

New Program Proposal

Date Submitted: 04/15/24 12:00 pm

Viewing: **MATSMS-QMAD : Materials Science: 2-Dimensional Quantum Materials and Devices Concentration**

Last edit: 11/14/24 8:00 pm

Changes proposed by: mleftwi

Submitter: User ID: mleftwi@uark.edu Phone: 575-2875

Program Status Active

Academic Level Graduate

Type of proposal Concentration

Select a reason for this new program Adding New Concentration

Effective Catalog Year Fall 2025

College/School Code Graduate School and International Education (GRAD)

Department Code Materials Science and Engineering (MSEN)

Program Code MATSMS-QMAD

Degree Master of Science in Materials Science

CIP 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. GRAD Dean
8. Global Campus
9. Provost Review
10. Graduate Council
11. Faculty Senate
12. Provost Final
13. Provost's Office-- Documentation sent to System Office
14. Higher Learning Commission
15. Board of Trustees
16. ADHE Final
17. Provost's Office-- Notification of Approval
18. Registrar Final
19. Catalog Editor Final

Approval Path

1. 06/27/24 9:27 am
Ed Bengtson
(egbengts):
Approved for GRAD
Dean Initial
2. 06/27/24 9:32 am
Ed Bengtson

- (egbengts):
Approved for GRAD
Dean Initial
3. 10/29/24 4:38 pm
Lisa Kulczak
(lkulcza): Approved
for Director of
Curriculum Review
and Program
Assessment
4. 10/30/24 2:15 pm
Gina Daugherty
(gdaugher):
Approved for
Registrar Initial
5. 10/31/24 11:36 am
Doug Miles
(dmiles): Approved
for Institutional
Research
6. 10/31/24 12:33 pm
Ed Bengtson
(egbengts):
Approved for MSEN
Chair
7. 10/31/24 12:33 pm
Ed Bengtson
(egbengts):
Approved for GRAD
Dean
8. 10/31/24 12:34 pm
Suzanne Kenner
(skenner): Approved
for Global Campus
9. 10/31/24 3:16 pm
Jim Gigantino
(jgiganti): Approved
for Provost Review
10. 11/23/24 7:06 am
Ed Bengtson
(egbengts):

Approved for
Graduate Council

40.1001 - Materials Science.

Program Title

Materials Science: 2-Dimensional Quantum Materials and Devices Concentration

Program Delivery

Method

On Campus

Is this program interdisciplinary between two or more colleges or schools?

Yes

College(s)/School(s)

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

Do the proposed changes impact any specific course(s) from another college or school?

No

What are the total
hours needed to
complete the
program?

33

Program Requirements and Description

Requirements

Concentration in 2-Dimensional Quantum Materials and Devices

Choose nine hours of the following:

[MSEN 5880V](#) Special Problems in Materials Science and Engineering (Functional Materials: From Synthesis to Properties) ^{required for NSF NRT trainees}

or [PHYS 5880V](#) Selected Topics in Physics

[MSEN 5880V](#) Special Problems in Materials Science and Engineering (Electrodynamics of Quantum Devices) ^{required for NSF NRT trainees}

or [PHYS 5880V](#) Selected Topics in Physics

[MSEN 5880V](#) Special Problems in Materials Science and Engineering (Functional Materials Laboratory)

or PHYS 5880V	Selected Topics in Physics
MSEN 5870V	Special Topics in Materials Science and Engineering (Materials & Mechanisms for Quantum Computing) <small>required for NSF NRT trainees</small>
or MSEN 5870V	Special Topics in Materials Science and Engineering
CSCE 50603	Machine Learning
CSCE 50703	Data Mining
PHYS 54203	Quantum Mechanics II

Program Costs

NA

Library Resources

NA

Instructional

Facilities

NA

Faculty Resources

NA

List Existing Certificate or Degree Programs that Support the Proposed Program

Program(s)
MATSMS - Materials Science, Master of Science in Materials Science

Are Similar Programs available in the area?

No

Estimated Student Demand for Program 15

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 and engineering to meet the needs of emerging technology industries.
2. Place students in interdisciplinary groups performing rigorous and challenging research to prepare them for

Program Goals and Objectives

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

1. Conduct independent investigations 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.

Description and Justification for this request

Description of request	Justification for request
We are adding a new concentration area to the MATS-MS degree. This is the 2D-QMaD (QMAD) concentration area noted in the "requirements" above.	This is a new concentration area being added as a result of our recent NSF-NRT award and additional programmatic requirements to add the new 2D-QMaD (QMAD) concentration area.

Upload attachments

[Letter_of_Notification_MATSMS-QMAD.pdf](#)

[MATSMS-QMAD - New Concentration - Ltr of Notification_Rev_BOT.pdf](#)

Reviewer Comments

Lisa Kulczak (lkulcza) (08/27/24 4:58 pm): Updated next scheduled program review, adjusted program title to match established naming conventions for programs/concentrations, added hours needed to complete program. Due to changes made by ADHE, new concentrations now require off-campus approval and submission of the appropriate ADHE form. Have been in contact with program to request a Letter of Notification, which I will upload to this proposal. ATTENTION REGISTRAR: This proposal will need off-campus approval; please adjust the workflow accordingly.

Lisa Kulczak (lkulcza) (10/29/24 4:18 pm): Uploaded LON as provided by the program. Uploaded revised LON with dates inserted.

Lisa Kulczak (lkulcza) (10/29/24 5:04 pm): ATTENTION REGISTRAR: Also please remove Undergraduate Council from the workflow.

Gina Daugherty (gdaugher) (10/30/24 2:15 pm): Updated workflow to include off campus approval steps and removed Undergraduate Council from workflow.