NUE 391, and NUE 392 are approved options.

*** **Track Elective:** CHE 466, 548, 550, 574; BPS 503, 542; PHY 430, 545

All professional and track electives require prior approval by CHE advisor.

\+ Course prerequisites include grade requirements in previous coursework, see catalog or eCampus course description for details

Name _____ **ID #** _____

CHEMICAL ENGINEERING - PHARMACEUTICAL TRACK - Catalog Year 2018 Total Credits = 127-128

SPECIFIED MATHEMATICS, SCIENCE, AND ENGINEERING COURSES

INTRODUCTORY ENGINEERING

Sem	Course	Cr	Grade	QP	Note
	EGR 105 (A4)	1			
	EGR 106 (A4)	2			
		3			

MATHEMATICS

Sem	Course	Cr	Grade	QP	Note
	MTH 141 (A1 & B3)	4			
	MTH 142 (A1 & B3)	4			
	MTH 243 (A1 & B3)	3			
	MTH 244	3			
		14			

NATURAL SCIENCES

Sem	Course	Cr	Grade	QP	Note
	BIO 101 (A1)	3			
	BIO 103 (A1)	1			
	BIO 341	3			
	CHM 101 (A1)	3			
	CHM 102	1			
	CHM 112	3			
	CHM 114	1			
	CHM 227	3			
	CMB 211	4			
	CMB 311	3			
	PHY 203 (A1)	3			
	PHY 273 (A1)	1			
	PHY 204 (A1)	3			
	PHY 274 (A1)	1			
		33			

ENGINEERING SCIENCE AND DESIGN

Sem	Course	Cr	Grade	QP	Note
	CHE 212	3			
	CHE 213 (313)	3			
	CHE 232	3			
	CHE 272	3			
	CHE 314	3			
	CHE 347	3			
	CHE 348	3			
	CHE 364	3			
	CHE 425	3			
	CHE 428 (328)	1			
	CHE 445 (345) **[capstone]**	2			
	CHE 446 (346) **[capstone]**	2			
	CHE 449 (349)	3			
	CHE 451 (351) **[capstone]**	3			
	CHE 452 (352) **[capstone] (D1 & C2)**	3			
		41			

**PROFESSIONAL ELECTIVES

Sem	Course	Cr	Grade	QP	Note
		3			
		3			
		6			

***TRACK ELECTIVE

Sem	Course	Cr	Grade	QP	Note
		3-4			

PHARMACY

Sem	Course	Cr	Grade	QP	Note
	BPS 301	2			
	BPS 315	4			
	BPS 425	3			
		9			

*GENERAL EDUCATION OUTCOMES

Science, Technology, Engineering, & Math (STEM) (A1)

Sem	Course	Cr	Grade	QP	Note
---	BIO, CHM, & PHY (see above)	15	---	---	---

Social and Behaviorial Sciences (A2)

Sem	Course	Cr	Grade	QP	Note
	ECN 201	3			

Humanities (A3)

Arts & Design (A4)

Sem	Course	Cr	Grade	QP	Note
---	EGR 105 & 106 (see above)	3	---	---	---

Write Effectively (B1)

Communicate Effectively (B2)

Mathematical, Statistical, or Computational Strategies (B3)

Sem	Course	Cr	Grade	QP	Note
---	MTH (see above)	11	---	---	---

Information Literacy (B4)

Civic Knowledge & Responsibilities (C1)

Global Responsibilities (C2)

Sem	Course	Cr	Grade	QP	Note
---	CHE 452 (see above)	---	---	---	---

Diversity & Inclusion (C3)

Ability to Synthesize (D1)

Sem	Course	Cr	Grade	QP	Note
---	CHE 452 (see above)	3	---	---	---

Grand Challenge (at least one course must be coded with a "G")

Free Elective

If you fulfill all Outcomes in fewer spaces than indicated on page one, you must use those additional spaces to take a course(s) of your choice to reach your degree credit total (127-128)

* **General Education Outcomes:** at least 40 credits must be completed. (A1-D1) must be met by at least three credits. A single course may satisfy one or two outcomes, and at least one course must be a "Grand Challenge". No more than twelve credits can be from the same course code except HPR. General education courses may also be used to meet requirements of your major(s) or minor(s) when appropriate.

** **Professional Electives:** Half are to be 400-level or higher CHE courses taken at URI. A maximum of 6 credits in CHE 491 and 492 are applicable. The remaining courses are to be 300-level or higher in natural sciences, 400-level or higher in engineering (BME, CHE, CVE, ELE, ISE, MCE, OCE), or 400-level or higher in MTH. In addition, EGR 325, EGR 326, NUE 391, and NUE 392 are approved options.

*** **Track Elective:** CHE 466, 548, 550, 574; BPS 503, 542; PHY 430, 545

All professional and track electives require prior approval by a CHE advisor.