College of Engineering
Proposed Catalog Changes
Effective Summer 2020

PROPOSAL TO CREATE A NEW GRADUATE CERTIFICATE IN NUCLEAR DECOMMISSIONING AND USED FUEL MANAGEMENT

1. Create the following Graduate Certificate:

Nuclear Decommissioning and Used Fuel Management Academic Certificate

Before pursuing this certificate, students must have completed NE 450 (Principles of Nuclear Engineering) or have previous professional nuclear experience (e.g., nuclear navy, commercial power plant).

NE 516	Nuclear Rules and Regulations	3
NE 554	Radiation Detection and Shielding	3
NE 582	Spent Nuclear Fuel Management and Disposition	3
NE 587	Nuclear Decommissioning	3
Total Hours		12

Courses to total 12 credits for this certificate

Distance Availability: Yes
Rationale: The nuclear industry is facing financial challenges from low prices for electricity as a result of cheap natural gas as well as a glut of growing renewable sources. As a result, it is projected that a full quarter of the current U.S. nuclear generation capacity will be retired and require decommissioning by 2050. These decommission activities will require trained engineers with a skill set and knowledge base beyond those needed for projected construction of the new plants (conventional, small modular, and microreactors) during the same time period. UI will develop this expertise through the Nuclear Decommissioning and Used Fuel Management (NDUFM) certificate. The four course, 12 credit graduate-level certificate will be structured to educate currently employed practicing engineers desiring to expand their skill sets as well as traditional graduate students in pursuit of M.S., M.Engr., and Ph.D. credentials for the emerging and important decommissioning field. The NDUFM certificate program of instruction will provide world-class engineering education using state of the art pedagogy specifically crafted for worldwide asynchronous delivery. This will be accomplished by the collaboration between nuclear engineering faculty members and experts in asynchronous pedagogy and delivery to produce reusable learning modules with high quality production value. The certificate would include the development of asynchronous learning materials for i) an existing prerequisite “leveling course,” ii) three existing courses and iii) one new course, NE 587.

University of Idaho
Office of the Provost and
Executive Vice President

PROGRAM COMPONENT (Group B) OR NON-SUBSTANTIVE REQUEST FORM

(Fill out this form if you have a program component change as defined by Board Policy III.G.d.)

SELECT THE BOX OR BOXES THAT DESCRIBE YOUR REQUEST:

[ ]	1. New component (option, minor, emphasis, concentration or specialization)	[ ]	5. Discontinuation of a certificate (30 credits or less)
[X]	2. New certificate (30 credits or less)	[ ]	6. CIP Code change
[ ]	3. Change to program name or title, degree, department, division, college or center	[ ]	7. Other, please describe:
[ ]	4. Discontinuation of a component (option, minor, emphasis, concentration or specialization)		

REQUIRED INFORMATION FOR ALL SELECTIONS:

Dept Chair Name:	Richard Christensen		Email:	rchristensen@uidaho.edu	
Department/Unit:	Nuclear Engineering				
College:	Engineering				
Current Program Name:	NEW	X	Graduate		
			Undergraduate		
Current program credits:					
Primary Point of Contact (if different from above):	Robert Borrelli		Email:	rborrelli@uidaho.edu	
Briefly describe the change you are requesting:	Create a 12 credit Graduate Certificate in Nuclear Decommissioning and Used Fuel Management				
CIP Code:		New (list requested code): 14.2301			Existing (list the current code):
What is the financial impact of the requested change:		Greater than $250,000 per FY;	X		Less than $250,000 per FY;
Describe the financial impact:	The financial impact will be minimal. The certificate program will involve the creation of one new course, The resources associated with program delivery will be provided by the Idaho Falls Center in conjunction with the Idaho National Laboratory (INL) education contract.				

Implementation/effective date of change or new component:	Fall 2020			
Can 50% or more of the curricular requirements of this program be completed via online or distance delivery?	X	Yes		No
If yes can 100% of the curricular requirements of this program be completed via online or distance delivery?	X	Yes		No
Please write the geographical location that this program will be offered:				

NEW PROGRAM COMPONENTS AND CERTIFICATES – FILL OUT THIS SECTION IF YOU SELECTED #1 OR #2 ABOVE

Name of new component or certificate:	Nuclear Decommissioning and Used Fuel Management Certificate
Number of credits:	12
Describe proposed new program component or certificate to include overview of program and credit requirements:	The nuclear industry is facing financial challenges from low prices for electricity as a result of cheap natural gas as well as a glut of growing renewable sources. As a result, it is projected that a full quarter of the current U.S. nuclear generation capacity will be retired and require decommissioning by 2050. These decommission activities will require trained engineers with a skill set and knowledge base beyond those needed for projected construction of the new plants (conventional, small modular, and microreactors) during the same time period. UI will develop this expertise through the Nuclear Decommissioning and Used Fuel Management (NDUFM) certificate. The four course, 12 credit graduate-level certificate will be structured to educate currently employed practicing engineers desiring to expand their skill sets as well as traditional graduate students in pursuit of M.S., M.Engr., and Ph.D. credentials for the emerging and important decommissioning field. The NDUFM certificate program of instruction will provide world-class engineering education using state of the art pedagogy specifically crafted for worldwide asynchronous delivery. This will be accomplished by the collaboration between nuclear engineering faculty members and experts in asynchronous pedagogy and delivery to produce reusable learning modules with high quality production value. The certificate would include the development of asynchronous learning materials for i) an existing prerequisite "leveling course," ii) three existing courses and iii) on new courses as described below: **Prerequisite**: • NE 450 Principles of Nuclear Engineering – Basic nuclear and atomic processes; radioactive decay, binding energy, radiation interactions, reaction cross sections. Neutron diffusion, radiation sources. *OR*

	• Previous professional nuclear experience (e.g., nuclear navy, commercial power plant, etc.) **NDUFM Certificate**: • NE 516 Nuclear Rules and Regulations – An in-depth examination of nuclear regulatory agencies; major nuclear legislation; current radiation protection standards and organizational responsibility for their implementation. • NE 554 Radiation Detection and Shielding – Radiation transport and shielding concepts. Methods for quantifying attenuation of nuclear particles and electromagnetic radiation. Radiation detection methods, data acquisition and processing. • NE 582 Spent Nuclear Fuel Management and Disposition – The management of nuclear fuel after removal from a nuclear reactor; storage options, recycle and recovery of uranium and other radionuclides, geological repositories and related topics. • *NE 587* (new) Nuclear Decommissioning – Concepts and strategies for decommissioning nuclear facilities including project and program management, waste management, and site environmental restorations. Currently, there are no programs in the U.S. specifically focused on decommissioning with the exception of a specialized University of Tennessee program associated with the Oak Ridge National Laboratory Y-12 facility. Through the Nuclear Decommissioning and Used Fuel Management certificate, UI will establish itself on the leading edge of a program that has the potential to serve the needs of the U.S. and worldwide nuclear industry for at least the next 3 decades.

Are there curriculum changes needed and/or do new courses need to be created:	X	Yes – if you select yes to this question, please attach all curriculum and course documents related to this.		No

List the intended learning outcomes for the program component. Use learner centered statements that indicate what will students know, be able to do, and value or appreciate as a result of completing the program:

Upon completion of the Nuclear Decommissioning and Used Fuel Management certificate program students will:

- Understand the regulatory framework and its basis for nuclear operations and implement this framework in the context of decommissioning of nuclear facilities and the management of associated radioactive materials.
- Understand radiation shielding and protection and its application in the decommissioning of nuclear facilities.
- Understand strategies and the engineering basis for the safe removal and short-term storage of used nuclear fuel.
- Understand the strategies and technical basis for the long-term disposition of used nuclear fuel and its relationships to short-term storage strategies.
- Understand and apply principles of project management, waste management, and site remediation to the decommissioning of nuclear facilities.

Describe the assessment process that will be used to evaluate how well students are achieving the intended learning outcomes of the program component:

Assessment of learning objective will be accomplished through student written materials, exams, and case-study projects.

How will you ensure that the assessment findings will be used to improve the program?

The program coordinator in collaboration with the Nuclear Engineering program director, participating faculty, and asynchronous pedagogy will meet and review the certificate program (including samples of student work) annually. As appropriate, this review will include experts from industry to provide state of the practice perspectives. Based on these reviews, recommendations for changes and improvements will implement into the program as part of a strategy of continuous improvement.

What direct and indirect measures will be used to assess student learning?
Direct measures include grades and performance on assignments, exams and reports. Indirect measures will include success of students in the job market, and over the long-term, the satisfaction of industry with the program (as describe above). In addition, exit assessments will be conducted with students completing the program to assess their satisfaction.
When will assessment activities occur and at what frequency?
Assessment will occur at two levels. Individual courses within the certificate program will grade assignments, exams, and report throughout the semester the course is offered. Assessment of the overall certificate program will occur annually as described above.

MODIFICATIONS/NAME CHANGES/CIP CODE CHANGES – FILL OUT THIS SECTION IF YOU SELECTED #3 OR #6 ABOVE

Current name of component or degree:				
New name of component or degree:				
Number of credits:				
Describe the modification are you making:				
Name of major or degree that the component is attached to:				
Describe rationale for the modification:				
Indicate whether program, curriculum, course and admission requirements remain the same.		Yes – if you select yes to this question, please attach all curriculum and course documents related to this.		No
Are any of the learning outcomes changing:		Yes – if yes fill out question below		No
List the new learning outcomes:	1. 2. 3. 4. 5.			

DISCONTINUATION – FILL OUT THIS SECTION IF YOU SELECTED #4 OR #5 ABOVE

What are you requesting to discontinue:				
What is the student impact if any?				
Are there curriculum changes needed and/or do new courses need to be created:		Yes – if you select yes to this question, please attach all curriculum and course documents related to this.		No

SIGNATURES – REQUIRED FOR ALL SELECTIONS:

Dept/Unit Curriculum Committee Approval Date:		Vote Record:	

Dept Chair Signature of Approval			
College Curriculum Committee Approval Date:		Vote Record:	
Dean Signature of Approval			