

May 3, 2011

Dean Matthew O'Donnell
College of Engineering
Box 352180

Dear Matt:

Based on the recommendation of its Subcommittee on Admissions and Programs, the Faculty Council on Academic Standards has recommended approval of the option in Nanoscience and Molecular Engineering within the Bachelor of Science in Materials Science and Engineering degree. A copy of the changes is attached.

I am writing to inform you that the Department of Materials Science and Engineering is authorized to specify these requirements beginning spring quarter 2011.

The new requirements should be incorporated in printed statements and in individual department websites as soon as possible. The *General Catalog* website will be updated accordingly by the Registrar's Office.

Sincerely yours,



Phyllis M. Wise
Interim President

Enclosure

cc: Ms. Kathleen Elkins (with enclosure)
Mr. Robert Corbett (with enclosure)
Dr. Deborah H. Wiegand (with enclosure)
Ms. Virjean Edwards (with enclosure MSE-20101208)



UNIVERSITY OF WASHINGTON

CREATING AND CHANGING UNDERGRADUATE ACADEMIC PROGRAMS

JAN 21 2011

OFFICE USE ONLY

Control #

MSE-20101208

After college/university/campus review, send signed original and 2 copies to the Chancellor's Office/DOAS, Box 555850.

For information about when and how to use this form: <http://depts.washington.edu/uwcr/1503instructions.pdf>

College/Campus College of Engineering

Department/Unit Materials Science & Engine

Date Dec. 8, 2010

New Programs

- Leading to a Bachelor of _____ in _____ degree.
- Leading to a Bachelor of _____ degree with a major in _____.
- Leading to a Nanoscience and Molecular Engineering Option within the existing major in Materials Science and Engineering.
- Leading to a minor in _____.

Changes to Existing Programs

- New Admission Requirements for the Major in _____ within the Bachelor of _____.
- Revised Admission Requirements for the Major in MSE with NME option within the Bachelor of Science.
- Revised Program Requirements for the Major in _____ within the Bachelor of _____.
- Revised Requirements for the Option in _____ within the major in _____.
- Revised Requirements for the Minor in _____.

Other Changes

- Change name of program from _____ to _____.
- New or Revised Continuation Policy for _____.
- Eliminate program in _____.

Proposed Effective Date: **Quarter:** Autumn Winter Spring Summer **Year:** 20 11

Contact Person: Kathleen A. Elkins

Phone: 6-6581

Email: kelkins@uw.edu

Box: 352120

EXPLANATION OF AND RATIONALE FOR PROPOSED CHANGE

For new program, please include any relevant supporting documentation such as student learning outcomes, projected enrollments, letters of support and departmental handouts. (Use additional pages if necessary).

The Department of Materials Science and Engineering will offer an "OPTION" in Nanoscience and Molecular Engineering (NME) for undergraduate majors in Materials Science and Engineering (MSE). The Option program will include:

- introduction to molecular and nanoscale principles (NME 220)--4 cr.
- hands-on experience in Materials Characterization (senior research project--4-5 cr. MSE 499 , optional co-op--2 max.), 4-7 total cr.
- interdisciplinary seminars in nanotechnology (NME 221/321/421)--3 cr.
- interdisciplinary lecture courses in NME (MSE, nanoscience, and molecular engineering principles; three courses selected from NME/MSE Option electives courses list)--9-12 cr.

With the NME Option our students will experience appreciation of the interconnected scientific and engineering strategies that promote various novel and effective technologies from a guided molecular and nano-scale perspective.

This Option is also in conjunction with current campus developments in nanoscience and molecular engineering in BIOEN, CHEM, EE, ME, PHYS, AND CHEME and is intended to formally acknowledge coursework and lab experience in nanotechnology.

OTHER DEPARTMENTS AFFECTED

List all departments/units/ or co-accredited programs affected by your new program or changes to your existing program and acquire the signature of the chair/director of each department/unit listed. Attach additional page(s) if necessary. *See online instructions.

Department/Unit:

CHEME

Chair/Program Director:

Date:

1/3/11

Department/Unit:

Chair/Program Director

Date:

CATALOG COPY

Catalog Copy as currently written. Include only sections/paragraphs that would be changed if your request is approved. Please cross out or otherwise highlight any deletions.

See attached.

PROPOSED CATALOG COPY

Reflecting requested changes (Include exact wording as you wish it to be shown in the printed catalog. Please underline or otherwise highlight any additions. If needed, attach a separate, expanded version of the changes that might appear in department publications).
Please note: all copy will be edited to reflect uniform style in the General Catalog.

See attached.

APPROVALS

Chair/Program Director:

[Signature]

Date: 1/3/11

College/School/Campus Curriculum Committee:

Robert E. Bridenthal

Date: 1/18/11

Dean/Vice Chancellor:

Evelyn Koon

Date: 1/20/11

Faculty Council on Academic Standards/ General Faculty Organization/Faculty Assembly Chair:

John Schaeferberger

Date: 2/9/2011

POST TRI-CAMPUS APPROVAL (when needed)

Faculty Council on Academic Standards/ General Faculty Organization/Faculty Assembly Chair:

John Schaeferberger

Date: 4/11/2011

Current:

Bachelor of Science in Materials Science and Engineering

Suggested First- and Second-Year College Courses: MATH 124, MATH 125, MATH 126; PHYS 121, PHYS 122, PHYS 123; CHEM 142 (or CHEM 144), CHEM 152 (or CHEM 154); English composition; CSE 142; MSE 170; A A 210; CEE 220; HCDE 231.

Department Admission Requirements

Applicants are considered in three groups - Direct Freshman Admission, Early Admission, and Upper-Division Admission. Admission is competitive. Completion of minimum requirements described below does not guarantee admission. All applicants have the right to appeal the department's admission decision. Application information is available from the department adviser.

Direct Freshman Admission

1. Open to freshman students formally admitted to the UW.
2. High school GPA of 3.70 or higher; SAT (or equivalent) scores of 1300 or higher.
3. Indication on the application that Materials Science and Engineering is the first choice for the major.

Early Admission

1. *Course requirements:* MATH 124, MATH 125, MATH 126; 10 credits of physical science at the level of PHYS 121, PHYS 122, PHYS 123, or CHEM 142 (or CHEM 144), CHEM 152 (or CHEM 154), or above; 5 credits of English composition. All courses must be completed prior to the July 1 application deadline. (HCDE 231 and M E 123 must be taken no later than the academic year of admission.)
2. Applicants must be currently enrolled at the UW and must have completed a minimum of 15 credits taken in residence at the UW. Applications are accepted for autumn quarter only. Application deadline is July 1.
3. *Grade requirements:* Minimum 2.0 grade in each course required for admission and minimum 2.50 cumulative GPA for all courses required for admission.

Upper-Division Admission

1. *Course requirements:* MATH 124, MATH 125, MATH 126, MATH 307; PHYS 121, PHYS 122; CHEM 142 (or CHEM 144), CHEM 152 (or CHEM 154); CSE 142 or AMATH 301; MSE 170; 5 credits of English composition.
2. 64 credits completed by application deadline. Applications are accepted for autumn quarter (July 1 deadline) and spring quarter (February 1 deadline).

3. *Grade requirements*: Minimum 2.0 grade in each course required for admission and minimum 2.50 cumulative GPA for all courses required for admission.

Students may also declare into the Materials Science and Engineering degree program through the College of Engineering Advanced Admission program (see the College of Engineering section for Advanced Admission entrance and continuation requirements).

Graduation Requirements

Minimum 180 credits to include:

General Education Requirements (91-96 credits)

1. *Written and Oral Communications*: 12 credits, to include one 5-credit English composition course from the University list; HCDE 231; HCDE 333 (or department-approved alternative).
2. *Visual, Literary, & Performing Arts (VLPA), and Individuals & Societies (I&S) (24 credits)*: A minimum of 10 credits is required in each area.
3. *Natural World (55-60 credits)*:
 - a. *Mathematics (24-25 credits)*: MATH 124, MATH 125, MATH 126, MATH 307, MATH 308 (or MATH 318); one from MATH 309, MATH 324, IND E 315, or STAT 390
 - b. *Science (31-35 credits)*: CHEM 142 (or CHEM 144), CHEM 152 (or CHEM 154); PHYS 121, PHYS 122, PHYS 123; two additional natural science courses from the department's approved list.

Major Requirements (89-90 credits)

1. *Engineering Fundamentals (24 credits)*: CSE 142 or AMATH 301, MSE 170, A A 210, CEE 220; two of the following: E E 215, M E 123, ~~CHEM E 260/A A 260~~ or CHEM E 325, IND E 250, CHEM E 220.
2. *Materials Science and Engineering Core (49-50 credits)*: MSE 310, MSE 311, MSE 312, MSE 313, MSE 321, MSE 322, MSE 331, MSE 333, MSE 342, MSE 351, MSE 352, MSE 362, MSE 431, MSE 442, MSE 491, MSE 492, MSE 499
3. *Technical Electives (16 credits)*: See department advising office for list of acceptable courses.
4. *Grade Requirement*: Minimum 2.00 departmental cumulative GPA.

Proposed:

Bachelor of Science in Materials Science and Engineering

Suggested First- and Second-Year College Courses: MATH 124, MATH 125, MATH 126; PHYS 121, PHYS 122, PHYS 123; CHEM 142 (or CHEM 144), CHEM 152 (or CHEM 154); English composition; CSE 142 or AMATH 301; MSE 170.

Department Admission Requirements

Applicants are considered in three groups - Direct Freshman Admission, Early Admission, and Upper-Division Admission. Admission is competitive. Completion of minimum requirements described below does not guarantee admission. All applicants have the right to appeal the department's admission decision. Application information is available from the department adviser.

Nanoscience and Molecular Engineering Option (NME): Admission to the NME option for MSE majors is by self-selection and normally occurs upon completion of NME 220, all MSE prerequisites, and formal admission to the MSE Department. A small number of students may be admitted into the NME option upon application to the department. Admission is based on the student's academic record, including grades in NME 220 and any MSE courses already taken and on prior experience/work in the field of nanoscience and/or molecular engineering. Students applying for the NME option should indicate that interest in the Materials Science and Engineering application and discuss their interests and background in the essay.

Direct Freshman Admission

1. Open to freshman students formally admitted to the UW.
2. High school GPA of 3.70 or higher; SAT (or equivalent) scores of 1300 or higher.
3. Indication on the application that Materials Science and Engineering is the first choice for the major.

Early Admission

1. *Course requirements:* MATH 124, MATH 125, MATH 126; 10 credits of physical science at the level of PHYS 121, PHYS 122, PHYS 123, or CHEM 142 (or CHEM 144), CHEM 152 (or CHEM 154), or above; 5 credits of English composition. All courses must be completed prior to the July 1 application deadline. (HCDE 231 and M E 123 must be taken no later than the academic year of admission.)
2. Applicants must be currently enrolled at the UW and must have completed a minimum of 15 credits taken in residence at the UW. Applications are accepted for autumn quarter only. Application deadline is July 1.

3. *Grade requirements:* Minimum 2.0 grade in each course required for admission and minimum 2.50 cumulative GPA for all courses required for admission.

Upper-Division Admission

1. *Course requirements:* MATH 124, MATH 125, MATH 126, MATH 307; PHYS 121, PHYS 122; CHEM 142 (or CHEM 144), CHEM 152 (or CHEM 154); CSE 142 or AMATH 301; MSE 170; 5 credits of English composition.
2. 64 credits completed by application deadline. Applications are accepted for autumn quarter (July 1 deadline) and spring quarter (February 1 deadline).
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Students may also declare into the Materials Science and Engineering degree program through the College of Engineering Advanced Admission program (see the [College of Engineering](#) section for Advanced Admission entrance and continuation requirements).

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2. *Visual, Literary, & Performing Arts (VLPA), and Individuals & Societies (I&S) (24 credits):* A minimum of 10 credits is required in each area.
3. *Natural World (55-60 credits):*
 - a. *Mathematics (24-25 credits):* MATH 124, MATH 125, MATH 126, MATH 307, MATH 308 (or MATH 318); one from MATH 309, MATH 324, IND E 315, or STAT 390
 - b. *Science (31-35 credits):* CHEM 142 (or CHEM 144), CHEM 152 (or CHEM 154); PHYS 121, PHYS 122, PHYS 123; two additional natural science courses from the department's approved list.

Major Requirements (89-90 credits)

1. *Engineering Fundamentals (24 credits):* CSE 142 or AMATH 301, MSE 170, A A 210, CEE 220; two of the following: E E 215, M E 123, A A 260 or CHEM E 325, IND E 250, CHEM E 220.
2. *Materials Science and Engineering Core (49 credits):* MSE 310, MSE 311, MSE 312, MSE 313, MSE 321, MSE 322, MSE 331, MSE 333, MSE 342, MSE 351, MSE 352, MSE 362, MSE 431, MSE 442, MSE 491, MSE 492, MSE 499

3. *Technical Electives (16 credits)*: See department advising office for list of acceptable courses.
4. *Grade Requirement*: Minimum 2.00 departmental cumulative GPA.

Nanoscience and Molecular Engineering Option Requirements (92-96 credits)

1. *Engineering Fundamentals (24 credits)*: CSE 142 or AMATH 301, MSE 170, A A 210, CEE 220; two of the following: E E 215, M E 123, A A 260 or CHEM E 325, IND E 250, CHEM E 220.
2. *Materials Science and Engineering Core (49 credits)*: MSE 310, MSE 311, MSE 312, MSE 313, MSE 321, MSE 322, MSE 331, MSE 333, MSE 342, MSE 351, MSE 352, MSE 362, MSE 431, MSE 442, MSE 491, MSE 492, MSE 499 (The senior project (MSE 499) must be in an NME area.)
3. *Nanoscience and Molecular Engineering Courses (20 credits)*: NME 220, NME 221, NME 321, NME 421; additional approved nanoscience and molecular engineering electives to reach 20 credits. See adviser for list of approved electives.
4. *Grade Requirement*: Minimum 2.00 departmental cumulative GPA.

NME/MSE OPTION, Core Courses, required of all MSE majors completing NME/MSE Option

NME 220: Introduction to Molecular Engineering Principles (4 cr.), Spr

NME 221: Nanoscience and Molecular Engineering Seminar I (1 cr.), Spr

NME 321: Nanoscience and Molecular Engineering Seminar II (1 cr.), Spr

NME 421: Nanoscience and Molecular Engineering Seminar III (1 cr.), Spr

NME Elective Courses

The following lists the courses from which MSE/NME Option students can choose three to fulfill the NME/MSE Option and technical electives requirements. Faculty may require additional work directly related to nanoscience and molecular engineering in these courses.

MSE 452 (3): Functional Properties of Materials 2

MSE 462 (4): Mechanical Behavior of Materials 2

MSE 471 (3): Intro to Polymer Science and Engineering

MSE 473 (4): Noncrystalline State

MSE 475 (4): Introduction to Composite Materials

MSE 481 (3): Science and Technology of Nanostructures

MSE/CHEM 484 (3): Materials Chemistry

MSE/ME/EE 486 (3): Fundamentals of Integrated Circuit Technology

BIOEN/CHEM E 490 (3): Engineering Materials for Biomedical Applications

BIOEN/CHEM E 491 (3): Controlled-Release Systems: Principles and Applications

BIOEN 492/CHEM E 458 (3): Surface Analysis

CHEME 455 (3): Surface and Colloid Science Laboratory

CHEM E 554 (3): Nanoscience I—Contact Mechanics and Rheology

NME 498 (4): Special Topics, Nanoscience and Molecular Engineering

NME Hands-on Coursework

At least 3 credit of hands-on NME experience prior to NME 421 (offered in Spring) shall be required to fulfill the MSE Departmental NME Option since students are required to present their work in this seminar. The hands-on experience can be 3 cr. from MSE 499 and/or additional credits from one other 400-level MSE course.

NME/MSE Option—Possible Scenario for Core and Hands-on Electives

Sophomore Year: NME 220 (Spring-4 cr.) and NME 221 (Spring-1 cr.)

Junior Year: NME 321 (Spring-1 cr.)

(optional co-operative experience, 2 cr. max.)

Senior Year: NME 421 (Spring-1 cr.), MSE 499 (senior project and presentation; 4-5 cr.), three NME/MSE 400-level electives—MSE 452, 462, 471, 481, 484, 486 (3-4 cr.), or other NME/MSE elective courses above.

Tri-Campus Review Comments:

Seattle: Option in Nanoscience and Molecular Engineering within the Bachelor of Science in Materials Science and Engineering degree (MSE-20101208)

yagerp
PAUL YAGER

This program seems great, and is probably needed at UW. I'm just curious how this will relate to the planned undergraduate cross-departmental program in Molecular Engineering.. Has anyone discussed that?

uwcr
uwcr
Board owner

On 2/12/2011 5:21 PM yagerp said:

This program seems great, and is probably needed at UW. I'm just curious how this will relate to the planned undergraduate cross-departmental program in Molecular Engineering.. Has anyone discussed that?

Paul,

The options in NME as already approved by CHEM E, in the process for MSE, and soon to be proposed by BIOEN - are being implemented because originally the plan was to offer an NME minor and it was discovered that it would be hard to impossible for most engineering students to complete the minor with the major/minor credit overlap restrictions FCAS requires. I have not seen a proposal for a new undergraduate Molecular Engineering degree proposal yet, so it is a minimum of 18 months-2 years out.

These options would allow current students to have NME on their transcripts.

Jennifer Payne, M.Ed.
University Curriculum Coordinator

UNIVERSITY CAMPUSES UNDERGRADUATE PROGRAM REVIEW PROCEDURES**

CHECKLIST

Title of Proposal: *Option in Nanoscience and Molecular Engineering within the Bachelor of Science in Materials Science and Engineering degree.*

Proposed by (unit name): **Materials Science and Engineering**

Originating Campus:

UW, Seattle

UW, Bothell

UW, Tacoma

I. Phase I. Developed Proposal Review (to be completed by Originating Campus' Academic Program Review body)

A. Review Completed by: (list name of program review body)

Chaired by:

02/09/11 Date proposal received by originating campus's review body

02/12/11 Date proposal sent to University Registrar

02/12/11 Date proposal posted & email sent to standard notification list

04/01/11 Date of originating campus's curriculum body approval

(Note: this date must be 15 business days or more following date of posting)

B. 1 Number of comments received. Attach the comments and a summary of the consideration and responses thereof : (1-2 paragraphs) (second comment is response)

II. Phase II. Final Proposal Review (to be completed by FCTCP)

A. Review Completed by:

FCTCP subcommittee

FCTCP full council

Chaired by: Steve Holland Final Approval from FCTCP Chair – William Erdly

4/06/2011 Date request for review received from University Registrar

4/25/2011 Date of FCTCP report

B. Review (attached)

YES NO

___ Was notice of proposal posted on UW Website for 15 business days?

___ Was notice of proposal sent to standard mailing list 15 business days in advance of academic program review?

___ Were comments received by academic program review body?

___ Was response to comments appropriate? (explain, if necessary)

___ Was final proposal reviewed by FCTCP within 14 days of receipt?

Note: Slight delay due to change in subcommittee membership and several members were out of town.

___ Was there adherence to the University Campuses Undergraduate Program Review Process? (explain, if necessary)

C. Recommendation

___ Forward for final approval

___ Forward to Provost because of University issues (Explain)

___ Return to campus council because of insufficient review (Explain).

**Endorsed by Faculty Senate Executive Committee, 1/10/05, modified 1/31/06; These procedures apply to new undergraduate degrees, majors, minors (and certificates) and substantive changes to same