Doctor of Philosophy - Mechanical Engineering

2 Graduate Program Change 2022-23

I. General Information

The faculty member originating this proposal is to complete sections I and II.

Before starting this form, please review graduate curriculum website on policies and processes: https://www.unlv.edu/graduatecollege/curriculum
Click "validate and launch proposal" button below. Once the pop-up window comes up and displays an error message, click on the "show me" button (on the pop-up). This will highlight in red the required fields of this form. Fill in ONLY the red (required) fields.
With all red fields completed, click on the "validate and launch proposal" button again to launch the proposal. The pop-up this time should not display an error, and will display instead a "launch proposal" button. Click on the "launch proposal" button to launch.
After launch, please fill in all remaining fields in the form to reflect your intended changes, including edits to the schema section of this form (further explained below).

Department (s) (if Dual or Interdisciplinary please add all departments):* Mechanical Engineering

Degree or Certificate Name:* Doctor of Philosophy - Mechanical Engineering

Degree Type:* Doctor of Philosophy

Program Type:* Doctoral

II. Program Changes

Proposed New CIP Code (if applicable):

Are you changing (•) Yes ( ) No

admission requirements?*	
Are you changing program learning objectives?*	○ Yes ◉ No
If yes, describe changes to learning objectives:	
Are you changing course requirements?*	◉ Yes ○ No
Are you changing degree completion requirements?*	◉ Yes ○ No
Are you changing the culminating experience?*	○ Yes (complete the culminating experience section below) ◉ No
Other Changes (e.g. subplan titles,...):*	◉ Yes ○ No
If not a Dual itself, is this program also available as part of a Dual-Degree offering?*	○ Yes ◉ No

Summary of Changes

Provide a brief summary of proposed changes:	We propose to create a new embedded degree in our existing direct PhD subplans. After students complete 33 credits including 6 credits ME 791, they are elgible to earn a Master degree in mechanical Engineering.
Provide a rationale for each proposed change:	We have part-time PhD students in our program. Due to their work requirements, a graduate degree sometimes is required for them to get promotion or get hired. By creating this embedded degree, we can help our students' employments.

Office of Online Education

Programs that are 100% online must contact the Office of Online Education (https://www.unlv.edu/provost/online-education).

Email: elizabeth.barrie@unlv.edu

What is the current delivery/mode of instruction for this program? *	○ 100% face-to-face courses ◉ Hybrid (some online courses; some face-to-face courses) ○ 100% online courses

100% online courses

Are you changing the delivery/mode of instruction? (select new mode):*

- ○ 100% face-to-face courses
- ○ Hybrid (some online courses; some face-to-face courses)
- ○ 100% online courses (contact office of online education)
- ◉ No Changes

Required Additional Documents:

Please attach required documents by navigating to the "attach a file" icon at the right of this form.

Information and forms available at the Office of the Vice Provost for Academic Programs website.

If changing to 100% online delivery, please attach the following:

Assessment Plan - A new assessment plan will be required when adding an exclusively online mode of delivery to a degree and it must be approved by the Office of Academic Assessment, assessment@unlv.edu,
Dean's memo of support
Teach Out Plan (available at the Office of the Vice Provost for Academic Programs website).

If 100% Online, attach the required documents and mark the checkboxes:

- ○ Assessment Plan
- ○ Dean's memo of support
- ○ Teach Out Plan

Office of Educational Compliance

Programs that lead to professional licensure or certification must contact the Office of Educational Compliance (https://www.unlv.edu/provost/ed-compliance).

Email: leeann.fields@unlv.edu

With this change, does this program lead to professional licensure or certification?*

- ○ Yes (contact office of educational compliance)
- ◉ No

SCHEMA SECTION

Please edit the schema section after launching the proposal. To launch, please complete all other fields of this form and click "validate and launch" at the bottom. If an error message pops up, please click "show me" and fill in all red (missing) fields in the form and click "validate and launch" again until successfully launched.

In this section, please use the instructions below to change the graduate catalog display of program requirements: descriptions, admissions, courses, degree completion, graduation, etc.

Please note that the new graduate catalog will display the exact information that you edit in this section.

INSTRUCTIONS:

1. Click on the “View Curriculum Schema” icon at the bottom of the “Schema Section.”

2. If you are only adjusting existing content, click on the respective Core you would like to edit, then make your edits and click on "Save" as you go. If you are deleting a subplan or courses, simply delete the respective Cores or courses and adjust the descriptive content accordingly.

If you are adding new subplans and/or adding or substituting courses, please see the steps below:

Prior to following the steps below, please open in parallel a structurally similar program from the graduate catalog as a reference (UNLV Graduate Catalog). You will use this reference to review the sections of a program plan, and have direction on expected content.

3. Click “Add Core” to create blank “Cores.” Create as many Cores as you will need. If unsure, refer to other subplans already in this program or to a reference in the graduate catalog to understand how many Cores you need and their expected content.

4. Click on each Core and rename them folowing your needs or a catalog reference, clicking on “Save” as you go.

5. Add content to all of the cores by clicking within the field to be edited and clicking "Save" as you go. Please note that course sections require instructions of how the credits must be taken (e.g. "Complete x credits by completing all of the following courses," or "Complete x credits of advisor-approved courses," or "Complete 3 credits of course-x and 6 credits of course-z," etc.).

6. To add courses, click on the “View Curriculum Courses” tab at the top of the schema window below, then click on the “Import Course” button at the bottom of the “View Curriculum Courses” window. Click on the available import catalog (only one will be available), and on the import window, select “filter by prefix." (1) Search for your desired course prefix; (2) then click “search available curriculum; (3) then click on all courses that will be imported. Add courses to proposal by clicking, at the very bottom, on the “Add Courses to Proposal” button. Repeat this process as often as you need until all courses are added to the proposal.

7. For courses that do not exist yet at the time of this proposal: Add the courses into the description box of the respective course section in the following way: "PREFIX - NUMBER - Course name, (credits)."

8. Add the courses into their respective course section by clicking "add course" within each course section.

QUESTIONS? **Step-by-step guides are available at the Graduate Curriculum Website, and at any time please contact gradcurriculum@unlv.edu**

Proposed Curriculum:*

Plan Description

The Department of Mechanical Engineering offers a program leading to the Ph.D. degree in Engineering in the field of Mechanical Engineering. The program also offers the Ph.D. degree with a concentration in the field of Nuclear Engineering.

For more information about your program, including your graduate program handbook and learning outcomes, please visit the Degree Directory.

Plan Admission Requirements

Application deadlines

Applications available on the UNLV Graduate College website.

Application for the Ph.D. program can be completed by one of two mechanisms. The Post-Master's subplan requires the student to complete an M.S. degree in Engineering or equivalent with a major in mechanical engineering or closely related fields (nuclear engineering or health physics for the Nuclear concentration subplan). The Post-Bachelor's subplan allows those undergraduates with outstanding undergraduate backgrounds to enter the Ph.D. program without having to complete an M.S. degree. The degree requirements for both options are the same beyond the B.S. degree excluding the completion of a master's thesis.

In order to be admitted to the Ph.D. program in Engineering in the field of Mechanical Engineering, a student must complete the following requirements:

Applicants must complete the on-line process in the Grad Rebel Gateway system.
Mechanical Engineering applicants must provide two additional items while completing the process in the Grad Rebel Gateway system:

Submit a written statement of purpose indicating interests and objectives in working toward a Ph.D. degree. This is a 1-2 page essay describing the applicant's reasons for considering graduate study, goals after completion of the graduate degree, and the applicant's specific areas of interest.
Submit three letters of recommendation using the online recommendation system. There is no specified format. Each letter should detail the

potential of the applicant for success in a Mechanical Engineering Ph.D. program.

Candidates who do not meet all the requirements may be admitted with conditional or provisional status. Details of the conditions or provisions required will be provided with the notification of admittance.

Before acceptance into the Ph.D. program, potential students may take courses as a non-degree seeking student. Up to 15 credits can be applied to the degree program if they meet curriculum requirements.

The applicant must submit an official copy of the Graduate Record Examination (GRE) test scores. The GRE university code for UNLV is 4861. The Mechanical Engineering Department code is 1502. The preferred score is at or above 75 percentile range in the quantitative reasoning section. The Graduate Program Committee can modify this requirement if necessary. The GRE requirement is waived for students participating in the Integrated BS-PhD subplan.

All domestic and international applicants must review and follow the Graduate College Admission and Registration Requirements.

Admitted students with non-engineering backgrounds will be required to complete a set of courses that will assure successful completion of the Ph.D. specialization and qualify the student to sit for the Fundamentals of Engineering (FE) exam. The Graduate Program Committee or Graduate Coordinator will specify a list of required undergraduate courses that must be completed within the first year. These courses are in addition to those required for the graduate degree.

Post-Master's subplan

The applicant must have a Master of Science in Engineering degree or equivalent with a major in mechanical engineering or a closely allied field.

A minimum post-baccalaureate GPA of 3.30 (on a 4.00 scale) is required for graduates from accredited U.S. institutions. The Graduate College is responsible for international GPA interpretation.

Post-Bachelor's subplan

The applicant must have a bachelor's degree in engineering or a closely related discipline.

A minimum GPA of 3.50 (on a 4.00 scale) is required for graduates from accredited U.S. institutions. The Graduate College is responsible for international GPA interpretation.

Integrated BS-PhD subplan

The Integrated BS-PhD degree program is designed to provide high-achieving

UNLV Mechanical Engineering undergraduate students with the opportunity to take graduate courses that can count toward both the B.S. and Ph.D. ME

degree programs at UNLV. This will hopefully encourage them to continue with a graduate degree by reducing the time needed for degree completion. Up to nine credits of approved graduate-level course work can be taken as technical electives for the grade of B or better during the senior year and those credits will be waived for the graduate degree. The GRE requirement is waived for students participating in the Integrated BS-PhD subplan. The following conditions are needed to enroll in the Integrated BS-PhD program:

- **A minimum of two semesters of full-time enrollment in B.S. of Mechanical Engineering program is required.**
- **Applications are normally submitted with two semesters remaining in the senior year.**
- **A minimum of 90 credits of course work applicable to the B.S. of Mechanical Engineering degree with a cumulative GPA of 3.50 or higher must be completed before beginning the joint degree program.**
- **Student must submit three letters of recommendation to the Mechanical Engineering Graduate Program Coordinator.**

Students are accepted into a degree program as described in the Graduate Catalog. The faculty and corresponding sub-disciplines and sub-plans within the described programs are subject to change at any time.

Plan Requirements

See Subplan Requirements below.

Subplan 1: Post-Master's

Subplan 2: Post-Master's Nuclear Engineering

Subplan 3: Post-Bachelor's

Subplan 4: Post-Bachelor's Nuclear Engineering

Subplan 5: Integrated BS-PhD

Subplan 6: Integrated BS-PhD Nuclear Engineering

Subplan 1 Requirements: Post-Master's

Total Credits Required: 39

Course Requirements

Required Courses – Credits: 9

Complete 9 credits from any Mechanical Engineering 600- or 700-level courses.

Elective Courses – Credits: 12

Complete 12 credits of 600- or 700-level coursework from within the College of Engineering. Courses from outside the College of Engineering may be taken with advisor approval.

Dissertation – Credits: 18

ME 799 Dissertation	**1 – 6**

Degree Requirements

Complete a minimum of 21 credits of course work beyond the degree of Master of Science in Engineering (M.S.) or equivalent with an overall minimum GPA of 3.20 and a minimum GPA of 2.70 (B-) in each class. Ph.D. candidates who do not maintain this GPA requirement will be placed on probation.

Out of the 21 credits of course work a minimum of 18 of these credits must be 700-level courses, and no more than 6 credits can be from ME 791 Graduate Independent Study. In addition to these course requirements, a minimum of 18 credits of Dissertation is required.

The student's Doctoral Advisory Committee may add other requirements in accordance with the individual's background and area of study. No more than 15 non-matriculated credits including transfer credits are allowed.

The student must identify a Dissertation Advisor within the first semester of joining the program. The student, in consultation with their Advisor, will form a Doctoral Advisory Committee that

includes at least five members:

- **One Dissertation Advisor. A student may have two co-Advisors but they count as one committee member.**
- **Three Mechanical Engineering Department faculty members. At the discretion of the Dissertation Advisor and student, one of these three can be from a relevant supporting field outside of the department or university.**
- **One Graduate College representative. The student, in consultation with their Advisor, is responsible for inviting a committee member from within the university but outside the Mechanical Engineering Department. This person is responsible for ensuring consistency and fairness throughout the UNLV graduate programs.**

The program of study must be submitted by the second semester of study. The program of study is to be prepared by the student and their doctoral advisor, and must be approved by the student's Doctoral Advisory Committee and the GPC.
The student must pass a written Qualifying Exam consisting of two sections, Mathematics and a Major subject area chosen from the following list:

- **Dynamics and Control**
- **Fluid Mechanics**
- **Material Science**
- **Solid Mechanics and Mechanical Design**
- **Thermal Sciences**
- **Nuclear Engineering**

These examinations are prepared by a department committee and based on undergraduate senior level courses. Qualifying exams are held every semester. The first attempt at taking the qualifying exam must be scheduled during the first year of study. They can be taken a maximum of two times. Failure to take the exam within the first year or failure to pass the exam in the second attempt will automatically result in terminating the student from the program.

Students must submit a written report to their Doctoral Advisory Committee consisting of a relevant literature review, dissertation research objectives, and outline of planned work to meet those objectives. The student must also present this proposal to their committee and be prepared to discuss and defend their objectives and plan. This report and presentation is known as the

"Preliminary Exam".

The Preliminary Exam must be scheduled within one semester of passing the Qualifying Exam.
The Preliminary Exam can be taken only once per semester but may be repeated until passed.

The student is advanced to candidacy for the Ph.D. upon completion of all course work, the Qualifying Exam and the Preliminary Exam.

Graduation Requirements

See Plan Graduation Requirements below.

Subplan 2 Requirements: Post-Master's Nuclear Engineering

Total Credits Required: 39

Course Requirements

Required Courses – Credits: 9

Students in the Nuclear Engineering concentration must take three courses (9 credits) from the following list:

ME 655 Fundamentals of Nuclear Engineering	3
ME 700 Advanced Fluid Mechanics I	3
ME 701 Advanced Fluid Mechanics II	3
ME 702 Computational Fluid Dynamics	3
ME 705 Conduction Heat Transfer	3
ME 706 Convective Heat Transfer	3
ME 707 Radiation Heat Transfer	3
ME 708 Convective Boiling and Condensation	3
ME 711 Advanced Thermodynamics	3
ME 754 Introduction to Nuclear Criticality Safety	3
ME 755 Nuclear Criticality Safety Engineering	3

Engineering	
ME 756 Monte Carlo Methods in Nuclear Engineering	3
ME 757 Radiation Monitoring and Safeguards Systems	3
ME 758 Accelerator Applications in Nuclear Engineering	3
ME 760 Waste Management And The Nuclear Fuel Cycle	3
ME 762 Nuclear Power Engineering	3
ME 763 Nuclear Reactor Analysis	3
HPS 602 Radiation Detection	3
HPS 603 Radiation Physics and Instrumentation Laboratory	3
HPS 701 Applied Nuclear Physics	3
HPS 703 Radiation Interactions and Transport	3
HPS 719 Introduction to Radioanalytical Chemistry	1
HPS 720 Radiation Dosimetry	3
HPS 730 Advanced Radiation Biology	3

Elective Courses – Credits: 12

Complete 12 credits of 600- or 700-level coursework from within the College of Engineering. Courses from outside the College of Engineering may be taken with advisor approval.

Dissertation – Credits: 18

ME 799 Dissertation	1 – 6

Degree Requirements

Complete a minimum of 21 credits of course work beyond the degree of Master of Science in Engineering (M.S.) or equivalent with an overall minimum GPA of 3.20 and a minimum GPA of 2.70 (B-) in each class. Ph.D. candidates who do not maintain this GPA requirement will be placed on probation.

Out of the 21 credits of course work a minimum of 18 of these credits must be 700-level courses, and no more than 6 credits can be from ME 791 Graduate Independent Study. In addition to these course requirements, a minimum of 18 credits of Dissertation is required.

The student's Doctoral Advisory Committee may add other

requirements in accordance with the individual's background and

area of study. No more than 15 non-matriculated credits including transfer credits are allowed.
The student must identify a Dissertation Advisor within the first semester of joining the program. The student, in consultation with their Advisor, will form a Doctoral Advisory Committee that includes at least five members:

- **One Dissertation Advisor. A student may have two co-Advisors but they count as one committee member.**
- **Three Mechanical Engineering Department faculty members. At the discretion of the Dissertation Advisor and student, one of these three can be from a relevant supporting field outside of the department or university.**
- **One Graduate College representative. The student, in consultation with their Advisor, is responsible for inviting a committee member from within the university but outside the Mechanical Engineering Department. This person is responsible for ensuring consistency and fairness throughout the UNLV graduate programs.**

The program of study must be submitted by the second semester of study. The program of study is to be prepared by the student and their doctoral advisor, and must be approved by the student's Doctoral Advisory Committee and the GPC.
The student must pass a written Qualifying Exam consisting of two sections, Mathematics and a Major subject area chosen from the following list:

- **Dynamics and Control**
- **Fluid Mechanics**
- **Material Science**
- **Solid Mechanics and Mechanical Design**
- **Thermal Sciences**
- **Nuclear Engineering**

These examinations are prepared by a department committee and based on undergraduate senior level courses. Qualifying exams are held every semester. The first attempt at taking the qualifying exam must be scheduled during the first year of study. They can be taken a maximum of two times. Failure to take the exam within the first year or failure to pass the exam in the second attempt will automatically result in terminating the student from the program.

Students must submit a written report to their Doctoral Advisory Committee consisting of a relevant literature review, dissertation research objectives, and outline of planned work to meet those objectives. The student must also present this proposal to their committee and be prepared to discuss and defend their objectives and plan. This report and presentation is known as the "Preliminary Exam".

The Preliminary Exam must be scheduled within one semester of passing the Qualifying Exam.
The Preliminary Exam can be taken only once per semester but may be repeated until passed.

The student is advanced to candidacy for the Ph.D. upon completion of all course work, the Qualifying Exam and the Preliminary Exam.

Graduation Requirements

See Plan Graduation Requirements below.

Subplan 3 Requirements: Post-Bachelor's

Total Credits Required: 63

Course Requirements

Required Courses – Credits: 18

Complete 18 credits from any Mechanical Engineering 600- or 700-level courses.

Elective Courses – Credits: 9

Complete 9 credits of 600- or 700-level coursework from within the College of

Engineering. Courses from outside the College of Engineering may be taken with advisor approval.

Independent Study – Credits: 3

Students are required to take 3 credits of Independent Study

ME 791 Independent Study in Mechanical Engineering	1 – 3

Design Project - Credits: 3

ME 796 Design Project in Mechanical Engineering	1 – 3

Master Degree in Mechanical Engineering

After successfully completing the requirements above, students are eligible to earn the Master of Science in Engineering - Mechanical Engineering

Elective Courses – Credits: 12

Complete 12 credits of 600- or 700-level coursework from within the College of Engineering. Courses from outside the College of Engineering may be taken with advisor approval.

Dissertation – Credits: 18

ME 799 Dissertation	1 – 6

Degree Requirements

Complete a minimum of 45 credits of course work beyond the degree of Bachelor of Science in Engineering (B.S.) or equivalent with an overall minimum GPA of 3.20 and a minimum GPA of 2.70 (B-) in each class. Ph.D. candidates who do not maintain this GPA

requirement will be placed on probation. Students on academic probation may be transferred to the M.S.M.E. Program depending on the student's academic record.

Out of the 45 credits of course work, a minimum of 33 credits must be in 700-level courses, and no more than 9 credits can be from ME 791 Graduate Independent Study. In addition to these course requirements, a minimum of 18 credits of Dissertation is required.

The student's doctoral advisory committee may add more requirements in accordance with the individual's background and field of study. No more than 15 non-matriculated credits including transfer credits is allowed.

The student must identify a Dissertation Advisor within the first semester of joining the program. The student, in consultation with their Advisor, will form a Doctoral Advisory Committee that includes at least five members:

- **One Dissertation Advisor. A student may have two co-Advisors but they count as one committee member.**
- **Three Mechanical Engineering Department faculty members. At the discretion of the Dissertation Advisor and student, one of these three can be from a relevant supporting field outside of the department or university.**
- **One Graduate College representative. The student, in consultation with their Advisor, is responsible for inviting a committee member from within the university but outside the Mechanical Engineering Department. This person is responsible for ensuring consistency and fairness throughout the UNLV graduate programs.**

The program of study must be submitted by the second semester of study. The program of study is to be prepared by the student and their doctoral advisor, and must be approved by the student's Doctoral Advisory Committee and the GPC.

The student must pass a written Qualifying Exam consisting of two sections, Mathematics and a Major subject area chosen from the following list:

- **Dynamics and Control**
- **Fluid Mechanics**
- **Material Science**
- **Solid Mechanics and Mechanical Design**
- **Thermal Sciences**
- **Nuclear Engineering**

These examinations are prepared by a department committee and based on undergraduate senior level courses. Qualifying exams are held every semester. The qualifying exams must be scheduled during the first year of study. They can be taken a maximum of two times. Failure to take the exam within the first year or failure to pass the exam in the second attempt will automatically result in terminating the student from the program.

Students must submit a written report to their Doctoral Advisory Committee consisting of a relevant literature review, dissertation research objectives, and outline of planned work to meet those objectives. The student must also present this proposal to their committee and be prepared to discuss and defend their objectives and plan. This report and presentation is known as the "Preliminary Exam".

The Preliminary Exam must be scheduled within one semester of passing the Qualifying Exam.
The Preliminary Exam can be taken only once per semester but may be repeated until passed.

The student is advanced to candidacy for the Ph.D. upon completion of all course work, the Qualifying Exam and the Preliminary Exam.

Graduation Requirements

See Plan Graduation Requirements below.

Subplan 4 Requirements: Post-Bachelor's Nuclear Engineering

Total Credits Required: 63

Course Requirements

Required Courses – Credits: 18

Complete 3 courses (9 credits) from the following list and 9 credits from any Mechanical Engineering 600- or 700-level courses.

ME 655 Fundamentals of Nuclear Engineering	3
ME 700 Advanced Fluid Mechanics I	3
ME 701 Advanced Fluid Mechanics II	3
ME 702 Computational Fluid Dynamics	3
ME 705 Conduction Heat Transfer	3
ME 706 Convective Heat Transfer	3
ME 707 Radiation Heat Transfer	3
ME 708 Convective Boiling and Condensation	3
ME 711 Advanced Thermodynamics	3
ME 754 Introduction to Nuclear Criticality Safety	3
ME 755 Nuclear Criticality Safety Engineering	3
ME 756 Monte Carlo Methods in Nuclear Engineering	3
ME 760 Waste Management And The Nuclear Fuel Cycle	3
ME 762 Nuclear Power Engineering	3
ME 763 Nuclear Reactor Analysis	3
HPS 602 Radiation Detection	3
HPS 603 Radiation Physics and Instrumentation Laboratory	3
HPS 701 Applied Nuclear Physics	3
HPS 703 Radiation Interactions and Transport	3
HPS 719 Introduction to Radioanalytical Chemistry	1
HPS 720 Radiation Dosimetry	3
HPS 730 Advanced Radiation Biology	3

Elective Courses – Credits: 9

Complete 9 credits of 600- or 700-level coursework from within the College of Engineering. Courses from outside the College of Engineering may be taken with advisor approval.

Independent Study – Credits: 3

Students are required to take 3 credits of Independent Study

ME 791 Independent Study in Mechanical Engineering	1 – 3

Design Project - Credits: 3

ME 796 Design Project in Mechanical Engineering	**1 – 3**

Master Degree in Mechanical Engineering

After successfully completing the requirements above, students are eligible to earn the Master of Science in Engineering - Mechanical Engineering

Elective Courses – Credits: 12

Complete 12 credits of 600- or 700-level coursework from within the College of Engineering. Courses from outside the College of Engineering may be taken with advisor approval.

Dissertation – Credits: 18

ME 799 Dissertation	**1 – 6**

Degree Requirements

Complete a minimum of 45 credits of course work beyond the degree of Bachelor of Science in Engineering (B.S.) or equivalent with an overall minimum GPA of 3.20 and a minimum GPA of 2.70 (B-) in each class. Ph.D. candidates who do not maintain this GPA requirement will be placed on probation. Students on academic probation may be transferred to the M.S.M.E. Program depending on the student's academic record.

Out of the 45 credits of course work, a minimum of 33 credits must be in 700-level courses, and no more than 9 credits can be from ME 791 Graduate Independent Study. In addition to these course requirements, a minimum of 18 credits of Dissertation is required.

The student's doctoral advisory committee may add more requirements in accordance with the individual's background and

field of study. No more than 15 non-matriculated credits including transfer credits is allowed.

The student must identify a Dissertation Advisor within the first semester of joining the program. The student, in consultation with their Advisor, will form a Doctoral Advisory Committee that includes at least five members:

- **One Dissertation Advisor. A student may have two co-Advisors but they count as one committee member.**
- **Three Mechanical Engineering Department faculty members. At the discretion of the Dissertation Advisor and student, one of these three can be from a relevant supporting field outside of the department or university.**
- **One Graduate College representative. The student, in consultation with their Advisor, is responsible for inviting a committee member from within the university but outside the Mechanical Engineering Department. This person is responsible for ensuring consistency and fairness throughout the UNLV graduate programs.**

The program of study must be submitted by the second semester of study. The program of study is to be prepared by the student and their doctoral advisor, and must be approved by the student's Doctoral Advisory Committee and the GPC.
The student must pass a written Qualifying Exam consisting of two sections, Mathematics and a Major subject area chosen from the following list:

- **Dynamics and Control**
- **Fluid Mechanics**
- **Material Science**
- **Solid Mechanics and Mechanical Design**
- **Thermal Sciences**
- **Nuclear Engineering**

These examinations are prepared by a department committee and based on undergraduate senior level courses. Qualifying exams are held every semester. The qualifying exams must be scheduled during the first year of study. They can be taken a maximum of two times. Failure to take the exam within the first year or failure to pass the exam in the second attempt will automatically result in terminating the student from the program.

Students must submit a written report to their Doctoral Advisory

Committee consisting of a relevant literature review, dissertation research objectives, and outline of planned work to meet those

objectives. The student must also present this proposal to their committee and be prepared to discuss and defend their objectives and plan. This report and presentation is known as the "Preliminary Exam".

The Preliminary Exam must be scheduled within one semester of passing the Qualifying Exam.
The Preliminary Exam can be taken only once per semester but may be repeated until passed.

The student is advanced to candidacy for the Ph.D. upon completion of all course work, the Qualifying Exam and the Preliminary Exam.

Graduation Requirements

See Plan Graduation Requirements below.

Subplan 5 Requirements: Integrated BS-PhD

Total Credits Required: 54-60

Students admitted into this subplan have taken 3, 6 or 9 credits of graduate level courses that were applied toward their B.S. degree in Mechanical Engineering at UNLV. These credits reduce the total needed to complete the Ph.D. degree.

Course Requirements

Required Courses – Credits: 18

Complete 18 credits from any Mechanical Engineering 600- or 700-level courses.

Elective Courses – Credits: 6

Elective Courses – Credits: 9

Complete 9 credits of 600- or 700-level coursework from within the College of Engineering. Courses from outside the College of Engineering may be taken with advisor approval.

Independent Study – Credits: 3

Students are required to take 3 credits of Independent Study

ME 791 Independent Study in Mechanical Engineering	1 – 3

Design Project - Credits: 3

ME 796 Design Project in Mechanical Engineering	1 – 3

Master Degree in Mechanical Engineering

After successfully completing the requirements above, students are eligible to earn the Master of Science in Engineering - Mechanical Engineering

Elective Courses – Credits: 3-9

Complete 3-9 credits of 600- or 700-level coursework from within the College of Engineering. The total number of credits depends on the number of graduate credits taken toward the student's B.S. degree. Courses from outside the College of Engineering may be taken with advisor approval.

Dissertation – Credits: 18

ME 799 Dissertation	1 – 6

Degree Requirements

Complete a minimum of 36-42 credits of course work beyond the degree of Bachelor of Science in Engineering (B.S.) or equivalent with an overall minimum GPA of 3.20 and a minimum GPA of 2.70 (B-) in each class. The exact number of credits needed depends on the number of graduate credits applied toward the students' B.S. degree. Ph.D. candidates who do not maintain this GPA requirement will be placed on probation. Students on academic probation may be transferred to the M.S.M.E. Program depending on the student's academic record.

Out of the 36-42 credits of course work, a minimum of 33 credits must be in 700-level courses, and no more than 9 credits can be from ME 791 Graduate Independent Study. Students who took 700-level courses toward their B.S. degree can count these credits toward the required total of 33 700-level credits. In addition to these course requirements, a minimum of 18 credits of Dissertation is required.

The student's doctoral advisory committee may add more requirements in accordance with the individual's background and field of study. No more than 15 non-matriculated credits including transfer credits is allowed.

The student must identify a Dissertation Advisor within the first semester of joining the program. The student, in consultation with their Advisor, will form a Doctoral Advisory Committee that includes at least five members:

- **One Dissertation Advisor. A student may have two co-Advisors but they count as one committee member.**
- **Three Mechanical Engineering Department faculty members. At the discretion of the Dissertation Advisor and student, one of these three can be from a relevant supporting field outside of the department or university.**
- **One Graduate College representative. The student, in consultation with their Advisor, is responsible for inviting a committee member from within the university but outside the Mechanical Engineering Department. This person is responsible for ensuring consistency and fairness throughout the UNLV graduate programs.**

The program of study must be submitted by the second semester of study. The program of study is to be prepared by the student and their doctoral advisor, and must be approved by the student's Doctoral Advisory Committee and the GPC.

The student must pass a written Qualifying Exam consisting of

The student must pass a written Qualifying Exam consisting of two sections, Mathematics and a Major subject area chosen from the following list:

- Dynamics and Control
- Fluid Mechanics
- Material Science
- Solid Mechanics and Mechanical Design
- Thermal Sciences
- Nuclear Engineering

These examinations are prepared by a department committee and based on undergraduate senior level courses. Qualifying exams are held every semester. The qualifying exams must be scheduled during the first year of study. They can be taken a maximum of two times. Failure to take the exam within the first year or failure to pass the exam in the second attempt will automatically result in terminating the student from the program.

Students must submit a written report to their Doctoral Advisory Committee consisting of a relevant literature review, dissertation research objectives, and outline of planned work to meet those objectives. The student must also present this proposal to their committee and be prepared to discuss and defend their objectives and plan. This report and presentation is known as the "Preliminary Exam".

- The Preliminary Exam must be scheduled within one semester of passing the Qualifying Exam.
- The Preliminary Exam can be taken only once per semester but may be repeated until passed.

The student is advanced to candidacy for the Ph.D. upon completion of all course work, the Qualifying Exam and the Preliminary Exam.

Graduation Requirements

See Plan Graduation Requirements below.

Subplan 6 Requirements: Integrated BS-PhD Nuclear Engineering

Total Credits Required: 54-60

Students admitted into this subplan have taken 3, 6 or 9 credits of graduate level courses that were applied toward their B.S. degree in Mechanical Engineering at UNLV. These credits reduce the total needed to complete the Ph.D. degree.

Course Requirements

Required Courses – Credits: 18

Complete 9 credits from any Mechanical Engineering 600- or 700-level courses and an additional 9 credits from the following list of courses:

ME 655 Fundamentals of Nuclear Engineering	**3**
ME 700 Advanced Fluid Mechanics I	**3**
ME 701 Advanced Fluid Mechanics II	**3**
ME 702 Computational Fluid Dynamics	**3**
ME 705 Conduction Heat Transfer	**3**
ME 706 Convective Heat Transfer	**3**
ME 707 Radiation Heat Transfer	**3**
ME 708 Convective Boiling and Condensation	**3**
ME 711 Advanced Thermodynamics	**3**
ME 754 Introduction to Nuclear Criticality Safety	**3**
ME 755 Nuclear Criticality Safety Engineering	**3**
ME 756 Monte Carlo Methods in Nuclear Engineering	**3**
ME 760 Waste Management And The Nuclear Fuel Cycle	**3**
ME 762 Nuclear Power Engineering	**3**
ME 763 Nuclear Reactor Analysis	**3**
HPS 602 Radiation Detection	**3**
HPS 603 Radiation Physics and Instrumentation Laboratory	**3**
HPS 701 Applied Nuclear Physics	**3**
HPS 703 Radiation Interactions and Transport	**3**
HPS 719 Introduction to Radioanalytical Chemistry	**1**
HPS 720 Radiation Dosimetry	**3**
HPS 730 Advanced Radiation Biology	**3**

Elective Courses – Credits: 9

Complete 9 credits of 600- or 700-level coursework from within the College of Engineering. Courses from outside the College of Engineering may be taken with advisor approval.

Independent Study – Credits: 3

Students are required to take 3 credits of Independent Study

ME 791 Independent Study in Mechanical Engineering	1 – 3

Design Project - Credits: 3

ME 796 Design Project in Mechanical Engineering	1 – 3

Master Degree in Mechanical Engineering

After successfully completing the requirements above, students are eligible to earn the Master of Science in Engineering - Mechanical Engineering

Elective Courses – Credits: 3-9

Complete 3-9 credits of 600- or 700-level coursework from within the College of Engineering. The total number of credits depends on the number of graduate credits taken toward the student's B.S. degree. Courses from outside the College of Engineering may be taken with advisor approval.

Dissertation – Credits: 18

ME 799 Dissertation	1 – 6

Degree Requirements

Complete a minimum of 36-42 credits of course work beyond the degree of Bachelor of Science in Engineering (B.S.) or equivalent with an overall minimum GPA of 3.20 and a minimum GPA of 2.70 (B-) in each class. The exact number of credits needed depends on the number of graduate credits applied toward the students' B.S. degree. Ph.D. candidates who do not maintain this GPA requirement will be placed on probation. Students on academic probation may be transferred to the M.S.M.E. Program depending on the student's academic record.

Out of the 36-42 credits of course work, a minimum of 33 credits must be in 700-level courses, and no more than 9 credits can be from ME 791 Graduate Independent Study. Students who took 700-level courses toward their B.S. degree can count these credits toward the required total of 33 700-level credits. In addition to these course requirements, a minimum of 18 credits of Dissertation is required.

The student's doctoral advisory committee may add more requirements in accordance with the individual's background and field of study. No more than 15 non-matriculated credits including transfer credits is allowed.

The student must identify a Dissertation Advisor within the first semester of joining the program. The student, in consultation with their Advisor, will form a Doctoral Advisory Committee that includes at least five members:

- **One Dissertation Advisor. A student may have two co-Advisors but they count as one committee member.**
- **Three Mechanical Engineering Department faculty members. At the discretion of the Dissertation Advisor and student, one of these three can be from a relevant supporting field outside of the department or university.**
- **One Graduate College representative. The student, in consultation with their Advisor, is responsible for inviting a committee member from within the university but outside the Mechanical Engineering Department. This person is responsible for ensuring consistency and fairness throughout the UNLV graduate programs.**

The program of study must be submitted by the second semester of study. The program of study is to be prepared by the student and their doctoral advisor, and must be approved by the student's Doctoral Advisory Committee and the GPC.

The student must pass a written Qualifying Exam consisting of

The student must pass a written Qualifying Exam consisting of two sections, Mathematics and a Major subject area chosen from the following list:

- Dynamics and Control
- Fluid Mechanics
- Material Science
- Solid Mechanics and Mechanical Design
- Thermal Sciences
- Nuclear Engineering

These examinations are prepared by a department committee and based on undergraduate senior level courses. Qualifying exams are held every semester. The qualifying exams must be scheduled during the first year of study. They can be taken a maximum of two times. Failure to take the exam within the first year or failure to pass the exam in the second attempt will automatically result in terminating the student from the program.

Students must submit a written report to their Doctoral Advisory Committee consisting of a relevant literature review, dissertation research objectives, and outline of planned work to meet those objectives. The student must also present this proposal to their committee and be prepared to discuss and defend their objectives and plan. This report and presentation is known as the "Preliminary Exam".

- The Preliminary Exam must be scheduled within one semester of passing the Qualifying Exam.
- The Preliminary Exam can be taken only once per semester but may be repeated until passed.

The student is advanced to candidacy for the Ph.D. upon completion of all course work, the Qualifying Exam and the Preliminary Exam.

Graduation Requirements

See Plan Graduation Requirements below.

Plan Graduation Requirements

The student must submit all required forms to the Graduate College as well as apply for graduation up to two semesters prior to completing their degree requirements.
The student must submit and successfully defend their dissertation by the posted deadline. The defense must be advertised and is open to the public.
After the dissertation defense, the student must electronically submit a properly formatted pdf copy of their dissertation to the Graduate College for format check. Once the dissertation format has been approved by the Graduate College, the student will submit the approved electronic version to ProQuest. Deadlines for dissertation defenses, format check submissions, and the final ProQuest submission can be found here.

Advising and Culminating Experience

With these changes, will students in this program need a Grad Advisory Committee (GAC) formed?
- ○ Yes
- ◉ No

If yes, please list the applicable subplans that will need a GAC:

With these changes, will students be assigned a faculty advisory prior to GAC formation?
- ○ Yes
- ◉ No

If yes, please list the applicable subplans that will need an advisor:

Comments:

For Master's program only: With these changes, does this program require a prospectus form?
- ○ Yes
- ○ No

If yes, please list applicable subplans:

With these changes, will the culminating experience be a
- ○ Yes
- ◉ No

course?

If yes, please provide course prefix, number and name:

With these changes, describe the culminating experience (requirements, if applicable-which subplans will need GACs, forms, etc.):

The Degrees Directory provides current and consistent degree information. Submission of this form indicates acknowledgment and understanding that every department is responsible creating and maintaining accurate and updated program information on the UNLV Degrees Directory.

If new courses are added as placeholders within this proposal, new courses must be created using a Course Create form simultaneously to the process of this proposal.

Degrees Directory Program Entry:* ☑ Check this box to acknowledge the above statement.

Changes will be applicable to:*
- ○ Current Students
- ○ New Students
- ◉ Both Current and New Students

If applicable to current students, changes are:* ○ Mandatory ◉ Optional

If mandatory:*
- ○ If mandatory, I confirm that all students will be notified in writing of these changes as approved by the graduate college
- ◉ Not Mandatory

Effective Date:* Fall 2022

READY TO SUBMIT?

After making all your intended changes, please follow these steps:

1. **Finish the launch of your proposal by clicking the decisions icon  located to the right of the form. This will display a new decision/approval field on the top right.**
2. **Click on "approve", add an optional comment if necessary, and then click on the "Make My Decision" button at the bottom to move the proposal forward to the next step. You will see a notification indicating that the proposal has moved forward. You will not be able to edit after moving the proposal forward.**
3. **Please note that it is your responsibility as the proposer to see that the proposal is reviewed and receives all necessary approvals. Please be encouraged to reach out to reviewers on each step, if necessary.**
4. **You can check the status of the proposal by clicking on the workflow status icon  to verify that the proposal has gone to the next step.**

   The workflow status icon  will also show you the current step of the proposal at any given time, and who are the reviewers at that step.

QUESTIONS? contact gradcurriculum@unlv.edu

III. Department Vote Information

Note: This section is to be filled out by the Department Chair on behalf of the department committee.

(The role has been assigned to the corresponding person on this step. If incorrect, please notify gradcurriculum@unlv.edu).

1. Review the proposal. Discuss and make appropriate revisions.

2. Fill in vote information in the fields below, along with the approval. If Dual or Interdisciplinary: add votes from all departments/colleges involved

3. Then approve/reject by clicking the decisions icon  located to the right of the form. This will display a new decision/approval field on the top right. Click on "approve", add an optional comment if necessary, and then click on the "Make My Decision" button at the bottom to move the proposal forward to the next step. You will see a notification indicating that the proposal has moved forward. You will not be able to edit after moving the proposal forward.

The workflow status icon  will also show you the current step of the proposal at any given time, and who are the reviewers at that step.

If there were any modifications to the proposal, please enter them in the comments box below:

Comments:

Date faculty voted on proposal: 10/22/2021

Result of vote: 19-0

Manner of vote: online

IV. College Vote Information

Note: This section is to be filled out by the Academic Associate Dean on behalf of the college/school committee.

(The role has been assigned to the corresponding person on this step. If incorrect, please notify gradcurriculum@unlv.edu).

1. Review the proposal. Discuss and make appropriate revisions.

2. Fill in vote information in the fields below, along with the approval. If Dual or Interdisciplinary: add votes from all departments/colleges involved

3. Then approve/reject by clicking the decisions icon located to the right of the form. This will display a new decision/approval field on the top right. Click on "approve", add an optional comment if necessary, and then click on the "Make My Decision" button at the bottom to move the proposal forward to the next step. You will see a notification indicating that the proposal has moved forward. You will not be able to edit after moving the proposal forward.

The workflow status icon will also show you the current step of the proposal at any given time, and who are the reviewers at that step.

Date faculty voted on proposal: 12/10/21

Result of vote: 4/0/0

Manner of vote: online

V. Graduate College Use Only - Code Request Items

Note: This section is for graduate college use only.

Academic Organization:

Academic Program Code:

Academic Plan Code:

Plan Description (30 chars):	
Transcript Description:	
Subplan Code:	
Subplan Description:	
Subplan Type:	○ Track ○ Concentration ○ Option/Dual ○ Embedded/Track
Subplan on Transcript?	○ YES ○ NO
Effective Date and First Term Valid:	
Length / Avg. Time to Degree:	
CIP code and title:	
Other Codes Needed:	
Description / implementation field (do not edit)	

Comments for Doctor of Philosophy - Mechanical Engineering

Curriculog — 2/3/2022 3:00 pm Reply

Emily Lin has approved this proposal on Graduate College Dean.

Curriculog — 2/3/2022 1:51 pm Reply

Graduate Curriculum has approved this proposal on Graduate Programs Committee.

Gregory Moody — 2/2/2022 12:57 pm Reply

Motion passes: 14-0

Curriculog — 2/2/2022 12:57 pm Reply

Gregory Moody has approved this proposal on Graduate Programs Committee.

Curriculog — 12/13/2021 3:46 pm Reply

Mohamed Trabia has approved this proposal on School/College Associate Dean/ Dean.

Melissa Morris — 12/12/2021 1:25 pm Reply

approved via email vote on 12/10/21

Curriculog — 12/12/2021 1:25 pm Reply

Melissa Morris has approved this proposal on School/College Committee.

Curriculog — 11/18/2021 5:59 pm Reply

Mechanical Chair has approved this proposal on Department Chair.

Curriculog — 11/18/2021 2:58 pm Reply

Mechanical Graduate Coordinator has approved this proposal on Graduate Coordinator.

Curriculog — 11/18/2021 10:05 am Reply

Graduate Curriculum has approved this proposal on Technical Review.

Curriculog — 10/28/2021 3:58 pm Reply

Hui Zhao has approved this proposal on Originator.

Curriculog 10/28/2021 3:58 pm Reply

Hui Zhao has launched this proposal.

Curriculog 10/28/2021 3:51 pm Reply

Hui Zhao imported from the map 2022-2023 - Working Graduate Catalog into the following proposal fields: I. General Information: Department (s) (if Dual or Interdisciplinary please add all departments):, I. General Information: Degree or Certificate Name:, I. General Information: Degree Type:, I. General Information: Program Type:, II. Program Changes: Proposed Curriculum:, V. Graduate College Use Only - Code Request Items: Description / implementation field (do not edit).