THE
UNIVERSITY
OF RHODE ISLAND

Appendix G

Revised 8/2016

Notice of Change form

Notice of Change for: Chemical Engineering Curriculum

Date: February 27, 2018

A. PROGRAM INFORMATION

1. **Name of institution**
   University of Rhode Island

2. **Name of department, division, school or college**

   Department: Chemical Engineering
   College: Engineering

3. **Intended initiation date of program change. Include anticipated date for granting first degrees or certificates, if appropriate.**

   Initiation date: Fall 2018
   First degree date: Spring 2019

4. **Intended location of the program**

   Kingston, Rhode Island (Main Campus)

5. **Summary description of proposed program (not to exceed 2 pages).**

   - Add NUE 391 and 392 as professional elective options for all Chemical Engineering Tracks.
   - Maximum of 6 credits in CHE 491 and 492 can be used to satisfy "professional elective requirements"
   - In Traditional Track, create a **science elective** option to replace the professional elective option as an automatic substitution for CHM 432. The science elective course options are CMB 311, 352, 421, 464; BIO 341; CHM 427, 521; PHY 430.
   - In Pharmaceutical track, Replace BPS 303 and 305 (total of 4 credits) with BPS 315 (4 credits) (pending approval of BPS 315 as a new course).

6. **If applicable, please include the existing URI catalog language and proposed catalog changes indicated in Track Changes.**

   (see attached addendum)

7. **Signature of the President**

David M. Dooley

The Department of Chemical Engineering (CHE) offers a curriculum leading to the Bachelor of Science (B.S.) degree in chemical engineering. The chemical engineering program is accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc. (www.abet.org). In addition to the major there are two available tracks: biology and pharmaceutical. The department also offers the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees.
Faculty: Professor Bothun, C*hairperson.* Professors Bose, Brown, Gregory, and Lucia; Associate Professors Greenfield and Rivero-Hudec; Assistant Professors Kennedy, Meenach, and Roxbury; Associate Research Professor Crisman; Professors Emeriti Barnett, Gray, Knickle, Rockett, and Rose.

The chemical engineer is concerned with the application and control of processes leading to changes in chemical composition. These processes are most frequently associated with the production of useful products (chemicals, fuels, metals, foods, pharmaceuticals, paper, plastics, and the like), but also include processes such as removal of toxic components from the blood by an artificial kidney, environmental cleanup, and semiconductor processing. The chemical engineer's domain includes more efficient production and use of energy, processing of wastes, and protection of the environment.

Chemical engineers have a strong foundation in chemistry, physics, mathematics, and basic engineering. Chemical engineering courses include thermodynamics, transport phenomena, mass transfer operations, materials engineering, process dynamics and control, kinetics, and plant design. The student has the opportunity to operate small-scale equipment and to visit local industry. Intensive work is undertaken in the solution of complex problems in which economics and optimization of engineering design are emphasized.

Department Mission Statement. We are a community in a common quest to create and distribute chemical engineering knowledge in order to prepare our graduates to be successful leaders and practitioners.
Program Educational Objectives.
Three to five years after graduation from the B.S. in chemical engineering, graduates will :

1. Practice or apply the principles of chemical engineering in a variety of employment areas.

2. Achieve professional success with an understanding and appreciation of ethical behavior, social responsibility, and diversity, both as individuals and in team environments.

3. Be capable of pursuing continued life-long learning through professional practice, further graduate education or other training programs in engineering science or other professional fields.

Student Outcomes. Chemical engineering students demonstrate knowledge in all outcomes required by ABET, Inc. which are listed in the college's student outcomes section of this catalog.
Program Description. URI's chemical engineering program is more than just a collection of courses and credit hours whose content reflects the required criteria. The program has also been carefully designed to prepare students for the profession of chemical engineering through study, experience, and practice. Through eight specific program goals, the department of chemical engineering at URI seeks to:
1) provide the necessary background in science, particularly chemistry, physics, and advanced mathematics through the study of differential equations, so that students will be able to continue their education in the engineering sciences, with depth of understanding, and learn to apply these subjects to the formulation and solution of engineering problems;

2) provide a broad cross section of fundamental engineering science courses, including some from other engineering disciplines so that our students will acquire an understanding of the way in which chemistry, physics, and mathematics have been and continue to be used to solve important engineering problems relevant to the general chemical engineering and engineering design;

3) provide students with experience in conducting and planning experiments in the modern engineering laboratory, including interfacing experiments with computers as well as interpreting the significance of resulting data and properly reporting results in well-written technical reports;

4) provide experience in the process of original chemical engineering design in the areas of equipment design, process design, and plant design through the process of formulating a design solution to a perceived need and then executing the design and evaluating its performance, including economic considerations and societal impacts if any, along with other related constraints, culminating in both written and oral presentations of results;

5) provide experience with the multifaceted aspects of using computers to solve problems and present results with word processing, spreadsheet, presentation, and professional-level applications software used for design and analysis; and provide for obtaining and using information on the World Wide Web;

6) provide a familiarity with professional issues in chemical engineering, including ethics, issues related to the global economy and to emerging technologies, and fostering of important job-related skills such as improved oral and written communications and experience in working in teams at a number of levels;

7) encourage students to become actively engaged in the student chapter of the American Institute of Chemical Engineers and other student organizations, and to continue these associations after graduation with an emphasis on the importance of lifelong professional development including the desirability of attending graduate school or otherwise obtaining continuing or advanced education; and

8) make available continuous individual advising throughout the entire undergraduate educational experience to insure that each student makes the most of the educational opportunities provided by URI, particularly those related to general education electives that might enhance an engineering education, and special programs such as internships, cooperative experience and especially the International Engineering Programs in Chinese, German, French, and Spanish which are a unique opportunity available to globally motivated URI engineering students.

Traditional Chemical Engineering Major.
The chemical engineering major requires 121 credits.
Freshman Year First semester: 13 credits
CHM 101 (3), 102 (1); EGR 105 (1); MTH 141 (4); and PHY 203 (3), 273 (1).
Second semester: 17 credits
CHM 112 (3), 114 (1); ECN 201 (3); EGR 106 (2); MTH 142 (4); and PHY 204 (3), 274 (1).
Sophomore Year First semester: 12 credits
CHE 212 (3); CHM 227 (3); MTH 243 (3); and general education outcome(s)[43] (3).
Second semester: 15 credits
CHE 232 (3), 272 (3), 313 (3); CHM 228 **or** BCH 311 (3); and MTH 244 (3).
Junior Year First semester: 17 credits
CHE 314 (3), 347 (3); CHM 335 (2), 431 (3); approved mathematics elective[1] (3); and general education outcome(s)[43] (3).
Second semester: 15 credits
CHE 348 (3), 364 (3); CHM 432 **or** approved science~~professional~~ elective[1] (3); and general education outcome(s)[43] (6).
Senior Year First semester: 18 credits
CHE 345 (2) **[capstone]**, 449 (3), 451 (3) **[capstone]**, 425 (3), 428 (1); approved professional elective[2] (3); and general education outcome(s)[43] (3).
Second semester: 14 credits
CHE 346 (2) **[capstone]**, 452 (3) **[capstone]**; and approved professional electives[2] (9).
1*Mathematics Elective Requirement:* MTH 215 **or** any 300-, 400-, or 500-level MTH course ***except*** MTH 381.
[2]*Professional Elective Requirements:* half of the professional electives are to be 400-level or higher CHE courses taken at URI. A maximum of 6 credits in CHE 491 and 492 may be applied. In addition EGR 325, ~~and~~ EGR 326, NUE 391, and NUE 392 are permissible approved professional electives. The remaining courses are to be 300-level or higher in natural science, 400-level or higher in engineering (BME, CHE,

CVE, ELE, ISE, MCE, OCE), or 400-level or higher in MTH. ***All professional electives require prior approval by CHE advisor.***

[3] Or approved *Science Elective Requirement*: CMB 311, 352, 421, 464; BIO 341; CHM 427, 521; or PHY 430.

[4~~3~~]*General Education Outcomes (A1-D1): 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. A complete detailing of these requirements are listed in the college's curriculum requirements section of this catalog.*

Biology Track in Chemical Engineering. The primary motivation is to respond to advances in our understanding of biological processes at the molecular and macroscopic levels, and the unique opportunity for chemical engineers to translate that understanding to useful processes. The application of the chemical engineering paradigm to biology enables graduates to develop new molecular biology tools; drug delivery systems; artificial skin, organs and tissues; sensors and alternative fuels; and to integrate new bio-products into existing materials. The curriculum is founded on the core principles of transport phenomena, unit operations, thermodynamics, and reaction kinetics. Students take a series of five courses in biochemistry and cell and molecular biology. Besides preparing students for the biotechnology industry, this combination of biology, chemical engineering, and chemistry courses is relevant to those considering medical school.
This track follows a program similar to the traditional chemical engineering curriculum, but with biology and biochemistry courses replacing some of the other technical and science courses.

The chemical engineering major with biology track requires 124-126 credits.
Freshman Year First semester: 13 credits
CHM 101 (3), 102 (1); EGR 105 (1); MTH 141 (4); and PHY 203 (3), 273 (1).
Second semester: 17 credits
BIO 101 (3), BIO 103 (1); CHM 112 (3), 114 (1); ECN 201 (3); EGR 106 (2); and MTH 142 (4).
Sophomore Year First semester: 15 credits
CHE 212 (3), CHM 227 (3); MTH 243 (3); and general education outcome(s)[4] (6).
Second semester: 15 credits
BCH 311 (3) **or** BIO 341 (3); CHE 232 (3), 272 (3), 313 (3); and MTH 244 (3).
Junior Year First semester: 16 credits
BIO 341 (3) **or** BCH 311 (3); CHE 314 (3), 347 (3); PHY 204 (3), 274 (1); and general education outcome(s)[4] (3).
Second semester: 16-17 credits
CHE 348 (3), 364 (3); MIC 211 (4); approved track elective (3-4)[3]; and general education outcome(s)[4] (3).
Senior Year First semester: 18 credits
CHE 345 (2) **[capstone]**, 425 (3), 428 (1), 449 (3)~~, 451~~, 451 (3) **[capstone]**; approved professional elective[2] (3); and general education outcome(s)[4] (3).
Second semester: 14-15 credits
CHE 346 (2) **[capstone]**, 452 (3) **[capstone]**; approved mathematics elective[1] (3); approved professional elective[2] (3); and approved track elective[3] (3-4).

[1] *Mathematics Elective Requirement:* MTH 215 **or** any 300-, 400-, or 500-level MTH course ***except*** MTH 381.

[2] *Professional Elective Requirements:* half of the professional electives are to be any 400-level or higher CHE courses taken at URI. A maximum of 6 credits in CHE 491 and 492 may be applied. In addition EGR 325, ~~and~~ EGR 326, NUE 391, and NUE 392 are permissible approved professional electives. The remaining courses are to be 300-level or higher in natural science, 400-level or higher in engineering (BME, CHE, CVE, ELE, ISE, MCE, OCE), or 400-level or higher in MTH. ***All professional electives require prior approval by CHE advisor.***

[3]*Track Electives: CHE 466, 548, 550, 574; BPS 503, 542; BIO 352, 437, PHY 545.* ***All Track Electives require advisor approval.***

[4]*General Education Outcomes (A1-D1):* 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. A complete detailing of these requirements are listed in the college's curriculum requirements section of this catalog.

Pharmaceutical Track in Chemical Engineering. Biopharmaceuticals is one of the fastest growing industrial sectors both in the United States and worldwide, with a projected growth rate of ten percent

per year for the foreseeable future. Driving this rapid growth are the worldwide increase in average life span, major developments in our understanding of key factors behind the development of disease, and important innovations in drug formulations and delivery. This growth has created a need for graduates who are well-versed in the basic sciences as well as all technological aspects related to the development process for therapeutic agents—production, scale-up and processing, formulation and delivery, and regulatory constraints. The chemical engineering pharmaceutical track serves to meet this need, combining the well-known strengths of the College of Pharmacy with those of the department of chemical engineering, for a curriculum that will produce leaders in the pharmaceutical industry. This track follows the traditional chemical engineering curriculum, but with biology, biochemistry, and biomedical-and-pharmaceutical-science courses replacing some of the other technical and science courses.

The chemical engineering major with pharmaceutical track requires 127-128 credits.
Freshman Year First Semester: 13 credits
CHM 101 (3), 102 (1); EGR 105 (1); MTH 141 (4); and PHY 203 (3), 273 (1).
Second Semester: 17 credits
BIO 101 (3), BIO 103 (1); CHM 112 (3), 114 (1); ECN 201 (3); EGR 106 (2); and MTH 142 (4).
Sophomore Year First Semester: 15 credits
CHE 212 (3); CHM 227 (3); MTH 243 (3); and general education outcome(s)[3] (6).
Second Semester: 15 credits
BCH 311 (3) **or** BIO 341 (3); CHE 232 (3), 272 (3), 313 (3); and MTH 244 (3).
Junior Year First Semester: 15 credits
BCH 311 (3) **or** BIO 341 (3); BPS 301 (2), 315 (4)~~03 (2), 305 (2)~~; and CHE 314 (3), 347 (3).
Junior Year Second Semester: 17 credits
BPS 425 (3); CHE 348 (3), 364 (3); MIC 211 (4); and PHY 204 (3), 274 (1).
Senior Year First Semester: 18 credits
CHE 345 (2) **[capstone]**, 425 (3), 428 (1), 449 (3), 451 (3) **[capstone];** approved professional elective[1] (3); and general education outcome(s)[3] (3).
Senior Year Second Semester: 17-18 credits
CHE 346 (2) **[capstone]**, 452 (3) **[capstone];** approved professional elective[1] (3); approved track elective[2] (3-4); and general education outcome(s)[3] (6).
1*Professional Elective Requirements:* half of the professional electives are to be 400-level or higher CHE courses taken at URI. A maximum of 6 credits in CHE 491 and 492 may be applied. In addition EGR 325, ~~and~~ EGR 326, NUE 391, and NUE 392 are permissible approved professional electives. The remaining courses are to be 300-level or higher in natural science, 400-level or higher in engineering (BME, CHE, CVE, ELE, ISE, MCE, OCE), or 400-level or higher in MTH. ***All professional electives require prior approval by CHE advisor.***
[2]Track Elective: CHE 466, 548, 550, 574; BPS 503, 542; PHY 430, 545. **Track Elective requires advisor approval.**
3*General Education Outcomes (A1-D1):* 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. A complete detailing of these requirements are listed in the college's curriculum requirements section of this catalog.
International Engineering Program (IEP). In conjunction with the College of Arts and Sciences, the COE offers a five-year program in which students earn two degrees: a Bachelor of Science (B.S.) in engineering and a Bachelor of Arts (B.A.) in a foreign language. The foreign languages currently offered by the IEP are Chinese, German, French, Italian, and Spanish. The five-year program includes a year studying abroad. The first semester abroad is spent at the IEP's partner university taking engineering, language, and culture courses in the host language. The second six months abroad are spent in a paid professional internship working at an international engineering company or engaged in a research institute in Europe, Latin America, the Caribbean, or Asia. Upon graduation, students are well prepared to compete in the global marketplace and are highly sought after by employers both in the U.S. and abroad. Interested students should contact the IEP director at the Texas Instruments (TI) House on Upper College Road. The IEP has received several awards for excellence in international engineering education.
Minor in Nuclear Engineering. Qualified chemical engineering students may pursue a minor in nuclear engineering. Requirements for the minor can be found in the college's minors section. Additional information can be found at egr.uri.edu/nuclear-engineering-minor/

Accelerated Five-Year B.S./M.S. Degree Program. To qualify for this program, students must earn a cumulative GPA of 3.00 or higher while pursuing their B.S. degree. To ease the course load at the graduate level, candidates are encouraged to earn some graduate credits (e.g. one or two courses not required for their B.S. degree) during their senior year. Additional information can be obtained by contacting the department chairperson.

THE UNIVERSITY OF RHODE ISLAND

Jared Abdirkin <jabdirkin@uri.edu>

Re: CMB 311, 352, 422, and 464

1 message

Gongqin Sun <gongqinsun@uri.edu> Mon, Mar 19, 2018 at 12:02 PM
To: "J. Abdirkin" <jabdirkin@uri.edu>
Cc: Anne Veeger <aveeger@uri.edu>, Samantha Meenach <smeenach@uri.edu>, Geoffrey Bothun <gbothun@uri.edu>

Hi Jared,

Sure, you are welcome to use our courses as electives.

Gongqin

Gongqin Sun
Professor and Chair
Department of Cell and Molecular Biology
University of Rhode Island
Kingston, RI 02881
401-874-5937

On Mon, Mar 19, 2018 at 7:49 AM, J. Abdirkin <jabdirkin@uri.edu> wrote:

> Good Morning Gongqin and Anne,
>
> Can you please let us know if it's OK to include the CMB courses outlined below as options for our Chemical Engineering-Traditional Track students to choose from in a new "Science Elective" requirement?
>
> A response either way is appreciated so we can amend our final legislation accordingly.
>
> Thank you,
>
> Jared
>
> *Jared B. Abdirkin*
>
> Assistant Dean
>
> College of Engineering
>
> The University of Rhode Island
>
> www.uri.edu/coe
>
> On Sun, Mar 11, 2018 at 2:41 PM, J. Abdirkin <jabdirkin@uri.edu> wrote:
>
> > Good Afternoon Gongqin and Anne,

The Chemical Engineering "traditional track" program would like to include the following four Cell and Molecular Biology courses as potential options for their students (among 9 total courses from other programs as well). Students would only complete one of these courses for this new ategory ("Science Elective"). As you know, as part of the Faculty Senate processes to confirm curricular updates we need to have written agreement from the respective programs whose courses we are specifically naming to fulfill a degree requirement:

CMB 311 "Introductory Biochemistry"

CMB 352 "General Genetics"

CMB 422 "Introduction to the Bilogy of Genetics of Cancer" (Samantha and Geoff, there is no CMB 421, you meant this course right?)

CMB 464 "Biochmeistry of Metabolic Disease"

Thank you,

Jared

Jared B. Abdirkin

Assistant Dean

College of Engineering

The University of Rhode Island

www.uri.edu/coe

THE UNIVERSITY OF RHODE ISLAND

Jared Abdirkin <jabdirkin@uri.edu>

Re: BIO 341

1 message

Chair, URI Dept. of Biological Sciences <bio_chair@etal.uri.edu> Mon, Mar 12, 2018 at 2:41 PM
To: Jared Abdirkin <jabdirkin@uri.edu>

Hi, Jared -

thanks for asking; we approve! Best -

Evan

On Sun, Mar 11, 2018 at 5:33 PM, Evan Preisser <preisser@uri.edu> wrote:

Evan Preisser, Professor & Chair
Dept. of Biological Sciences
University of Rhode Island, Kingston RI 02881
401-874-2120; preisser@uri.edu
---------- Forwarded message ----------
From: "J. Abdirkin" <jabdirkin@uri.edu>
Date: Mar 11, 2018 2:46 PM
Subject: BIO 341
To: "Evan Preisser" <preisser@uri.edu>
Cc: "Samantha Meenach" <smeenach@uri.edu>, "Geoffrey Bothun" <gbothun@uri.edu>, "Anne Veeger" <aveeger@uri.edu>

Good Afternoon Evan,

The Chemical Engineering "traditional track" program would like to include the following Biology course as a potential option for their students (among 9 total courses from other programs as well). Students would only complete one of these courses for this new category ("Science Elective"). As you know, as part of the Faculty Senate processes to confirm curricular updates we need to have written agreement from the respective programs whose courses we are specifically naming to fulfill a degree requirement:

BIO 341 "Principles of Cell Biology"

Thank you,

Jared

Jared B. Abdirkin

Assistant Dean

College of Engineering

The University of Rhode Island

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--
Evan Preisser, Professor & Chair
Department of Biological Sciences
University of Rhode Island
Kingston RI 02881 USA
(p) 401-874-2120

THE UNIVERSITY OF RHODE ISLAND

Jared Abdirkin <jabdirkin@uri.edu>

Re: BPS 315

1 message

Norma Owens <normaowens@uri.edu> Sun, Mar 11, 2018 at 7:20 PM
To: "J. Abdirkin" <jabdirkin@uri.edu>

Hi Jared,

Yes, BPS 315 passed all the College of Pharmacy committees and was submitted to the CAC on Friday.

Thanks for your help and cooperation!

Norma

Norma J. Owens, PharmD, FCCP
Professor of Pharmacy
Associate Dean of Student and Academic Affairs
College of Pharmacy
University of Rhode Island

On Sun, Mar 11, 2018 at 2:28 PM, J. Abdirkin <jabdirkin@uri.edu> wrote:

> Hi Norma,
>
> Can you please confirm that you support Chemical Engineering adding BPS 315 (in place of 303 and 305) as a curriculum requirement on behalf of the College of Pharmacy? I need to include such confirmation in CHE's curriculum modifications proposal to the Faculty Senate.
>
> Sincerely,
>
> Jared
>
> *Jared B. Abdirkin*
>
> Assistant Dean
>
> College of Engineering
>
> The University of Rhode Island
>
> www.uri.edu/coe

More

Re: CHM 427 and 521

Inbox x

Dr. James Smith (Chemistry Department (9:29 AM (10 minutes ago)

to me

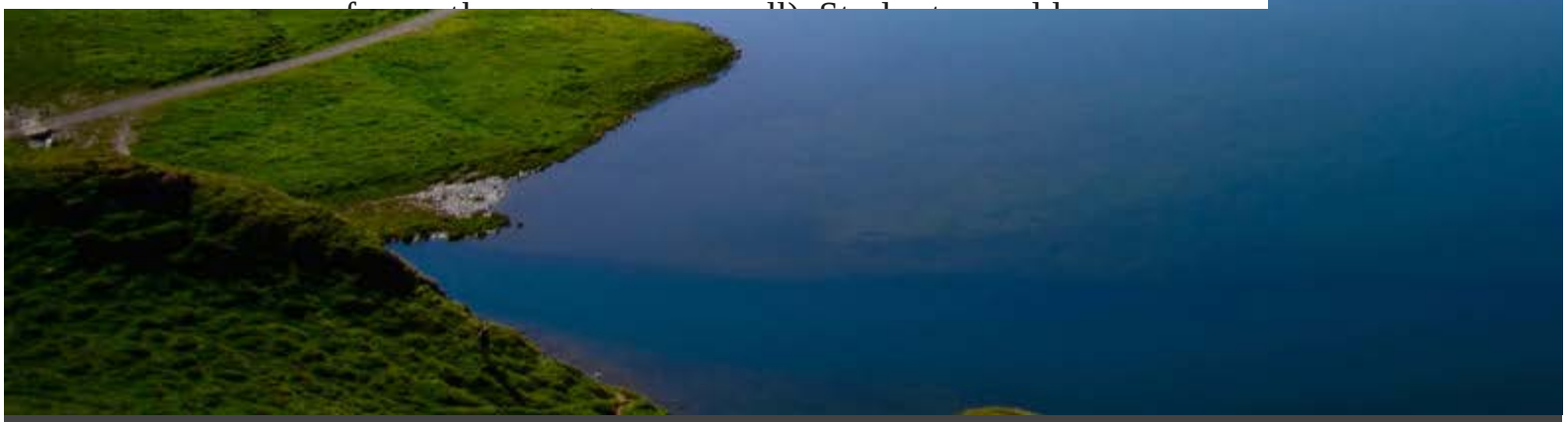
Hi Jared:

The chemistry program has plenty of capacity for chemical engineering students in CHM427 and CHM521 and we would be pleased to have them in these classes. Please note that the prerequisites would apply (i.e. CHM228/226).

Best regards, Jim Smith.

On 3/11/2018 2:49 PM, J. Abdirkin wrote:

> Good Afternoon Jim,
>
> The Chemical Engineering "traditional track" program would like to include the following Chemistry courses as a potential option for their students (among 9 total



More

Re: PHY 430

Inbox x

Oleg Andreev 5:01 PM (15 hours ago)

to me, David, Nancy, Samantha, Geoffrey

Dear Jared,
We fully support this initiative. Professor Yana Reshetnyak is a course instructor for PHY430, she can provide more information if you would need. What kind letter would you need and to whom it should be addressed?
Best regards
Oleg

On Sun, Mar 11, 2018 at 2:51 PM, J. Abdirkin <jabdirkin@uri.edu> wrote:

> Good Afternoon Oleg and David,
>
> The Chemical Engineering "traditional track" program would like to include the following Physics course as a potential option for their students (among 9 total courses from other programs as well). Students would only complete one of these courses for this new category ("Science Elective"). As you know, as part of the

CHEMICAL ENGINEERING - Class of 2022 (DRAFT)

Total Credits = 121

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	
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 (B3)	4	
PHY 204	Elementary Physics II (A1)	3	
PHY 274	Elementary Physics Lab II (A1)	1	
		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	
		12	

Sophomore Year *Spring* Semester

Course Code	Description	Cr	
CHE 232	Materials Science and Engineering	3	
CHE 272	Intro to Chemical Engineering Calculations	3	
CHE 313	Chemical Engineering Thermodynamics I	3	
CHM 228 + ***or*** CMB 311	Organic Chemistry Lec II **or** Introductory Biochemistry	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	
CHE 314	Chemical Engineering Thermodynamics II	3	
CHE 347	Transfer Operations I	3	
CHM 335	Physical Chemistry Lab	2	
CHM 431 +	Physical Chemistry I	3	
	Approved Mathematics Elective**	3	
	General Education Outcome(s)*	3	
		17	

Junior Year *Spring* Semester

Course Code	Description	Cr	
CHE 348	Transfer Operations II	3	
CHE 364	Chemical Kinetics and Reactor Design	3	
CHM 432 +	Physical Chemistry II***	3	
	General Education Outcome(s)*	3	
	General Education Outcome(s)*	3	
		15	

Senior Year *Fall* Semester

Course Code	Description	Cr	
CHE 345	Chemical Engineering Lab I	2	
CHE 425	Process Dynamics and Control	3	
CHE 428	Professional Experience	1	
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 346	Chemical Engineering Lab II	2	
CHE 452	Plant Design and Economics II (D1, C2)	3	
	Approved Professional Elective****	3	
	Approved Professional Elective****	3	
	Approved Professional Elective****	3	
		14	

* **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.

** **Mathematics Elective:** MTH 215 or any 300-, 400-, or 500-level MTH course ***except*** MTH 381.

*** Or approved **Science Elective:** BIO 341; CHM 427, 521; CMB 311, 352, 421, 464; PHY 430

**** **Professional Electives:** Half of the Professional Electives are to be 400-level or higher CHE courses taken at URI. A maximum of 6 credits in CHE 491 and 492 may be applied. In addition EGR 325, EGR 326, NUE 391, and NUE 392 are permissible approved professional electives. 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. ***All professional electives require prior approval by CHE advisor.***

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

CHEMICAL ENGINEERING - BIOLOGY TRACK - Class of 2022 (DRAFT)

Total Credits = 124-126

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 (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 232	Materials Science and Engineering	3	
CHE 272	Intro to Chemical Engineering Calculations	3	
CHE 313	Chemical Engineering Thermodynamics I	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	
CHE 314	Chemical Engineering Thermodynamics II	3	
CHE 347	Transfer Operations I	3	
PHY 204	Elementary Physics II (A1)	3	
PHY 274	Elementary Physics Lab II (A1)	1	
	General Education Outcome(s)*	3	
		16	

Junior Year *Spring* Semester

Course Code	Description	Cr	
CHE 348	Transfer Operations II	3	
CHE 364	Chemical Kinetics and Reactor Design	3	
CMB 211	Intro Microbiology	4	
	Approved Track Elective**	3-4	
	General Education Outcome(s)*	3	
		16-17	

Senior Year *Fall* Semester

Course Code	Description	Cr	
CHE 345	Chemical Engineering Lab I	2	
CHE 449	Transfer Operations III	3	
CHE 425	Process Dynamics and Control	3	
CHE 428	Professional Experience	1	
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 346	Chemical Engineering Lab II	2	
CHE 452	Plant Design and Economics II (D1, C2)	3	
	Approved Mathematics Elective****	3	
	Approved Professional Elective***	3	
	Approved Track Elective**	3-4	
		14-15	

***** **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.

****** **Track Electives:** CHE 466, 548, 550, 574; BPS 503, 542; BIO 352, 437; PHY 545.
All track electives require prior approval by CHE advisor.

******* **Professional Electives:** Half of the Professional Electives are to be 400-level or higher CHE courses taken at URI. A maximum of 6 credits in CHE 491 and 492 may be applied. In addition EGR 325, EGR 326, NUE 391, and NUE 392 are permissible approved professional electives. The remaining courses are to be 300-level or higher in natural sciences, 400-level or higher in engineering (BME, CHE, CVE,

CHEMICAL ENGINEERING - PHARM TRACK - Class of 2022 (DRAFT)

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 (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 232	Materials Science and Engineering	3	
CHE 272	Intro to Chemical Engineering Calculations	3	
CHE 313	Chemical Engineering Thermodynamics I	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 345	Chemical Engineering Lab I	2	
CHE 425	Process Dynamics and Control	3	
CHE 428	Professional Experience	1	
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 346	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 of the Professional Electives are to be 400-level or higher CHE courses taken at URI. A maximum of 6 credits in CHE 491 and 492 may be applied. In addition EGR 325, EGR 326, NUE 391, and NUE 392 are permissable approved professional electives. 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.

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

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

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Appendix H

Revised 8/2016

Notice of Change form

Notice of Change for: **B.S. Degree in Electrical Engineering**
Date: **March 1, 2018**

A. PROGRAM INFORMATION

1. **Name of institution**
   University of Rhode Island

2. **Name of department, division, school or college**
   Department: Electrical, Computer, and Biomedical Engineering
   College: College of Engineering

3. **Intended initiation date of program change. Include anticipated date for granting first degrees or certificates, if appropriate.**
   Initiation date: Fall 2018
   First degree date: December 2018

4. **Intended location of the program**
   Kingston Campus, College of Engineering

5. **Summary description of proposed program (not to exceed 2 pages).**
   Currently, the curriculum allows professional electives to be drawn from a list; this change adds a new course in robotics, ELE/MCE/OCE 456, to the list. The catalog language change appears in the second footnote.

6. **If applicable, please include the existing URI catalog language and proposed catalog changes indicated in Track Changes.**

   University Catalog Description:

   The electrical engineering major requires 120–123 credits.

   Freshman Year First semester: 15 credits
   CHM 101 (3), 102 (1); ECN 201 (3); EGR 105 (1); MTH 141 (4); and general education outcome(s)[1] (3).

   Second semester: 15 credits
   CSC 200 (4); EGR 106 (2); ELE 101 (1); MTH 142 (4); and PHY 203 (3), 273 (1).

   Sophomore Year First semester: 17 credits
   ELE 201 (3), 202 (1); MTH 362 (3); PHY 204 (3), 274 (1); and general education outcome(s)[1] (6).

   Second semester: 15 credits
   ELE 205 (2), 206 (1), 212 (4), 215 (1); MTH 243 (3); and PHY 205 (3), 275 (1).

Junior Year First semester: 14 credits
ELE 313 (3), 331 (4), 338 (3), 339 (1); MTH 451 (3) **or** ISE 311 (3).

Second semester: 15 credits
ELE 301 (3), 302 (1), 314 (3), 322 (4), 343 (3), 344 (1).

Senior Year First semester: 14-16 credits
ELE 400 (1), 480 (3) ***[capstone]*** – **(*see note*)**

Second semester: 15-16 credits
ELE 481 (3) ***[capstone]*** – ***(see note)***

Note: *Senior Year total credits for two (2) semesters: 29–32. See your advisor for help in preparing a suitable program.* ***Required courses:*** professional elective[2] (4); professional electives[2] (9-12); general education outcome(s)[1](9).

[1]*General Education Outcomes (A1-D1): 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. A complete detailing of these requirements are listed in the college's curriculum requirements section of this catalog.*

[2]*Professional Elective Requirements:* Four (4) courses that satisfy ***both*** of the following:
(a) Three (3) courses from: ELE 401/402, 423, 425, 432, 435/436, 444/445, 447/448, 456, 457, 458/459,
and at least one (1) must be from: 401/402, 423, 432, 444/445, 447/448;
and at least one (1) must include a lab component (401/402, 435/436, 444/445, 447/448, 458/459).
(b) The fourth course must be from: an additional course ***from (a) above;*** BME/ELE 461; ELE 405/406, 408/409, 437, 438, 470; ***with prior approval*** of the electrical, computer, and biomedical engineering department chairperson, any other 300-, or 400-level College of Engineering course not required by the ELE major.

7. Signature of the President

_____
David M. Dooley

ELECTRICAL ENGINEERING - Class of 2022 (DRAFT)

Total Credits = 120 -123

Freshman Year *Fall* Semester

Course Code	Description	Cr	
CHM 101	General Chemistry Lec I (A1)	3	
CHM 102	General Chemistry I Lab	1	
ECN 201	Principles of Microeconomics (A2)	3	
EGR 105	Foundations of Engineering I (A4)	1	
MTH 141 +	Calculus I (A1, B3)	4	
	General Education Outcome(s)*	3	
		15	

Freshman Year *Spring* Semester

Course Code	Description	Cr	
CSC 200	Computer Problem Solving	4	
EGR 106	Foundations of Engineering II (A4)	2	
ELE 101	Intro to Electrical Engineering	1	
MTH 142 +	Calculus II (B3)	4	
PHY 203	Elementary Physics I (A1)	3	
PHY 273	Elementary Physics Lab I (A1)	1	
		15	

Sophomore Year *Fall* Semester

Course Code	Description	Cr	
ELE 201	Digital Circuit Design	3	
ELE 202	Digital Circuit Design Lab	1	
MTH 362	Advanced Engineering Mathematics I	3	
PHY 204	Elementary Physics II (A1)	3	
PHY 274	Elementary Physics Lab II (A1)	1	
	General Education Outcome(s)*	3	
	General Education Outcome(s)*	3	
		17	

Sophomore Year *Spring* Semester

Course Code	Description	Cr	
ELE 205	Microprocessors	2	
ELE 206	Microprocessor Lab	1	
ELE 212 +	Linear Circuit Theory	4	
ELE 215	Linear Circuits Lab	1	
MTH 243 +	Calculus for Functions of Several Vars (A1, B3)	3	
PHY 205	Elementary Physics III Lec (A1, B3)	3	
PHY 275	Elementary Physics III Lab (A1, B3)	1	
		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	
ELE 313 +	Linear Systems	3	
ELE 331	Intro to Solid State Devices	4	
ELE 338 +	Electronics I	3	
ELE 339	Electronics I Lab	1	
MTH 451 ***or*** ISE 311	Intro to Probability and Statistics ***or*** Probability and Statistics for Engineers	3	
		14	

Junior Year *Spring* Semester

Course Code	Description	Cr	
ELE 301	Electronic Design Automation	3	
ELE 302	Electronic Design Automation Lab	1	
ELE 314	Linear Systems and Signals	3	
ELE 322	Electromagnetic Fields I	4	
ELE 343	Electronics II	3	
ELE 344	Electronics II Lab	1	
		15	

Senior Year *Fall* Semester

Course Code	Description	Cr	
ELE 400	Intro to Professional Practice	1	
ELE 480 +	Capstone Design I (D1)	3	
	Professional Elective**	4	
	Professional Elective**	3-4	
	Professional Elective**	3-4	
		14 -16	

Senior Year *Spring* Semester

Course Code	Description	Cr	
ELE 481 +	Capstone Design II	3	
	Professional Elective**	3-4	
	General Education Outcome(s)*	3	
	General Education Outcome(s)*	3	
	General Education Outcome(s)*	3	
		15 -16	

***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:** ***Four (4)*** courses that satisfy ***both*** of the following:

(a) ***Three*** **(3)** courses from: ELE 401/402, 423, 425, 432, 435/436, 444/445, 447/448, 456, 457, 458/459,

and at least one **(1)** must be from; 401/402, 423, 432, 444/445, 447/448,

and at least one **(1)** must include a lab component (401/402, 435/436, 444/445, 447/448, 458/459);

and **(b)** The ***fourth*** course must be from: an additional course from ***(a) above;*** BME/ELE 461; ELE 405/406, 408/409, 437, 438, 470; with prior approval of the Electrical, Computer, and Biomedical Engineering department chairperson, any other 300- or 400-level College of Engineering course not required by the ELE major.

Notice of Change for B.S. Industrial and Systems Engineering
Date: 3/2/18

A. PROGRAM INFORMATION

1. Name of institution
University of Rhode Island

2. Name of department, division, school or college
Department: MCISE
College: COE

3. Intended initiation date of program change. Include anticipated date for granting first degrees or certificates, if appropriate.
Initiation date: Fall 2018
First degree date: Spring 2022

4. Intended location of the program
Kingston

5. Summary description of proposed program (not to exceed 2 pages).
The Industrial and Systems Engineering program is proposing several changes in the B.S. degree requirements. They are summarized as follows:

Attached is the new curriculum plan for Class of 2022, which includes the following changes:
1) ISE 220 – remove from curriculum
2) ISE 261G – add to curriculum
3) replace PHL 212 (ethics) with EGR 316G (engineering ethics)
4) Delete one "General Education" slot from Senior year, as newly required courses covering general education outcomes means less of these courses students will need to find on their own
5) replace MCE 263, CVE 220, and ELE 220 with a "technical elective" that allows students to choose two of the three courses that were previously all required
6) shift a professional elective from senior year, spring semester into spring of junior year so that students can be encouraged to enroll in electives that are only offered every other year
7) Change total credit count from 121-124 to 120
8) Renumber footnotes and add a footnote explaining the new technical elective

If applicable, please include the existing URI catalog language and proposed catalog language changes that relate to your request.

CURRENT:

The industrial and systems engineering major requires 121-124 credits.

Freshman Year First semester: 15 credits
CHM 101 (3), 102 (1); EGR 105 (1); MTH 141 (4); and general education outcome(s)[1] (6).

Second semester: 16 credits
EGR 106 (2); MTH 142 (4); PHY 203 (3), 273 (1); and general education outcome(s)[1](6).

Sophomore Year First semester: 17 credits
[ISE 240 (3) *and* 241 (1) ***or*** MCE 201 (3) *and* ISE 220 (1)**]**; MCE 262 (3); MTH 243 (3); PHL 212 (3); and PHY 204 (3), 274 (1).

Second semester: 16 credits
CVE 220 (3); **[**ISE 240 (3) *and* 241 (1) ***or*** MCE 201 (3) *and* ISE 220 (1)**]**; MCE 263 (3); MTH 362 **or** 244 (3); and Science Elective[2] (3).

Junior Year First semester: 15 credits
BUS 201 (3); CHE 333 (3); and ISE 311 (3), 325 (3), 332 (3).

Second semester: 15 credits
ELE 220 (3); ISE 304 (3), 312 (3), 333 (3); 334 (3).

Senior Year First semester: 12 credits
ISE 401 (3) **[capstone]**, 420 (3), 451 (3); and professional elective[3] (3).

Second semester: 15 credits
ISE 402 (3) **[capstone]**; professional electives[3] (9); and general education outcome(s)[1] (3).

[1]*General Education Outcomes (A1-D1): 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. A complete detailing of these requirements are listed in the college's curriculum requirements section of this catalog.*

[2]*Science Elective:* choose from CHM 112, CHM 124, KIN 122, NRS 100, or PHY 205 and PHY 275

[3]*Professional Elective Requirements:* Must be satisfied by twelve (12) credits of professional electives, at least six (6) of which must be 400- or 500-level ISE courses not required by the ISE major. The remaining courses may be any 300-, 400-, or 500- level courses offered by the College of Engineering not required by the ISE major, CSC, MTH, or PHY (except CHE 428, 451, 452; CSC 320; MTH 381, 420, 451, 452; PHY 322, 381, 382; courses in professional practice; seminars); BUS 320, 341, 344, 355, 365, 420, 443, 444, 448, 449 450; ECN 323, 324, 327, 328, 344, 363, 368, 376; any 500-level STA courses (except STA 532); MBA 530, 550 (requires ISE/MBA 4+1 Admission); PSY 335, 384, 385, 434. *Note*: Only ISE 513 or STA 513 will be allowed – not both (these are cross-listed courses).

PROPOSED:

The industrial and systems engineering major requires 120 ~~121-124~~ credits.

Freshman Year First semester: 15 credits
CHM 101 (3), 102 (1); EGR 105 (1); MTH 141 (4); and general education outcome(s)[1] (6).

Second semester: 16 credits
EGR 106 (2); MTH 142 (4); PHY 203 (3), 273 (1); and general education outcome(s)[1](6).

Sophomore Year First semester: ~~17~~ 16-17 credits
[ISE 240 (3) *and* 241 (1) ***or*** MCE 201 (3)~~ *and* ISE 220 (1)~~**]**; ISE 261G (3); MCE 262 (3); MTH 243 (3); ~~PHL 212 (3)~~; and PHY 204 (3), 274 (1).

Second semester: ~~16~~ 15-16 credits
EGR 316G (3); ~~CVE 220 (3);~~ **[**ISE 240 (3) *and* 241 (1) ***or*** MCE 201 (3)~~ *and* ISE 220 (1)~~**]**; Technical Elective (3)[2]; ~~MCE 263 (3);~~ MTH 362 **or** 244 (3); and Science ~~Elective~~[2] Elective[3] (3).

Junior Year First semester: 15 credits
BUS 201 (3); CHE 333 (3); and ISE 311 (3), 325 (3), 332 (3).

Second semester: 15 credits
~~ELE 220 (3);~~ ISE 304 (3), 312 (3), 333 (3); 334 (3) and professional elective[4] (3).

Senior Year First semester: ~~12~~ 15 credits
ISE 401 (3) **[capstone]**, 420 (3), 451 (3); professional ~~elective~~[3] elective[4] (3); general education outcome(s) [1] (3)

Second semester: ~~15~~12 credits
ISE 402 (3) **[capstone]**; Technical Elective (3)[2]; professional ~~electives~~[3] electives[4] (~~9~~6); ~~and general education outcome(s)[1] (3).~~

[1]*General Education Outcomes (A1-D1): 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. A complete detailing of these requirements are listed in the college's curriculum requirements section of this catalog.*

[2]*~~Science~~ [2]Technical Elective:* choose two of the three options of CVE 220, MCE 263, or ELE 220 ~~from CHM 112, CHM 124, KIN 122, NRS 100, or PHY 205 and PHY 275~~

[3] *Science Elective: choose from CHM 112, CHM 124, KIN 122, NRS 100, or PHY 205 and PHY 275*

[3]*~~Professional~~ [4]Professional Elective Requirements:* Must be satisfied by twelve (12) credits of professional electives, at least six (6) of which must be 400- or 500-level ISE courses not required by the ISE major. The remaining courses may be any 300-, 400-, or 500- level courses offered by the College of Engineering not required by the ISE major, CSC, MTH, or PHY (except CHE 428, 451, 452; CSC 320; MTH 381, 420, 451, 452; PHY 322, 381, 382; courses in professional practice; seminars); BUS 320, 341, 344, 355, 365, 420, 443, 444, 448, 449 450; ECN 323, 324, 327, 328, 344, 363, 368, 376; any 500-level STA courses (except STA 532); MBA 530, 550 (requires ISE/ MBA 4+1 Admission); PSY 335, 384, 385, 434. *Note*: Only ISE 513 or STA 513 will be allowed – not both (these are cross-listed courses).

6. Signature of the President

_____

David M. Dooley

INDUSTRIAL AND SYSTEMS ENGINEERING - Class of 2022

(DRAFT)

Total Credits = 120

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	
	General Education Outcome*	3	
	General Education Outcome*	3	
		15	

Freshman Year *Spring* Semester

Course Code	Description	Cr	
EGR 106	Foundations of Engineering II (A4)	2	
MTH 142 +	Calculus II (B3)	4	
PHY 203	Elementary Physics I (A1)	3	
PHY 273	Elementary Physics Lab I (A1)	1	
	General Education Outcome*	3	
	General Education Outcome*	3	
		16	

Sophomore Year *Fall* Semester

Course Code	Description	Cr	
ISE 240 and 241 ***or*** MCE 201	Mfg Processes & Systems (3), Mfg Processes & Systems Lab (1) / Engineering Graphics (3)	4 or 3	
ISE/SUS 261G	Sustainable Lean Production (A1, B4, G)	3	
MCE 262	Statics	3	
MTH 243 +	Calculus for Functions of Several Vars (A1, B3)	3	
PHY 204	Elementary Physics II (A1)	3	
PHY 274	Elementary Physics II Lab (A1)	1	
		16-17	

Sophomore Year *Spring* Semester

Course Code	Description	Cr	
EGR 316G	Engineering Ethics (A3, C1, G)	3	
ISE 240 and 241 ***or*** MCE 201	Mfg Processes & Systems (3), Mfg Processes & Systems Lab (1) / Engineering Graphics (3)	4 or 3	
	Technical Elective**	3	
MTH 362 ***or*** MTH 244	Advanced Engineering Mathematics I ***or*** Differential Equations	3	
	Science Elective***	3	
		15-16	

Junior Year *Fall* Semester

Course Code	Description	Cr	
BUS 201	Financial Accounting	3	
CHE 333	Engineering Materials	3	
ISE 311	Probability & Statistics for Engineers	3	
ISE 325	Computer Tools for Engineers	3	
ISE 332	Deterministic Systems	3	
		15	

Junior Year *Spring* Semester

Course Code	Description	Cr	
ISE 304	Engineering Econ and Proj Planning	3	
ISE 312	Statistical Methods & Quality Systems	3	
ISE 333	Stochastic Systems	3	
ISE 334	Simulation Modeling and Analysis	3	
	Professional Elective****	3	
		15	

Senior Year *Fall* Semester

Course Code	Description	Cr	
ISE 401	ISE Capstone Design I	3	
ISE 420	Intro To Human Factors & Ergonomics	3	
ISE 451	Production System Design	3	
	Professional Elective****	3	
	General Education Outcome*	3	
		15	

Senior Year *Spring* Semester

Course Code	Description	Cr	
ISE 402	ISE Capstone Design II (D1)	3	
	Technical Elective**	3	
	Professional Elective****	3	
	Professional Elective****	3	
		12	

* **General Education Outcomes:** If all Outcomes are satisfied in fewer spaces than provided, you must take a course of your choice (Free Elective) to reach a minimum of 120 credits. See the "Genereal Education Outcomes" section at the bottom of page two for details on satisfying these requirements

** **Technical Elective:** Choose two of the three options of CVE 220, MCE 263, or ELE 220

*** **Science Elective:** Choose from CHM 112, CHM 124, KIN 122, NRS 100, or PHY 205/275

****

Professional Electives: Must be satisfied by ***twelve (12) credits*** of professional electives, ***at least six (6)*** of which must be 400- or 500-level ISE courses not required by the ISE major. The ***remaining courses*** may be any 300-, 400-, or 500- level courses offered by the College of Engineering not required by the ISE major, CSC, MTH, or PHY (***except*** CHE 428, 451, 452; CSC 320; MTH 381, 420, 451, 452; PHY 322, 381, 382; courses in professional practice; seminars); BUS 320, 341, 344, 355, 365, 420, 443, 444, 448, 449, 450; ECN 323, 324, 327, 328, 344, 363, 368, 376; any 500-level STA courses (except STA 532); MBA 530, 550 (requires ISE/MBA 4+1 admission); PSY 335, 384, 385, 434. Note: Only ISE 513 or STA 513 will be allowed – not both (these are cross-listed courses).

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Appendix J

REVISED 12/2016

Modified Form
For New Interdisciplinary Minors, and New Tracks/Options/Sub-plans/Concentrations

A Proposal for a new concentration: "Concentration in Naval Science and Technology"

Date: September 25, 2017

A. PROGRAM INFORMATION

A1. Name of institution University of Rhode Island

A2. Name of department, division, school or college
Departments: BME, CPE, CHE, CVE, ELE, ISE, MCE, and OCE (all undergraduate programs in the College of Engineering).

A3. Title of proposed program and Classification of Instructional Programs (CIP) code
Program title: Concentration in Naval Science and Technology
Classification code (CIP): 14

A4. Intended initiation date of program change. Include anticipated date for granting first degrees or certificates, if appropriate.
Initiation date: 1/1/2018
First degree date: May 2019

A5. Intended location of the program
Kingston, RI

A6. Description of institutional review and approval process

	Approval Date
Department	N/A
College	
CAC/Graduate Council	
Faculty Senate	
President of the University	

A7. Summary description of proposed program (not to exceed 2 pages)

The University of Rhode Island and the University of Connecticut recently won a three year $1.3 million grant from the Office of Naval Research to create a community of students, faculty, government and industry leaders that will strive to expand the Navy science and technology workforce. The grant links these universities with local Navy stakeholders to create the *Southeast New England STEM Coalition*. Principal investigators at URI are engineering faculty members David Taggart (URI Campus Director) and James Miller and Arun Shukla (URI Research Leads). Ray Wright, URI Dean of Engineering serves on the Coalition Advisory Board, along with UConn's Dean of Engineering and

representatives from local industry. Rhode Island and Connecticut represent a critical region for the Navy. The area is the primary supplier of Naval submarines and has some 600 firms that provide parts for the submarine fleet. The region is home to the Naval Undersea Warfare Center, in Newport, as well as Raytheon, in Portsmouth, and Electric Boat, in Groton, Conn., where a dramatic increase in hiring is expected. This concentration will lead to new opportunities for engineering undergraduates considering Navy-related careers, will encourage more students to consider engineering fields in the Navy and will address the increasing regional demand for a highly specialized workforce.

As part of the coalition, URI and UConn plans to launch a new *Concentration in Naval Science and Technology* in which students will take seminar-style classes featuring guest speakers from local Navy contractors and the Naval Undersea Warfare Center, URI and UConn faculty and students performing Navy-related research or design projects. Students, typically seniors, will conduct Navy-based undergraduate research and design projects involving new Navy technologies and mentors from the Navy will be encouraged. On both campuses, students will be asked to join Navy-related academic, social and professional development activities. Workshops, seminars and networking events will be held regularly, with the two campuses sharing speakers and co-sponsoring talks. The program also involves outreach to community college and high school students. URI and UConn engineering students have been participating in internships in the Navy and Navy-related firms for years. The grant will allow the universities to build on those relationships and create new opportunities.

This proposal is a request for approval for a new *Concentration in Naval Science and Technology*. As detailed below, the 9 credit concentration includes 3 credits of a new seminar course in Naval Science and Technology (1 credit taken three times) and 6 credits of special problem research and/or senior capstone design in an area related to Naval Science and Technology. It is anticipated that these activities will contribute to the growth of a vibrant technical community and will lead to enhanced partnerships so that we can maintain the concentration into the future. Our regional partners are expected to provide continued support in the form of seminar speakers and funding for undergraduate research and senior design projects.

A8. Signature of the President

_____

David M. Dooley

A9. Person to contact during the proposal review

Name: David G. Taggart
Title: Professor of Mechanical Engineering
Phone: 874-5934
Email: taggart@uri.edu

A10. List and attach any signed agreements for any cooperative arrangements made with other institutions/agencies or private companies in support of the program.

Office of Naval Research STEM Grant: "Southeast New England Naval STEM Coalition: Advancing the Navy's STEM Education and Workforce Capabilities," in collaboration with the University of Connecticut, Award dates 9/1/17-8/31/20

B. RATIONALE: There should be a demonstrable need for the program.

B1. Why is the new program being developed?

The new concentration will lead to new opportunities for engineering undergraduates considering Navy-related careers, will encourage more students to consider engineering fields in the Navy-related technologies and will address the increasing regional demand for a highly specialized workforce in this area.

B2. What is the economic need and workforce data related to the program?

a. Provide information on jobs available as a result of successfully completing the certificate or degree: job titles, job outlook/growth, and salaries.

Current education and workforce training infrastructure in Southeast New England is straining to keep pace with government and industry requirements for next generation technology and professional workforce in naval undersea technologies. With a dramatic increase in hiring anticipated for EB and an expected loss of experienced, skilled workforce due to retirements, workforce training is a critical need for the region. With work proceeding for the Virginia and Columbia class submarines, EB expects to increase its current workforce of approximately 14,000 workers to 18,000 while also continuing to hire to replace ongoing retirements. This hiring comes on the heels of the increase of approximately 4,000 workers since 2012. According to Congressman Joe Courtney (D-CT), workforce issues at EB are "the No. 1 question" raised by the Navy. Additionally, EB is alerting its supply chain to be prepared for a significant increase in production, which will place further demands on the regional workforce. In addition to highly skilled bachelor degree graduates, federal facilities such as NUWC have an ongoing demand for graduates with masters and doctoral degrees who are also U.S. citizens. An increasing concern is the lack of domestic students nationally who choose to pursue advanced degrees. Thus, a need exists for undergraduate workforce development programs that also serve as a pipeline for graduate school.

B3. What entities are advocating for this program? Was an advisory board used to develop the curriculum?

In developing the proposed Concentration, input was solicited from major partners, including colleagues at NUWC, General Dynamics Electric Boat and Raytheon, all of whom provided letters of support for our funding request to the Office of Naval Research's Office of Education and Workforce. The newly created Southeast New England STEM Coalition will establish an advisory committee to assist the Coalition leadership team in meeting the goals of the concentration by providing expertise and counsel related to their experiences within the naval and academic communities. The advisory committee will advise on engagement with the naval community and will help the leadership team connect with personnel in the Navy and naval industry who can serve as mentors and project advisors. Formal advisory committee meetings are to be held twice per year.

C. INSTITUTIONAL ROLE: The program should be clearly related to the published role, scope, and mission of the institution and be compatible with other programs and activities of the institution.

C1. Explain how the program is consistent with the published role, scope, and mission of the institution and how it is related to the institution's Academic Plan.

The new concentration is consistent with numerous goals and strategies in URI's Academic Strategic Plan as detailed below:

Goal 1 — Enhance Student Success
Strategy 1 - Expand pedagogical approaches focused on engaging students in learning across the curriculum

By encouraging of students enrolled in all undergraduate engineering majors to participate in a College wide seminar series, research projects and senior design projects, novel pedagogical approaches will include increased faculty-student and student-student interaction

Strategy 2- Significantly expand opportunities for experiential learning within all majors, and restructure academic and career advising to better support students in meeting their life goals

The undergraduate research and design projects will provide opportunities for experiential learning projects. Also, student participation in the newly formed technical community will lead to internship and mentorship opportunities.

Goal 2 — Expand Research, Scholarship, and Creative Work
Strategy 1 - Broaden resources and support for significant growth in research opportunities with the state, nation, and world, and demonstrate value and recognition for multiple forms of scholarship

This new concentration includes the establishment of industry collaborations which will lead to new laboratory development and associated research opportunities for both undergraduate and graduate students in technical areas critical to both regional and national needs of the U.S. Navy.

Strategy 2 - Target research initiatives that impact economic and workforce development

The primary motivation of the new concentration is to address the increased regional demand for a highly specialized workforce in Navy-related technologies. Since the

regional economy is highly dependent on these technologies, the new concentration will support local economic development.

Strategy 3 - Involve undergraduate and graduate students in rich and varied research, creative projects and other opportunities

The research and design projects will provide students with opportunities for involvement in state-of-the-art technologies and will prepare them for employment in civilian Navy or Navy-related engineering positions and/or graduate study.

Goal 3 — Embrace Diversity and Social Justice

Strategy 1 - Increase the recruitment, retention, and graduation of students from underrepresented groups, and provide support for their inclusion and success in the academic environment

URI's College of Engineering has a strong existing diversity program in place to recruit students from underrepresented groups (http://egr.uri.edu/diversity/). The Coalition will actively coordinate with this program to ensure that underrepresented groups are encouraged to participate in the Concentration in Naval Science and Technology. Selected students who are enrolled in the concentration will serve as ambassadors and mentors to recruit both high school and undergraduate students from underrepresented groups.

D. INTER-INSTITUTIONAL CONSIDERATIONS:

D1. What are the similar programs in the state and region?

As part of the Southeast New England STEM Coalition, the University of Connecticut is introducing a similar academic concentration for engineering students.

a. If similar programs exist, how is this program different or why is duplication necessary?

Coordination with the University of Connecticut's program is a major component of the Southeast New England STEM Coalition. Many joint initiatives will be implemented to ensure that the undergraduates experience the naval community at a regional level. Joint activities will include an Annual Navy STEM Discovery Day event, the Naval Science and Technology seminar series, career development and career fair activities, and internships. In addition, opportunities for inter-campus work on research and senior design projects will be explored and offered to the extent possible. For example, senior design project teams might include members from both URI and UConn.

b. Have you communicated with other institutions about the development of this program and have any concerns been raised related to role, scope, and mission or duplication?

We are working closely with the University of Connecticut, particularly Senior Associate Dean of Engineering, Dr. Michael Accorsi, in developing our concentration. As described above, we anticipate some collaborative activities. Our advisory board will monitor our program activities to ensure effective coordination between URI and UConn.

D2. How do courses in this program transfer to other schools?

This concentration is unique to URI and UConn. As a result, students transferring between URI and UConn would be able to transfer credits taken toward the Concentration in Naval Science and Technology. We do not envision transfer credits to/from other institutions.

D3. How does this program align to academic programs at other institutions?

As detailed above, this concentration is being designed in parallel with a similar program being introduced at UConn.

D4. Are recipients of this credential accepted into programs at the next degree level without issue?

While completion of this concentration is not required for advanced study, participation in undergraduate research projects provides excellent preparation for graduate work.

D5. How does this program of study interface with degree programs at the level below them?

Not applicable

D6. Are cooperative agreements or affiliations established? If so, what?

As detailed above, this concentration has been prepared in collaboration with the University of Connecticut through the recently established Southeast New England Naval STEM Coalition.

E. PROGRAM:

E1. Are there pre-requisite courses? If so, please explain/list?

No

E2. Curriculum

a. How many credit hours are required to graduate (include all general education and pre-requisites)?

9 credits

b. What courses are required for the program?

EGR 201 – 1 credit (taken up to three times)
Remaining credits:
Navy-related research (BME, CHE, CVE, ELE, ISE, MCE or OCE 491/492)

and / or
Navy-related capstone design (BME 484 / 485, CHE 451 / 452, CVE 497 / 498, ELE 480 / 481, ISE 401 / 402, MCE 401 / 402 or OCE 495 / 496)

c. What are the new courses and descriptions that will go into the course catalog?

EGR 201 Seminar in Naval Science and Technology (1 credit)

d. Are there specializations and options? If so, please describe.

No

e. Is the program content guided by program-specific accreditation standards or other outside guidance?

No

f. What are the learning goals (what students are expected to gain, achieve, know, or demonstrate by completion of the program)?

1. Identify technology areas that align with each student's interests, engineering major and career goals.
2. Establish connections with engineers and scientists from local Navy contractors and the Naval Undersea Warfare Center.
3. Develop a plan for pursuing Navy-related engineering careers.
4. Make connections between undergraduate coursework and Navy technologies.
5. Make an informed decision regarding pursuit of graduate study.
6. Experience research or design in an area related to Navy technologies.

F. FACULTY AND STAFF: The faculty and support staff for the program should be sufficient in number and demonstrate the knowledge, skills, and other attributes necessary to the success of the program.

F1. What are the number of each needed?

One faculty member each year to teach EGR 201.
Several faculty per year to serve as advisors to research and capstone projects

F2. Are these new positions or reassignments?

Reassignments

F3. What are the minimal degree level and academic/technical field requirements and certifications required for teaching in this program?

Concentration courses will be taught by tenure-track or adjunct engineering faculty.

G. STUDENTS:

G1. How are students selected for the program?

All undergraduate engineering majors may participate. Interested students from science disciplines (such as biology, computer science, chemistry, and physics) will be considered on an individual basis, depending on availability of appropriate research or design projects.

G2. Are there admission requirements?

Enrollment in any engineering major, including UC-Engineering and Wanting Engineering

G3. What is the primary source of students?

a. New students or drawn from other programs?

Current undergraduate engineering students

b. Industry sponsored students/ employees? Describe.

None

G4. What is the estimated number of students in the program?

80-120

G5. What is the estimated number of annual graduates?

20-30

H. EVALUATION:

H1. How will the program be evaluated?

a. Performance measures to evaluate the program.

Enrollment in EGR 201
Enrollment in Navy-related special problems research courses
Enrollment in Navy-related senior design courses
Annual number of students completing concentration requirements
Placement in Navy-related engineering positions

b. Will the program be accredited? If so, when? How?

No

I. WHAT SPECIAL EQUIPMENT OR RESOURCES ARE NEEDED?

I1. Special instructional resources and services needed? (Clinical space, internships, proctors)

None

I2. Facilities and capital equipment?

If teleconferencing equipment is needed for joint seminars, funds from the ONR STEM grant are available.

J. IS THE PROGRAM FINANCIALLY VIABLE?

J1. ALL PROPOSALS: Complete the Rhode Island Office of Postsecondary Commissioner Budget Form demonstrating either

a. the need for additional resources

No additional resources or revenues are anticipated

b. that existing funds are sufficient for carrying out the program.

For fiscal years 2017, 2018 and 2019, Office of Naval Research funds will be available to defray costs for materials and supplies for undergraduate research and senior design projects. Beyond 2019, coalition partners (e.g. NUWC, Raytheon, GDEB, etc.) will be asked to provide funding as needed project supplies.

The completed proposal with Budget Form requires review by the URI Budget and Financial Planning Office. If no new funds are requested, proposers shall request a Statement of No Financial Impact from the URI Budget and Financial Planning Office.

UNIVERSITY OF RHODE ISLAND
COLLEGE OF ENGINEERING

CONCENTRATION IN
NAVAL SCIENCE AND TECHNOLOGY

1. Any engineering major may declare a "Concentration in Naval Science and Technology" field of study, which will be listed on the student's academic record after graduation. Requirements may be satisfied by completing 9 credit hours as detailed below

   EGR 201 – Seminar in Naval Science and Technology, 1 credit (taken up to three times)

   Remaining credits:

   Navy-related research (BME, CHE, CVE, ELE, ISE, MCE or OCE 491/492)
   and/or
   Navy-related capstone design (BME 484/485, CHE 451/452, CVE 497/498, ELE 480/481, ISE 401/402, MCE 401/402 or OCE 495/496)

2. With prior approval, remaining credit courses may be substituted with appropriate other courses including special projects.

3. Application for the Concentration in Naval Science and Technology must be filed in the Engineering Dean's Office any time before graduation.

Name:_____ **Student ID #:**_____

Major:_____ **Intended Graduation Date:**_____

Name of Subplan: Concentration in Naval Science and Technology

Course Number	Course Title	#Credits	Grade(s)
	Total Credits:		

_____ _____
Program Coordinator Signature **Date (mm/dd/yy)**

_____ _____
Departmental Chairperson Signature **Date (mm/dd/yy)**

_____ _____
Dean's Signature **Date (mm/dd/yy)**

Program Coordinators

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THE
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THINK BIG WE DO™

BUDGET AND FINANCIAL PLANNING
Adams House, 85 Upper College Road, Kingston, RI 02881 USA p: 401.874.2509 f: 401.874.5824 uri.edu/budget

DATE: February 13, 2018

TO: Nancy F. Neff
Coordinator, Faculty Senate

FROM: Linda Barrett
Director, Budget and Financial Planning

SUBJECT: Proposal for a Concentration in Naval Science and Technology

As requested in an email from David Taggart, Professor of Mechanical Engineering in the College of Engineering, dated February 5, 2018, the Budget and Financial Planning Office has reviewed the submitted documents related to the proposal for a Concentration in Naval Science and Technology.

According to the proposal, the Concentration in Naval Science and Technology will be offered through the College of Engineering, and will provide URI students with the opportunity to consider Navy related careers, as well as the unique opportunity to work with Naval Undersea Warfare Center, Raytheon, and Electric Boat. Mr. Taggart referenced in the submission that the new proposal will lead to new opportunities for engineering undergraduates, as well as encourage students to pursue the engineering field within the Navy while increasing the regional demand for a highly specialized workforce.

The University of Rhode Island and University of Connecticut won a three (3) year $1.3 million grant from the Office of Naval Research to link the universities with local Navy stakeholders to create the *Southeast New England STEM Coalition*.

The Budget and Financial Planning Office, including communication with Enrollment Services, concurs that the request for a Concentration in Naval Science and Technology is not anticipated to have an impact on the Fund 100 unrestricted budget as it has been presented and that no new revenues are projected.

Please let us know if you require any further information.

cc: Donald DeHayes
Laura Beauvais
Raymond Wright
Cheryl Hinkson
Joanne Lawrence
Dean Libutti
Matthew Bodah
David Taggart
Colleen Robillard
John Humphrey

Office/BudgetImpactStatements/concentrationinnavalscienceandtechnology/BudgetImpactStatementLetter.draft

ACADEMIC PROGRAM BUDGET FORM

Use this form for programs that can be pursued on a full-time basis, part-time basis, or through a combination of full-time and part-time attendance. **Page 1 of 3**

Choose one: □ Full-time □ Part-time □ Combination of full- and part-time **X**

REVENUE ESTIMATES

	Year 1 2017	Year 2 20__	Year 3 20__	Year 4 20__
Tuition: In-State	$11,128	$12,002	$12,002	$12,488
Tuition: Out-State	$27,118	$28,252	$28,972	$29,402
Tuition: Regional	$19,474	$21,004	$21,004	$21,654
Mandatory fees per student	$1,756	$1,790	$1,790	$1,908
FTE # of New Students: In-State	0	0	0	0
FTE # of New Students: Out-State	0	0	0	0
# of In-State FTE students transferring in from the institution's existing programs	0	0	0	0
# of Out-State FTE students transferring in from the institution's existing programs	0	0	0	0

TUITION AND FEES	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs
First Year Students								
In-State tuition	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Out-of-State tuition	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Regional tuition								
Mandatory fees	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Second Year Students								
In-State tuition			$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Out-of-State tuition			$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Regional tuition								
Mandatory fees			$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Third Year Students								
In-State tuition					$0.00	$0.00	$0.00	$0.00
Out-of-State tuition					$0.00	$0.00	$0.00	$0.00
Regional tuition								
Mandatory fees					$0.00	$0.00	$0.00	$0.00
Fourth Year Students								
In-State tuition							$0.00	$0.00
Out-of-State tuition							$0.00	$0.00
Regional tuition								
Mandatory fees							$0.00	$0.00
Total Tuition and Fees	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
GRANTS	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
CONTRACTS	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
OTHER (Specify)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Grants, Contracts, Other	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
TOTAL	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

NOTE: All of the above figures are estimates based on projections made by the institution submitting the proposal.

ACADEMIC PROGRAM BUDGET FORM

Use this form for programs that can be pursued on a full-time basis, part-time basis, or through a combination of full-time and part-time attendance.

EXPENDITURE ESTIMATES

	Year 1 20__		Year 2 20__		Year 3 20__		Year 4 20__	
PERSONNEL SERVICES	Additional resources required for program	Expenditures from current resources	Additional resources required for program	Expenditures from current resources	Additional resources required for program	Expenditures from current resources	Additional resources required for program	Expenditures from current resources
Administrators								
Faculty								
Support Staff								
Others								
Fringe Benefits %								
Total Personnel	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
OPERATING EXPENSES								
Instructional Resources								
Other (specify)								
Total Operating Expenses	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
CAPITAL								
Facilities								
Equipment								
Other								
Total Capital	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
NET STUDENT ASSISTANCE								
Assistantships								
Fellowships								
Stipends/Scholarships								
Total Student Assistance	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
TOTAL EXPENDITURES	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

NOTE: All of the above figures are estimates based on projections made by the institution submitting the proposal.

ACADEMIC PROGRAM BUDGET FORM

Use this form for programs that can be pursued on a full-time basis, part-time basis, or through a combination of full-time and part-time attendance.

	Year 1 20__	Year 2 20__	Year 3 20__	Year 4 20__
BUDGET SUMMARY OF COMBINED EXISTING AND NEW PROGRAM				
Total Revenue	$0.00	$0.00	$0.00	$0.00
Total Expenses	$0.00	$0.00	$0.00	$0.00
Excess/Defeciency	**$0.00**	**$0.00**	**$0.00**	**$0.00**
BUDGET SUMMARY OF EXISTING PROGRAM ONLY				
Total Revenue	$0.00	$0.00	$0.00	$0.00
Total Expenses	$0.00	$0.00	$0.00	$0.00
Excess/Defeciency	**$0.00**	**$0.00**	**$0.00**	**$0.00**
BUDGET SUMMARY OF NEW PROGRAM ONLY				
Total of Newly Generated Revenue	$0.00	$0.00	$0.00	$0.00
Total of Additional Resources Required for	$0.00	$0.00	$0.00	$0.00
Excess/Deficiency	**$0.00**	**$0.00**	**$0.00**	**$0.00**

NOTE: All of the above figures are estimates based on projections made by the institution submitting the proposal.