



Proposal to the Senate Educational Policy Committee

PROPOSAL TITLE:

Revision of Curriculum Requirements for the Concentration in Energy Systems for the degree of Master of Engineering in Engineering in the College of Engineering and establishing an Online Option

SPONSOR:

Rizwan Uddin, Department Head, Nuclear, Plasma & Radiological Engineering,
rizwan@illinois.edu, 244-4944

COLLEGE CONTACT:

Harry Dankowicz, Associate Dean for Graduate, Professional and Online Programs, College of Engineering, danko@illinois.edu, 244-1231

BRIEF DESCRIPTION:

The Department of Nuclear, Plasma and Radiological Engineering (NPRE) is requesting a curriculum revision to the professionally-oriented Concentration in Energy Systems under the Master of Engineering in Engineering degree program. The proposed curriculum is outlined below and provides students with a more in-depth core requirement relative to the existing curriculum. The revised curriculum also enables students to gain depth and breadth in the field of energy systems through a more flexible elective coursework requirement than in the existing curriculum. See appendix A for details.

- 12 credit hours of core coursework.
- 16 credit hours of elective coursework to be chosen in consultation with advisor.
- 4 credit hours of professional development.
- At least 12 credit hours of 500-level coursework.

In addition to the requested curriculum revision, NPRE is requesting an online program code to be established to allow students to complete this program either on campus or online.

JUSTIFICATION:

Based on student data collected since the launch of the Concentration in Energy Systems under the Master of Engineering in Engineering and input from the Energy and Sustainability Engineering (EASE) Council, NPRE has determined that adding additional requirements of core coursework and creating greater flexibility in meeting the elective coursework requirement would strengthen the curriculum. The proposed curriculum revision achieves this outcome by adding 7 more required credit hours to the core requirement, including interdisciplinary courses in renewable energy systems and energy security, and by replacing a detailed breakdown of 24 credit hours of additional course requirements into primary and secondary field courses, topical breadth courses, and elective courses with a single requirement for 16 hours of elective courses

chosen in consultation with an advisor. As a result, a greater degree of uniformity in the necessary foundational knowledge is paired with greater flexibility in responding to individual students' interests, as well as changing industry needs.

This curriculum revision allows us to stay competitive with peer institution such as Northeastern, University of Michigan, and Columbia. Each of these institutions has a curriculum in energy systems with a set of core courses students must complete along with elective coursework. It is also consistent with curricula of other professionally-oriented Master of Engineering programs in the College of Engineering.

Lastly, this curriculum revision will allow us to offer this degree online as well as on campus, which also keeps us competitive with peer institutions. Students who enroll in the online program will have the necessary support to be successful in the program through the resources in the College of Engineering Office of Graduate, Professional, and Online Programs and through the College of Engineering's Center for Professional and Executive Training and Education.

BUDGETARY AND STAFF IMPLICATIONS:

1) Resources

a. How does the unit intend to financially support this proposal?

There will be no budgetary obligations due to this curriculum revision for the Concentration in Energy Systems. The curriculum revisions will be carried out with existing resources.

b. How will the unit create capacity or surplus to appropriately resource this program? If applicable, what functions or programs will the unit no longer support to create capacity?

There are no capacity implications with respect to the proposed changes. NPRE has worked with the Department of Agricultural and Biological Engineering (ABE) to ensure there is capacity in the one required ABE course under the core requirements. The additional core courses are currently being offered by NPRE to students in the program.

At this time, there is no additional staff or resources required to offer the online program option. NPRE will use the existing resources in the College of Engineering Office of Graduate, Professional and Online Programs to implement and provide support to the online students and faculty teaching the online courses. This office has the staffing capacity and resources to deliver of this online concentration.

c. Will the unit need to seek campus or other external resources? If so, please provide a summary of the sources and an indication of the approved support.

No campus or other external sources are needed. The resources currently provided by the NPRE department and the College of Engineering Office of Graduate, Professional and Online Programs are sufficient to support the estimated growth of the program, which is a steady state of 50 enrollments on-campus and 25 to 50 enrollments online.

- d. Please provide a letter of acknowledgment from the college that outlines the financial arrangements for the proposed program.

There are no external to the unit financial arrangements for the requested curriculum changes.

2) Resource Implications

- a. Please address the impact on faculty resources including the changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc.

There is no negative impact on faculty resources for the proposed change. The required core coursework will not have any immediate impact on the teaching load or student-faculty ratio. As the program grows, tuition funds returned from campus to the college and to the department will be used to hire additional faculty to support such growth.

- b. Please address the impact on course enrollment in other units and provide an explanation of discussions with representatives of those units. (*A letter of acknowledgment from units impacted should be included.*)

ABE is the only other unit that will have some impact on course enrollments. Please see attached letter in Appendix C that shows their support of this curriculum revision. This curriculum revision should not have any significant impact on the enrollment in other units.

- c. Please address the impact on the University Library.

These proposed change does not impact the University Library.

- d. Please address the impact on technology and space (e.g. computer use, laboratory use, equipment, etc.)

There will be no impact on technology or space.

For new degree programs only:

- 3) Briefly describe how this program will support the University's mission, focus, and/or current priorities. Include specific objectives and measurable outcomes that demonstrate the program's consistency with and centrality to that mission.

N/A

- 4) Please provide an analysis of the market demand for this degree program. What market indicators are driving this proposal? What type of employment outlook should these graduates expect? What resources will be provided to assist students with job placement?

N/A

- 5) If this is a proposed graduate program, please discuss the programs intended use of waivers. If the program is dependent on waivers, how will the unit compensate for lost tuition revenue?

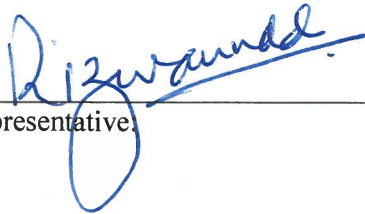
N/A

DESIRED EFFECTIVE DATE: Fall 2019 or when approved

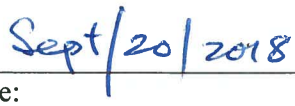
STATEMENT FOR PROGRAMS OF STUDY CATALOG: See Appendix B

CLEARANCES: (Clearances should include signatures and dates of approval. **These signatures must appear on a separate sheet.** If multiple departments or colleges are sponsoring the proposal, please add the appropriate signature lines below.)

Signatures:



Unit Representative



Date:

College Representative:

Date:

Graduate College Representative:

Date:

Council on Teacher Education Representative:

Date:

Appendix A: Proposed Curriculum Revision

Current Requirements

ENG 471 & ENG 571	Seminar Energy & Sustain Engrg and Theory Energy & Sustain Engrg	4
Professional Development (One of three options)		4
1. Practicum: ENG 572 as approved by an advisor		
2. Project: ENG 573 as approved by an advisor		
3. 4 credit hours of course work approved by an advisor from the Topical Breadth list or other advisor approved course meeting the requirements for Professional Development.		
Primary Field courses from an approved list		12
Secondary Field courses from an approved list		6
Topical Breadth course from approved list		3
Electives courses – chosen in consultation with an advisor		3
Total Hours		32

Other Requirements and Conditions (may overlap):

Requirement	
ENG 572 or ENG 573 may be taken for variable credit up to a maximum of 8 credit hours subject to advisor approval. Additional credit hours exceeding the 4 credit hour requirement may be applied toward the Primary Field course work requirement or the Elective course work requirement.	
A minimum of 16 500-level credit hours applied toward the concentration, 8 of which must be in ENG or courses in the primary field	
A maximum of one 1-credit-hour course may be applied toward the minimum 16 500-level credit-hour requirement.	
Minimum GPA:	3.0

Proposed Revised Requirements

Core Courses <ul style="list-style-type: none"> • ENG 471: Seminar Energy & Sustainability Engineering (1 credit hour) • ENG 571: Theory Energy & Sustainability Engineering (4 credit hours) • ABE 436: Renewable Energy Systems (4 credit hours) • NPRE 480: Energy and Security or NPRE 481: Writing on Technology and Security (3 credit hours) 	12
Electives (approved by academic advisor)	16

Professional Development courses from an approved list	4
Total Hours	32

Other Requirements and Conditions (may overlap):

Requirement	
A minimum of 20 credit hours must be taken from the University of Illinois Urbana-Champaign campus.	
A minimum of 12 500-level credit hours, with a minimum of 8 hours of ENG or NPRE 500-level coursework.	
A maximum of one 1-credit-hour course may be applied toward the minimum 12 500-level credit-hour requirement.	
No courses used to fulfill any degree requirement may be taken using the “Credit/No Credit” option.	
Minimum GPA:	3.0

Professional Development (4 credit hours)

Students must choose one of the following three options to complete the professional development requirement.

- ENG 572: Energy Systems Practicum (4 credit hours)
- ENG 573: Energy Systems Project (4 credit hours)
- Select a different course with professional development components in consultation with advisor

Appendix B: Program of Study

College of Engineering

<http://engineering.illinois.edu/academics/graduate/>

Harry Dankowicz
Associate Dean for Graduate, Professional, and Online Programs
400 Engineering Hall
1308 West Green Street
Urbana, Illinois 61801
217-244-1231
E-mail: danko@illinois.edu

Major: Engineering

Degrees Offered: Master of Engineering

Graduate Concentration: Energy Systems

Graduate Degree Programs

The College of Engineering offers a professionally-oriented Master of Engineering (MEng) degree program for students whose primary intent is a career in industry or government. This degree differs from the Master of Science degree in that it is a terminal degree and not a pathway to a doctoral program. The major in Engineering for the MEng degree requires the selection of an interdisciplinary concentration.

Admission

Students with bachelor's or master's degrees in engineering or related fields will be considered for admission if they have a grade point average of at least 3.00 (A = 4.00) for the last two years of undergraduate study. Admission is possible for the spring term, but most admissions are for the fall term. Full details of admission requirements are on the web page of the department offering the concentration.

All applicants whose native language is not English must submit a minimum [TOEFL](#) score of 103 (iBT), 257 (CBT), or 613 (PBT); or minimum [International English Language Testing System \(IELTS\)](#) academic exam scores of 7.0 overall and 6.0 in all subsections. Applicants may be exempt from the TOEFL if [certain criteria](#) are met. [Full admission status](#) is granted for those meeting the minimum requirements and having taken the TOEFL or IELTS, since the scores required for admission to M.Eng. are above the minimum scores demonstrating an acceptable level of English language proficiency.

Master of Engineering in Engineering with a Concentration in Energy Systems

Degree Requirements

Core Courses <ul style="list-style-type: none"> • ENG 471: Seminar Energy & Sustainability Engineering (1 credit hour) • ENG 571: Theory Energy & Sustainability Engineering (4 credit hours) • ABE 436: Renewable Energy Systems (4 credit hours) • NPRE 480: Energy and Security or NPRE 481: Writing on Technology and Security (3 credit hours) 	12
Electives (approved by academic advisor)	16
Professional Development courses from an approved list	4
Total Hours	32

Other Requirements and Conditions (may overlap):

Requirement	
A minimum of 20 credit hours must be taken from the University of Illinois Urbana-Champaign campus.	
A minimum of 12 500-level credit hours, with a minimum of 8 hours of ENG or NPRE 500-level coursework.	
A maximum of one 1-credit-hour course may be applied toward the minimum 12 500-level credit-hour requirement.	
No courses used to fulfill any degree requirement may be taken using the “Credit/No Credit” option.	
Minimum GPA:	3.0

* For additional details and requirements, please refer to the web page of the degree’s home unit and the Graduate College Handbook.

Appendix C: Support Letter

Department of Agricultural and Biological Engineering

From: Hansen, Alan Christopher
Sent: Thursday, September 20, 2018 7:27 AM
To: Uddin, Rizwan **Cc:** Allain, Jean Paul; McCullough, Amy Jeanne; Russell, Barbara J; Sullivan, Ronda Lynn; Price, Jamie H; Crump, Heather Michelle
Subject: RE: ABE 436 Renewable Energy Systems and MEng in Energy Systems

Dear Rizwan:

Thank you for contacting me about this exciting development.

As mentioned in our chat, the ABE department is in full support of ABE 436 being specified as a required course for the core curriculum of the MEng in Energy Systems. I checked with Xinlei yesterday after our chat and he confirmed his support of this proposal.

If needed I would be happy to prepare a more formal response.

Thank you for this inclusion in the MEng in Energy Systems curriculum.

Regards,
Alan Hansen

Professor and Interim Head
Director, Appropriate Scale Mechanization consortium
Department of Agricultural and Biological Engineering
University of Illinois at Urbana-Champaign
<http://abe.illinois.edu/directory/achansen>
Ph: 217-333-2969

From: Uddin, Rizwan
Sent: Wednesday, September 19, 2018 8:25 PM
To: Hansen, Alan Christopher <achansen@illinois.edu>
Cc: Allain, Jean Paul <allain@illinois.edu>; McCullough, Amy Jeanne <amccul2@illinois.edu>; Russell, Barbara J <bjrussel@illinois.edu>
Subject: ABE 436 Renewable Energy Systems and MEng in Energy Systems

Dear Alan,

Thanks for finding the time to chat with me earlier today.

As I mentioned, we are now proposing a modified curriculum for the MEng degree in Energy Systems. Based on suitability of the Renewable Energy Systems (ABE 436) class for this degree, we are proposing to make it a part of the core (required) curriculum for the MEng in Energy Systems degree. This has been approved by the EaSE council that oversees the curriculum of the MEng degree. Xinlei, at the EaSE meeting, was very supportive of the proposal.

I am attaching the curriculum page where ABE 436 is mentioned as part of the core--in case you want to see the full curriculum.

As I mentioned, we need your approval to include ABE 436 as part of the core curriculum. An affirmative reply to this email should suffice. (If we need something more formal, we will get back to you.)

With regards and thanks
Rizwan

ps. As we discussed, when this becomes a required course and as the number of students in the program grow, we should discuss how to share the burden of offering the class.

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

University Library

Office of University Librarian and Dean of Libraries
230 Main Library, MC-522
1408 West Gregory Drive
Urbana, IL 61801



November 15, 2018

Rhonda McElroy
Director of Graduate and Professional Programs
College of Engineering @ ILLINOIS
Engineering Hall 405
1308 West Green Street
Urbana, IL 61801

Dear Rhonda:

Thank you for providing the University Library with the opportunity to review the College of Engineering's proposal to the Senate Committee on Educational Policy to revise the curriculum requirements for the Concentration in Energy Systems for the degree of Master of Engineering in Engineering in the College of Engineering and establishing an Online Option. Based upon the proposal that we reviewed, we do not believe that there will be any substantive impact on existing library offerings—either in terms of library materials or personnel.

The librarians in the Grainger Engineering Library have an excellent relationship with the College and if additional services or materials are required as the program develops, I have every confidence that we will be able to work together to meet the needs of the students.

Sincerely,

A handwritten signature in black ink, appearing to read 'John P. Wilkin', written over a large, stylized initial 'J'.

John P. Wilkin
Juanita J. and Robert E. Simpson
Dean of Libraries and University Librarian

c: Bill Mischo
Thomas Teper



COLLEGE OF ENGINEERING

Office of Graduate, Professional & Online Programs
401 Engineering Hall, MC-266
1308 W. Green St.
Urbana, IL 61801 USA

September 20, 2018

Henrique Reis, Vice Chair
Executive Committee
College of Engineering

Dear Professor Reis:

My office has worked with NPRE on the curriculum revision proposal for the Concentration in Energy Systems, which is a concentration attached to the Master of Engineering in Engineering degree.

The proposed curriculum changes add:

- 7 more required credit hours to the core requirement to include interdisciplinary courses in energy systems and energy security.
- Replaces the detailed breakdown of 24 credit hours of additional course requirements (primary and secondary coursework, plus topical breath coursework) with a single requirement of 16 hours of elective coursework chosen in consultation with an advisor.

These two main curriculum changes gives the concentration a greater degree of uniformity in the necessary foundational knowledge with a greater flexibility to respond to individual students' interests as well as changing industry needs.

We now submit it for consideration by the Executive Committee.

Sincerely,

A handwritten signature in black ink that reads 'Harry Dankowicz'. The signature is fluid and cursive, with a long horizontal flourish at the end.

Harry Dankowicz
Associate Dean
Office of Graduate, Professional and Online Programs



Senate Educational Policy Committee Proposal Check Sheet

PROPOSAL TITLE (Same as on proposal): Revision of Curriculum Requirements for the Concentration in Energy Systems for the degree of Master of Engineering in Engineering in the College of Engineering and establishing an Online Option

PROPOSAL TYPE (select all that apply below):

A. Proposal for a NEW or REVISED degree program. Please consult the Programs of Study Catalog for official titles of existing degree programs.

1. Degree program level:

Graduate Professional Undergraduate

2. Proposal for a new **degree** (e.g. B.S., M.A. or Ph.D.):

Degree name, "e.g., *Bachelor of Arts or Master of Science*": _____

3. Proposal for a new or revised **major, concentration, or minor**:

New or Revised **Major** in (name of existing or proposed major): _____

New or Revised **Concentration** in (name of existing or proposed concentration):

Concentration in Energy Systems

New or Revised **Minor** in (name of existing or proposed minor): _____

4. Proposal to rename an existing major, concentration, or minor:

Major Concentration Minor

Current name: _____

Proposed new name: _____

5. Proposal to terminate an existing degree, major, concentration, or minor:

Degree Major Concentration Minor

Name of existing degree, major, or concentration: _____

6. Proposal involving a multi-institutional degree:

New Revision Termination

Name of existing Illinois (UIUC) degree: _____

Name of non-Illinois partnering institution: _____

Location of non-Illinois partnering institution:

State of Illinois US State: _____ Foreign country: _____

B. Proposal to create a new academic unit (college, school, department, program or other academic unit):

Name of proposed new unit: _____

C. Proposal to rename an existing academic unit (college, school, department, or other academic unit):

Current name of unit: _____

Proposed new name of unit: _____

D. Proposal to reorganize existing units (colleges, schools, departments, or program):

1. Proposal to change the status of an existing and approved unit (e.g. change from a program to department)

Name of current unit including status: _____

2. Proposal to transfer an existing unit:

Current unit's name and home: _____

Proposed new home for the unit: _____

3. Proposal to merge two or more existing units (e.g., merge department A with department B):

Name and college of unit one to be merged: _____

Name and college of unit two to be merged: _____

Proposed name and college of new (merged) unit: _____

4. Proposal to terminate an existing unit:

Current unit's name and status: _____

E. **Other educational policy proposals** (e.g., academic calendar, grading policies, etc.)

Nature of the proposal: _____