

# 10KS5183PHD: NUCLEAR, PLASMA, AND RADIOLOGICAL ENGINEERING, PHD

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## In Workflow

1. U Program Review (dforgacs@illinois.edu; eastuby@illinois.edu; aledward@illinois.edu)
2. 1973 Head (rizwan@illinois.edu)
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11. Board of Trustees (none)
12. IBHE (none)
13. DMI (eastuby@illinois.edu; aledward@illinois.edu; dforgacs@illinois.edu)

## Approval Path

1. Thu, 27 Feb 2020 16:37:53 GMT  
Kathy Martensen (kmartens): Approved for U Program Review
2. Thu, 27 Feb 2020 17:43:27 GMT  
Rizwan Uddin (rizwan): Approved for 1973 Head
3. Thu, 27 Feb 2020 17:57:54 GMT  
Harry Dankowicz (danko): Approved for KP Committee Chair
4. Thu, 27 Feb 2020 18:30:09 GMT  
Candy Deaville (candyd): Approved for KP Dean
5. Fri, 28 Feb 2020 00:13:46 GMT  
John Wilkin (jpwilkin): Approved for University Librarian
6. Thu, 05 Mar 2020 21:41:33 GMT  
Allison McKinney (agrindly): Approved for Grad\_College
7. Fri, 06 Mar 2020 01:35:05 GMT  
Kathy Martensen (kmartens): Approved for Provost

## History

1. Jul 1, 2019 by Mary Lowry (lowry)

Date Submitted: Thu, 27 Feb 2020 15:27:47 GMT

## Viewing: 10KS5183PHD : Nuclear, Plasma, and Radiological Engineering, PhD

Changes proposed by: Harry Dankowicz

## Proposal Type

### Proposal Type:

Major (ex. Special Education)

### This proposal is for a:

Revision

Proposal Title:

**if this proposal is one piece of a multi-element change please include the other impacted programs here. *example: A BS revision with multiple concentration revisions***

Revision of Curriculum Requirements for the PhD in Nuclear, Plasma, and Radiological Engineering to add a 96-Credit Hour Option, Department of Nuclear, Plasma & Radiological Engineering (NPRES), The Grainger College of Engineering

**EP Control Number**

EP.20.143

**Official Program Name**

Nuclear, Plasma, and Radiological Engineering, PhD

**Effective Catalog Term**

Fall 2020

**Sponsor College**

Grainger College of Engineering

**Sponsor Department**

Nuclear, Plasma & Rad Engr

**Sponsor Name**

Rizwan Uddin

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**College Contact**

Harry Dankowicz, Associate Dean for Graduate, Professional and Online Programs

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## **Program Description and Justification**

**Justification for proposal change:**

NPRES would like to add a 96-credit hour option to the current 64-credit hour PhD curriculum in Nuclear, Plasma, and Radiological Engineering to allow students to be directly admitted into the PhD program without first obtaining an approved Master's degree. With the existing curriculum, students admitted without an approved Master's degree must first complete the Master's degree in NPRES before entering the PhD program.

Under the 96-credit hour curriculum, termed the Direct PhD, students will complete requirements that combine the requirements for the current MS in NPRE and the 64-credit hour curriculum in the case of students who choose to complete an MS thesis on their way to the PhD (this will be encouraged), and that substitute 8 credit hours of graduate level coursework for thesis research in the case of students who choose not to complete an MS thesis on their way to the PhD. The degree requirements are outlined in detail in the attached Appendix A.

Student who wish to complete an MS thesis will be able to obtain an MS degree along the way to the PhD.

Under the current curriculum, students without an approved MS degree must first be admitted into the thesis-based MS degree program in NPRE and then petition into the PhD degree program. This is hindering NPRE from recruiting top talent into its graduate program. Many students applying to the NPRE PhD degree program want to be directly admitted into the PhD program without the requirement of first completing an MS degree. Almost all our peer doctoral programs have an option to directly admit students to the PhD program without requiring a prior MS degree. Examples include: University of California Berkeley, Massachusetts Institute of Technology, University of Wisconsin, Georgia Institute of Technology, Purdue University, and University of Michigan. This difference places Illinois at a distinct competitive disadvantage when recruiting top applicants who intend to pursue a PhD degree. Implementing the Direct PhD option keeps us competitive with our peers.

### **Corresponding Degree**

PhD Doctor of Philosophy

### **Is this program interdisciplinary?**

No

### **Academic Level**

Graduate

### **Will you admit to the concentration directly?**

No

### **Is a concentration required for graduation?**

No

### **CIP Code**

142301 - Nuclear Engineering.

### **Is This a Teacher Certification Program?**

No

### **Will specialized accreditation be sought for this program?**

No

## **Admission Requirements**

### **Desired Effective Admissions Term**

Fall 2020

**Is this revision a change to the admission status of the program?**

No

**Provide a brief narrative description of the admission requirements for this program. Where relevant, include information about licensure requirements, student background checks, GRE and TOEFL scores, and admission requirements for transfer students.**

Admission to the NPPE Direct PhD program will require applicants to have a bachelor's degree in engineering or in a stem field from an accredited institution whose requirements for the bachelor's degree are substantially equivalent to those of the University of Illinois. Applicants must hold at least a 3.0 or higher GPA to be considered for admission. In addition, the Graduate Record Examination (GRE) is required.

**Describe how critical academic functions such as admissions and student advising are managed.**

With a recent increase in the number of faculty members and the need to further increase the absolute number as well as the number of PhD students per faculty, this program is in line with the goals of the department and the college. To help with the expected increase in the number of graduate students in the department, NPPE is adding a person to its academic programs office.

## **Enrollment**

**Describe how this revision will impact enrollment and degrees awarded.**

The enrollment in the NPPE master's degree may decrease some. NPPE will admit students who wish to earn their PhD into the Direct PhD curriculum instead of the master's degree. In addition, this change may effect the number of master's degrees awarded. Students in the Direct PhD curriculum will have the option to earn a master's degree along the way, but not all will choose to do so.

**Estimated Annual Number of Degrees Awarded**

**What is the matriculation term for this program?**

Fall

## **Delivery Method**

**Is this program available on campus and online?**

No

**This program is available:**

On Campus

## **Budget**

**Are there budgetary implications for this revision?**

No

**Will the program or revision require staffing (faculty, advisors, etc.) beyond what is currently available?**

No

#### **Additional Budget Information**

There will not be any budgetary obligations due to these changes to the NPRE PhD curriculum. The program implementations will be carried out with existing resources.

### **Resource Implications**

Facilities

**Will the program require new or additional facilities or significant improvements to already existing facilities?**

No

Technology

**Will the program need additional technology beyond what is currently available for the unit?**

No

Non-Technical Resources

**Will the program require additional supplies, services or equipment (non-technical)?**

No

### **Resources**

Faculty Resources

**Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.**

There are no negative implications on faculty resources for either of the proposed changes.

Library Resources

**Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.**

This proposed change will not impact the University Library.

## Instructional Resources

**Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?**

No

**Does this new program/proposed change result in the replacement of another program?**

No

**Does the program include other courses/subjects impacted by the creation/revision of this program?**

No

## Financial Resources

**How does the unit intend to financially support this proposal?**

There will not be any budgetary obligations due to these changes to the NPRE PhD curriculum. The program implementations will be carried out with existing resources.

**Will the unit need to seek campus or other external resources?**

No

**Will an existing tuition rate be used or continue to be used for this program?**

Yes

**Is this program requesting self-supporting status?**

No

## Program Regulation and Assessment

**Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning. (Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable).**

The proposed revision combines two existing curricula into a single Direct PhD curriculum, with no changes to learning objectives or methods/metrics of assessing student success and achievements.

**Is the career/profession for graduates of this program regulated by the State of Illinois?**

No

## Program of Study

"Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses" (source: <https://www.ibhe.org/assets/files/PrivateAdminRules2017.pdf>). For proposals for new bachelor's degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide information on how the upper-division hours requirement will be satisfied.

**All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.**

### Revised programs

Appendix A-NPRE\_PhDCurriculumChanges v6.pdf

**Attach a side-by-side comparison with the existing program AND, if the revision references or adds "chosed-from" lists of courses students can select from to fulfill requirements, a listing of these courses, including the course rubric, number, title, and number of credit hours.**

Catalog Page Text

**Catalog Page Text: Description of program for the catalog page. This is not official content, it is used to help build the catalog pages for the program. Can be edited in the catalog by the college or department.**

The doctoral candidate must complete course work, pass a qualifying examination, a preliminary doctoral examination, write a doctoral thesis, and successfully defend the thesis at a final examination before a doctoral faculty committee. A doctoral student typically takes several courses in NPPE plus additional courses that support a specialized research area and provide background in mathematics and science. Under exceptional circumstances and by approved petition, doctoral research may be undertaken off campus.

For additional details and requirements refer to the department's printed handbook and the Graduate College Handbook.

### Statement for Programs of Study Catalog

## Entering with an approved Master's Degree:

Code	Title	Hours
NPPE 599	Thesis Research (min-max applied toward degree)	40
NPPE 501 & NPPE 521	Fundamentals of Nuclear Engrg and Interact of Radiation w/Matter(if not taken while completing the M.S. degree)	0-8
NPPE 596	Seminar in Nuclear Sci & Engrg (registration for 1 hour every semester while in residence; credit does not apply toward the degree.)	0
Elective Courses (subject to Other Requirements and Conditions below)		16
8 hours of 500-level courses (not including NPPE 501 and NPPE 521)		
4-8 hours of NPPE graduate level courses, not counting 402, 446, 501, 521, 596, or 599		
Total Hours		64

## Other Requirements and Conditions

Requirement	Description
Other Requirements and Conditions may overlap	
Consult department for details of minimum hours required within the unit.	
Credit in NPPE 402 or NPPE 446 does not count toward the degree.	
A Master's degree or equivalent is required for admission to the Ph.D. program.	
Ph.D. exam and dissertation requirements:	

Qualifying exam:	
Preliminary exam	
Final exam or dissertation defense	
Dissertation deposit	
Minimum GPA:	3.0

### Entering with an approved Baccalaureate Degree:

Code	Title	Hours
NPRE 599	Thesis Research (min-max applied toward degree)	40-48
NPRE 501 & NPRE 521	Fundamentals of Nuclear Engrg and Interact of Radiation w/Matter	8
NPRE 596	Seminar in Nuclear Sci & Engrg (registration for 1 hour every semester while in residence; credit does not apply toward the degree. )	0
Elective Courses (subject to Other Requirements and Conditions below)		40-48
16 hours of 500-level courses (not including NPRE 501 and NPRE 521)		
12-16 hours of NPRE graduate level courses, not counting 402, 446, 501, 521, 596, or 599		
Total Hours		96

### Other Requirements and Conditions

Requirement	Description
Other Requirements and Conditions may overlap	
Consult department for details of minimum hours required within the unit.	
Credit in NPRE 402 or NPRE 446 does not count toward the degree.	
Students not completing an MS thesis may only count 40 credit hours of NPRE 599.	
Ph.D. exam and dissertation requirements:	
Qualifying exam:	
Preliminary exam	
Final exam or dissertation defense	
Dissertation deposit	
Minimum GPA:	3.0

### EP Documentation

### DMI Documentation

#### Banner/Codebook Name

PHD: Nucl, Plasma, Rad Eng-UIUC

#### Program Code:

10KS5183PHD

#### Degree Code

PHD

#### Major Code

5183



#### **Program Reviewer Comments**

**Harry Dankowicz (danko) (Tue, 25 Feb 2020 19:25:54 GMT):**Rollback: This was approved today by the GCOE EC with the provision that the 96-hour curriculum "other conditions" stipulate that a master's degree is \*not\* required for admission.

**Harry Dankowicz (danko) (Thu, 27 Feb 2020 15:21:47 GMT):**Rollback: Fix error in catalog entry

Key: 400

## Appendix A:

### NPRE 64-Credit Hour Curriculum and New 96-Credit Hour Option

#### Current 64 Credit Hour Ph.D. Curriculum

Code	Title	Hours
<a href="#">NPRE 599</a>	Thesis Research (min-max applied toward degree)	40
<a href="#">NPRE 501</a> & <a href="#">NPRE 521</a>	Fundamentals of Nuclear Engrg and Interact of Radiation w/Matter (if not taken while completing the M.S. degree)	0-8
<a href="#">NPRE 596</a>	Seminar in Nuclear Sci & Engrg (registration for 1 hour every semester while in residence; credit does not apply toward the degree. )	0
Elective Courses (subject to Other Requirements and Conditions below)		16-24
8 hours of 500-level courses		
4-8 hours of NPRE graduate level courses, not counting 402, 446, 501, 521, 596, or 599		
<b>Total Hours</b>		<b>64</b>

#### Other Requirements

<b>Requirement</b>
Other Requirements and Conditions may overlap
Consult department for details of minimum hours required within the unit.
Credit in <a href="#">NPRE 402</a> or <a href="#">NPRE 446</a> does not count toward the degree.
A Master's degree is required for admission to the Ph.D. program.
Ph.D. exam and dissertation requirements:
Qualifying exam
Preliminary exam
Final exam or dissertation defense
Dissertation deposit
The minimum program GPA is 2.75.

## Revised 64 Credit Hour Ph.D. Curriculum

Code	Title	Hours
<u>NPRE 599</u>	Thesis Research (min-max applied toward degree)	40
<u>NPRE 501</u> & <u>NPRE 521</u>	Fundamentals of Nuclear Engrg and Interact of Radiation w/Matter (if not taken while completing the M.S. degree)	0-8
<u>NPRE 596</u>	Seminar in Nuclear Sci & Engrg (registration for 1 hour every semester while in residence; credit does not apply toward the degree. )	0
Elective Courses (subject to Other Requirements and Conditions below)		16-24
8 hours of 500-level courses (not including NPRE 501 and NPRE 521)		
4-8 hours of NPRE graduate level courses, not counting 402, 446, 501, 521, 596, or 599		
<b>Total Hours</b>		<b>64</b>

### Other Requirements

Requirement
Other Requirements and Conditions may overlap
Consult department for details of minimum hours required within the unit.
Credit in <a href="#">NPRE 402</a> or <a href="#">NPRE 446</a> does not count toward the degree.
A Master's degree is required for admission to the Ph.D. program.
Ph.D. exam and dissertation requirements:
Qualifying exam
Preliminary exam
Final exam or dissertation defense
Dissertation deposit
The minimum program GPA is 3.0.

## New 96 Credit Hour (Direct) Ph.D. Option

Code	Title	Hours
<u>NPRE 599</u>	Thesis Research (min-max applied toward degree)	40-48
<u>NPRE 501</u> & <u>NPRE 521</u>	Fundamentals of Nuclear Engrg and Interact of Radiation w/Matter	8
<u>NPRE 596</u>	Seminar in Nuclear Sci & Engrg (registration for 1 hour every semester while in residence; credit does not apply toward the degree. )	0
Elective Courses (subject to Other Requirements and Conditions below)		40-48
16 hours of 500-level courses (not including NPRE 501 and NPRE 521)		
12-16 hours of NPRE graduate level courses, not counting 402, 446, 501, 521, 596, or 599		
<b>Total Hours</b>		<b>96</b>

### Other Requirements

Requirement
Other Requirements and Conditions may overlap
Consult department for details of minimum hours required within the unit.
Credit in <a href="#">NPRE 402</a> or <a href="#">NPRE 446</a> does not count toward the degree.
Students not completing an MS thesis may only count 40 credit hours of <a href="#">NPRE 599</a> .
Ph.D. exam and dissertation requirements:
Qualifying exam
Preliminary exam
Final exam or dissertation defense
Dissertation deposit
The minimum program GPA is 3.0.

### Overview of Both Curricula Side-by-Side

<b>Ph.D. Degree</b>	<b>Entering with approved MS Degree</b> (64-credit hour curriculum)	<b>Entering with BS Degree</b> (96-credit hour option)
Total credit towards degree	64 hours	96 hours
NPRE 599 Research (minimum applied toward degree)	40	40-48
Coursework Hours	24	48-56

Students in the direct Ph.D. path who do not complete an M.S. thesis can only count 40 credit hours of NPRE 599 toward their degree and will be required to take eight additional credit hours of course work compared to those who complete a M.S. thesis. (NPRE requirements for M.S. degree include: 24-28 credit hours of course work, and 4-8 credit hours of NPRE 599 research.)