Program Change Request

Date Submitted: 01/11/22 10:00 am

Viewing: MSENPH : Materials Science & Engineering, Doctor of Philosophy

Last approved: 11/29/21 10:56 am

Last edit: 03/02/22 2:57 pm

Changes proposed by: mleftwi

Catalog Pages Using this Program

- Microelectronics–Photonics (MEPH)
- Materials Science and Engineering (MSEN)

Submitter:	User ID:	**mleftwi** ~~rickwise~~	Phone: 575-2875
Program Status	Active		
Academic Level	Graduate		
Type of proposal	Major/Field of Study		

Select a reason for this modification

Making Minor Changes to an Existing Certificate or Degree (e.g. changing 15 or fewer hours, changing admission/graduation requirements, adding/changing Focused Study or Track)

Are you adding a concentration?

No

Are you adding or modifying a track?

No

Are you adding or modifying a focused study?

No

Effective Catalog Year Fall 2022

College/School Code

In Workflow

1. **GRAD Dean Initial**
2. **GRAD Dean Initial**
3. **Director of Curriculum Review and Program Assessment**
4. **Registrar Initial**
5. **Institutional Research**
6. **MSEN Chair**
7. **ARSC Dean**
8. **ENGR Dean**
9. **GRAD Dean**
10. **Global Campus**
11. **Provost Review**
12. **University Course and Program Committee**
13. **Graduate Council**
14. **Faculty Senate**
15. Provost Final
16. Registrar Final
17. Catalog Editor Final

Approval Path

1. 01/11/22 10:31 am Jim Gigantino (jgiganti): Approved for GRAD Dean Initial
2. 01/11/22 10:35 am Jim Gigantino (jgiganti): Approved

Graduate School and International Education (GRAD)

Department Code

Materials Science and Engineering (MSEN)

Program Code MSENPH

Degree Doctor of Philosophy

CIP Code

for GRAD Dean Initial

3. 01/12/22 11:45 am Alice Griffin (agriffin): Approved for Director of Curriculum Review and Program Assessment
4. 01/12/22 1:51 pm Gina Daugherty (gdaugher): Approved for Registrar Initial
5. 01/12/22 3:00 pm Doug Miles (dmiles): Approved for Institutional Research
6. 02/17/22 11:25 am Jim Gigantino (jgiganti): Approved for MSEN Chair
7. 02/17/22 3:26 pm Jeannie Hulen (jhulen): Approved for ARSC Dean
8. 02/18/22 3:28 pm Kevin Hall (kdhall): Approved for ENGR Dean
9. 02/18/22 3:45 pm Jim Gigantino (jgiganti): Approved for GRAD Dean
10. 02/18/22 3:56 pm Suzanne Kenner (skenner): Approved for Global Campus

11. 02/19/22 11:56 am Ketevan Mamiseishvili (kmamisei): Approved for Provost Review
12. 02/19/22 6:04 pm Alice Griffin (agriffin): Rollback to Provost Review for University Course and Program Committee
13. 03/02/22 10:58 am Ketevan Mamiseishvili (kmamisei): Approved for Provost Review
14. 03/18/22 4:29 pm Alice Griffin (agriffin): Approved for University Course and Program Committee
15. 04/21/22 2:40 pm Jim Gigantino (jgiganti): Approved for Graduate Council

History

1. May 12, 2020 by Rick Wise (rickwise)
2. Nov 29, 2021 by Rick Wise (rickwise)

14.1801 - Materials Engineering.

Program Title

Materials Science & Engineering, Doctor of Philosophy

Program Delivery Method

On Campus

Is this program interdisciplinary?

Yes

College(s)/School(s)

College/School Name
Fulbright College of Arts and Sciences (ARSC)
College of Engineering (ENGR)

Does this proposal impact any courses from another College/School?

No

What are the total hours needed to complete the program? 48

Program Requirements and Description

Requirements

Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the Materials Science and Engineering Program Director to define their dissertation committee after they are accepted by a research faculty for a research project. This committee will be made up of at least four faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering. The student's research professor will chair the dissertation committee. Candidates for the Ph.D. program are expected to have completed a Master of Science degree in either engineering or science, with each candidate's academic background being evaluated by the Graduate Studies Committee of the Materials Science and Engineering program. Doctoral candidates in Materials Science and Engineering are expected to have proficiency in the core curriculum of the Master of Science in Materials Engineering or Master of Science in Materials Science at the University of Arkansas. This core is described in the requirements for the Master of Science in Materials Engineering and the Master of Science in Materials Science, as well as in the handbook of the Materials Science & Engineering **program.** ~~program and is the knowledge that will be tested in the Materials Science & Engineering specific candidacy exam administered in the spring semester of each academic year.~~

Students who have graduated with a Master of Science degree in Materials Engineering or a Master of Science degree in Materials Science ~~from the University of Arkansas~~ will be expected to take the Materials Science and Engineering ~~written~~ Ph.D. **candidacy exam. The MSEN Ph.D.** ~~A second part of the candidacy exam in the first~~

~~spring semester afterM.S.graduation.Students requesting admission to thePh.D.program with a Master of Science degree from another institution or from another discipline will be required to take the Materials Science & Engineering writtenPh.D.candidacy exam within four semesters after admission to the PhD program and after having completed MSEN 5383 Research Commercialization and Product Development andMSEN 6323 Materials Engineering Design.~~ candidacy **exam is** ~~exam,~~ a detailed Ph.D. research **proposal and it** ~~proposal,~~ must be accepted by the student's committee before the end of the 30th month after the start date of the student's first semester as a Ph.D. student, or the student will be removed from the Ph.D. **program. The student is** ~~candidacy exam within four semesters after admission~~ **to complete the candidacy exam process after** ~~PhD program and after~~ **having completed MSEN 5383 Research Commercialization and Product Development and MSEN 6323 Materials Engineering Design.**

~~program. This research proposal is not linked to the written candidacy exam and may be presented to the committee any time in this 30 monthperiod.Students who fail to pass their written candidacy exam will have a joint consultation with their major professor and the MSEN Program Director to formulate a specific action plan to correct student deficiencies identified by theexam.The student will be allowed to retake the written exam only one additional time. Students may be allowed a one-year extension before the first or second attempt at the written candidacy exam if requested by the student's major professor and approved by their dissertation committee and the MSEN Program Director.~~ A Ph.D. curriculum will be defined to meet each student's research interests as well as ensure the Materials Science and Engineering program's core courses have been taken. The course plan for each student must include a minimum of 27 hours of graduate coursework beyond the Master of Science degree requirements. Specific courses will be chosen by the student and must be approved by the student's major professor and the MSEN Program Director. The coursework list for the Ph.D. degree will be dependent upon the M.S. degree with which the student enters the program:

Subject Area	M.S. in Materials Engineering or Materials Science from UA/Hours	M.S. in Materials Engineering or Materials Science from another institution/Hours	Other Science or Engineering M.S. degrees/Hours
MSEN 6313 Advanced Materials Science & Engineering	3	3	3
BENG 5703 Design and Analysis of Experiments for Engineering Research OR INEG 5333 Design of Industrial Experiments OR other Design of Experiments course	3	3	3
MSEN 5821 Ethics for Scientists and Engineers	1 (Applied from MS curriculum)	1	1
MSEN 6323 Materials Engineering Design	If not taken in MS curriculum	3	3
MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	Taken in MS curriculum	4	4

Subject Area	M.S. in Materials Engineering or Materials Science from UA/Hours	M.S. in Materials Engineering or Materials Science from another institution/Hours	Other Science or Engineering M.S. degrees/Hours
MSEN 5383 Research Commercialization and Product Development	Taken in MS curriculum	3	3
5000- and 6000-level elective courses in science and engineering	17-20	10	5
MSEN 5322 Materials Characterization	Taken in MS curriculum	Recommended elective	2
MSEN 5313 Fundamentals of Materials Science	Taken in MS curriculum	Recommended elective	3
MSEN 5253 Emerging Technologies in Industry	Recommended elective	Recommended elective	Recommended Elective
MSEN 700V Dissertation	21	21	21
Total	48	48	48

If a student is taking either a special problems independent study course, such as MSEN 588V, or a special topics course, such as MSEN 587V, to meet partial requirements for their Ph.D. degree, then the instructor must supply the Materials Science and Engineering program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Students are required to attend monthly Materials Science and Engineering Research Communication Seminars during the first five semesters of their Ph.D. degree program, and will enroll in MSEN 6611 Research Communication Seminar of PhD Students in their fifth semester.

The dissertation format must meet all Graduate School published guidelines and the guidelines as listed in the Materials Science and Engineering Graduate Student Handbook. Students may use bound published papers for their dissertation provided that:

It contains a minimum of three peer-reviewed archival journal articles which have been published or accepted for publication;

The Ph.D. candidate is first author on all articles used; and,

It contains additional text to connect the articles in the context of the overall research effort in accordance with the Graduate School guidelines and must include program required front matter and appendices.

If submission of a third paper is held up due to an intellectual property filing, or IP filing, the third paper prepared for submission for a peer-reviewed archival journal may be included in the dissertation to meet the three paper requirement if a patent disclosure covering the intellectual property has been approved for provisional filing by the University of Arkansas patent committee. The patent disclosure and documentation of approval for provisional filing must be contained within an appendix to the dissertation.

Students should also be aware of Graduate School requirements with regard to doctoral degrees.

Are Similar Programs available in the area?

No

Estimated Student Demand for Program: 40

Scheduled Program Review Date: 2027-2028

Program Goals and Objectives

Program Goals and Objectives

1. Provide students with interdisciplinary education and training in materials science engineering to meet the needs of emerging technology industries.

2. Place students in interdisciplinary groups performing rigorous and challenging research to prepare them for careers in industrial research teams, national labs, and academic positions.

3. Prepare students to be effective in technology management and entrepreneurship.

Learning Outcomes

Learning Outcomes

Learning Outcomes
1. Define and explore new areas of research in an interdisciplinary environment, expanding the breadth and depth of state-of-the-art knowledge in the field of materials, materials processing, and devices enabled by advances in materials. 2. Master knowledge, practices, and skills from traditional graduate level programs in Physics, Chemistry, Electrical Engineering, Chemical Engineering, Mechanical Engineering, Biological Engineering, and Biomedical Engineering, regardless of prior traditional educational background. 3. Communicate effectively deep level knowledge of their work to persons well-versed in their field, detailed technical concepts to persons with strong technical backgrounds outside of their field, and general concepts and applications to the general public. 4. Work efficiently in interdisciplinary team environments, fully supporting team goals through active membership or through team leadership as appropriate. 5. Implement intellectual property management and research commercialization processes, encouraging migration of ideas from formulation to societal benefit during their professional careers. 6. Execute duties found in entry-level professional positions with the operational skills equivalent to at least one year’s experience in that position. 7. Embrace the role of citizen-scientist in both their professional and societal communities, utilizing their sound ethical and analytical backgrounds, to lead the discussions that will be needed to balance what can be done with what should be done.

Description and justification of the request

Description of specific change	Justification for this change

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During August 2021, the MSEN faculty and program director determined it best practice for the MSENPH program to remove the unique topic based written candidacy exam from the MSENPH candidacy exam process. A unanimous decision was reached via email and the changes herein remove the narrative/wording regarding the unique written candidacy exam. The same changes have been implemented in an updated MSEN Graduate Student handbook published on Jan. 10, 2022.	The primary reason that this decision was made was to: 1) level the playing field in regards to candidacy exam requirements in other STEM graduate programs on campus. 2) To improve enrollment and retention of MSEN PhD students. 3) To reduce the additional burden on MSEN faculty and staff that was required to conduct the unique written candidacy exam process from Dec. 1 - February 1 each year.

Upload attachments

Reviewer Comments

Alice Griffin (agriffin) (02/19/22 6:04 pm): Rollback: Per request. UCPC monthly agenda already published. Rolling back to hold for next month. Thank you.

Alice Griffin (agriffin) (03/02/22 2:57 pm): Changed effective date from spring 2022 to fall 2022, pending successful completion of the approval process.

Key: 257