A named option is a formally documented sub-major within an academic major program. Named options serve as a convenient way to distinguish a distinct curriculum or delivery format within a major. A named option is NOT a new degree or major. Authorization by the Board of Regents to deliver an academic program is at the degree/major level.

This form is to be used in concert with the Policy Guidelines for Named Options within Academic Majors. Complete the form and save as a Microsoft Word document.

1. Overview
1.1. Named Option: Nanomaterials and Nanoengineering
1.2. Academic Major: M.S. Materials Science and Engineering
1.3. Home Department: Materials Science and Engineering
1.4. School/college: Engineering, College of
1.5. Partner department(s)/units/schools/colleges: none
1.6. Chair of the Major (name, title, email): Paul Voyles, Chair, chair@mse.wisc.edu
1.7. Primary faculty or staff contact for the proposal (name, title, email): Xudong Wang, Associate Chair for Graduate Studies, acgs@mse.wisc.edu
1.8. Primary school/college dean’s office contact (name, title, email): James Blanchard, Executive Associate Dean, jake.blanchard@wisc.edu
1.9. Briefly describe the type and purpose of the named option.
This will be a non-pooled tuition revenue program for a Master of Science degree in Materials Science and Engineering. The option will provide more specificity to the credential and will thus be more attractive to students interested in studying nanomaterials and nanoengineering, a sub-discipline of Materials Science and Engineering. This approach will allow us to recruit from a broader audience interested in terminal Masters degrees and thus increase our graduate enrollment. The program has been designed as a 12-month, course-only, terminal program.
What prints on the diploma: Master of Science-Materials Science and Engineering
What prints on the transcript: Master of Science-Materials Science and Engineering, Named Option: Nanomaterials and Nanoengineering

Named option types are described in the Policy Guidelines for Named Options within Academic Majors: 1. Area of curricular emphasis within the major for undergraduate programs; 2. Honors in the major for undergraduate programs; 3. Area of curricular emphasis within the major for graduate programs; 4. Non-pooled tuition revenue programs; 5. Distance/Online Programs; 6. Off-Campus Location for graduate, professional, or undergraduate programs

1.10. Date form completed: 9/26/2017
2. Approval Implementation and Expectations for Review
   2.1. School/College Approval Date: 10/18/2017
   2.2. GFEC Approval Date (graduate level named options only):
   2.3. UAPC Approval Date:
   2.4. Expected first term of student enrollment (typically the first fall after UAPC approval): Type first term of enrollment here.
   2.5. Year of three year progress report to GFEC (3 years after first student enrollment; graduate level named options only): 2021
   2.6. Year of first program review (5 years after first student enrollment): 2023
   2.7. Are all academic programs in the home department up to date for program review? Yes
   APIR will provide a list of programs and most recent review date if needed.
   If no, program reviews need to be completed before a new proposal is advanced at campus level (GFEC and UAPC). Please provide and information related to plans for completion of program reviews:
   Type an explanation here. (1000 word limit)

3. Background/Rationale
   3.1. How does the named option relate to the major and to other named options in the major, if relevant?
   Nanomaterials and Nanoengineering is one of the major sub-disciplines of Materials Science and Engineering. Hence, it is complementary to our research-focused programs, but has a more practical focus (given the accelerated timetable and lack of a thesis). There is no other named option offered by the College of Engineering in the area of nanoscale materials. Hence, this option is not expected to compete for students with other option programs.
   3.2. What is the purpose of the named option? How does the named option contribute to the mission of the sponsoring unit?
   The purpose of the named option is to provide a master of science – Materials Science and Engineering program that is course-based and accelerated (students should finish in one calendar year). The named option contributes significantly to the mission of the Department of Materials Science and Engineering by increasing the number of master-level graduate students and enhancing the reputation of the Department and UW-Madison internationally.
   3.3. What is the evidence that there is a student demand for the named option?
   Nanomaterials and nanoeoengineering are are part of a rapidly expanding industrial segment. According the NSF-funded National Nanotechnology Initiative, up to 1 million jobs in nanotechnology are expected to be available in the US. The Materials Science and Engineering Department cannot currently accommodate all of the qualified students interested in advance study in nanotechnology in our research-based Masters and doctoral programs. Examination of our graduate applicant pool from last year easily identified 10 students who would be well-served by this new program.

4. Curriculum
   4.1. Delivery modality:
   Face-to-face
Distance-delivered programs are those programs in which 50% or more of the required courses may be taken as distance-delivered courses. If the option is intended to provide a way to distinguish between students in a face-to-face or an online/distance delivered program, the provide information on how the distance program is developed and supported in 10.1.

4.2. Provide a complete list of named option requirements.
Students are required to complete 30 credits of course works in Nanomaterials and Nanoengineering
Program requirements should provide content that leads to the completion of major learning goals. See section 5 Assessment.

4.3. ☒ Attach a full curriculum including all required and elective courses.
4.4. ☐ For undergraduate named options, attach a four year roadmap.
Named options for undergraduate majors will have requirements totaling 120 credits and students should be able to complete the degree/major within four academic years.

4.5. ☒ For graduate named options, attach a chart outlining minimum degree requirements and elements for satisfactory progress.
Master's level programs will include at least 30 credits of requirements. Doctoral level programs will include at least 51 credits of requirements.

Checklist for Verification of Curricular Policy Requirements *
You will have an opportunity to provide explanation and rationale for any Curricular Policy Requirements that have not been affirmed in the text box that follows the check list, below.
☒ Courses are offered on a regular basis.
☒ Courses have enrollment capacity for students in the named option.
☒ All courses required for the named option are fully approved.
☒ Units must maintain Named Option requirements so that they are up-to-date; all curriculum changes must be approved through the appropriate school/college academic planning council (APC) or curriculum committee. The school/college APC or curriculum committee will notify the Office of the Registrar and the Graduate School (graduate level named options only) about approved curricular changes to the named option. Typically, any changes in requirements will be effective no sooner than the fall semester after approval.

*Provide explanation and rationale for any Curricular Policy Requirements that have not been affirmed.
Provide explanation for Curricular Policy Requirements that have not been affirmed here.

5. Assessment
5.1. ☒ Attach a program assessment plan when submitting this proposal.
Assessment plans for a named option should be integrated with the assessment plan for the major. See the Basic Assessment Plan for instruction and accompanying template. The Basic Assessment Plan and Template are minimum expectations for this information. Programs that have developed plans that exceed what is specified in the basic plan may provide that information.
5.2. Provide a summary of the program assessment plan, including learning goals for the major and any additional learning goals that are specific for the named option, key methods and assessment approaches, and how assessment information will be reviewed and acted on.

1. Demonstrate a strong understanding of mathematical, scientific, and engineering principles in the field
2. Demonstrate an ability to formulate, analyze, and independently solve advanced engineering problems
3. Demonstrate creative, independent problem solving skills
4. Apply the relevant scientific and technological advancements, techniques, and engineering tools to address these problems
5. Recognize and apply principles of ethical and professional conduct

Method for assessing learning:
The student's academic advisor will collect their advisees' course work performance and complete the College's learning goals checklist before the end of the semester in which the research/project/independent study was completed.

Plan for review of the assessment information:
The Associate Chair for Graduate Studies will provide assessment updates, lead the discussion and review the assessment data at a faculty meeting once a year and report the program assessment results – both the data summary and any recommendations -- to the Dean's Office. The Dean's Office will present all program assessment reports to the College Academic Planning Council (APC).

The assessment summary should highlight how the named option is included in the overall assessment plan for the major. The named option must adhere to all learning goals for the major and may also have additional learning goals that are specific for the named option.

6. Overlap and Related Programs
6.1. Specify any other degree/majors, named options, or certificates that may not be earned in combination with this named option.
Students will not be permitted to earn any other named option offered by MS&E. Students will also not be allowed to earn this named option and the related MS degree (MS MS&E) with no option.
Overlap restrictions must be managed at the program level as part of the advising process.
When proposing a named option that has the same name as an existing degree/major certificate or doctoral minor at the same level, the program will be required to put in place processes to ensure that students do not enroll in both programs with the same name. If the program faculty choose to limit any other overlap with other degree/majors, named options, or certificates a list must be specified in the proposal and the program faculty/staff will be responsible for monitoring and enforcing overlap limits.

7. Admissions & Enrollment
7.1. For graduate programs proposing a named option with admissions requirements that are distinct from the major with no named option, explain the admissions criteria and process.
The same admissions criteria will be used for both the named option and the major, with the exception of English language proficiency. The named option will admit students that meet the minimum English language proficiency requirements of the graduate school, but will not allow
lower scores. Essentially, no students will be admitted that may require ESL courses, as the additional course load is problematic and summer entry will not allow for ESL enrollment. The Materials Science and Engineering Department will make the final decision on all admissions to the option.

7.2. What is the projected annual enrollment in the named option? Initially 5 in this option, with the expectation that the option enrollment will grow to approximately 20 students per year

7.3. What is the maximum enrollment (using existing instructional and student resources)? 20

7.4. What are the contingency plans for supporting enrollments higher than the stated maximum enrollment? The first 10 students can be supported with current capacity (other than the need for additional administrative support) and beyond that additional TA’s will be hired to support the additional students. At some point, we would need to add additional sections to some courses and, at that point, we would support additional faculty associates using revenue from this program. It is difficult to predict the enrollment that might trigger this, but one could imagine it being on the order of 40 students for this option.

Checklist for Verification of Admission Policy Requirements for Undergraduate Named Options*

You will have an opportunity to provide explanation and rationale for any Admission Policy Requirements that have not been affirmed in the text box that follows the checklist.

☒ Named option admission requirements are consistent with admission requirements for the major with no named option, if the major has any admission requirements beyond admission to the University. Admission limits should be related to interest or aptitude for the content and not based solely on a high GPA cutoff

☐ The named option will be declared and canceled using the e-Declaration process in the student information system.

☐ Undergraduates will not be advised to declare or remain enrolled in a named option if it will extend their time to graduation. Undergraduate students are to be discouraged from earning more than one named option that represents an area of curricular emphasis within the major.

*Provide explanation and rationale for any Admission Policy Requirements that have not been affirmed in the above checklist.

Type explanations for Admission Policy Requirements not affirmed here.

8. Advising

8.1. List name(s) of major and named option advisor(s) with title and departmental affiliation(s).

Major: Materials Science and Engineering

Named option advisors: Padma Gopalan, Jason Kawasaki, Max Lagally, Xudong Wang

8.2. Describe how there will be sufficient advising and academic support for all students in the major (both the existing major’s students and the new students that will be served by the named option).

The Materials Science and Engineering department has 15.25 FTE faculty. A rotating subset of those faculty assigned to the Graduate Affairs departmental subcommittee, typically including the Associate Chair for Graduate Studies and three other faculty will provide advising. As the program grows, the Graduate Affairs committee roster will grow to maintain an approximately constant advising burden on faculty.

8.3. ☒ Confirm that major and named option advisor(s) have been consulted and reviewed this proposal.
9. Governance & Faculty

9.1. ☒ The named option must be governed by the same department or academic unit that oversees the major. Any sub-committee governing the named option must report to the faculty governance committee for the major.

9.1.1. If a sub-committee governs the named option, describe procedures including how faculty are identified and provisions for transitions in the committee.

N/A

9.2. List core faculty and staff with title and departmental affiliation(s).

Michael Arnold, Professor, MS&E
Susan Babcock, Professor, MS&E
Chang-Beom Eom, Professor, MS&E
Paul Evans, Professor, MS&E
Padma Gopalan, Professor, MS&E
Jiamian Hu, Assistant Professor, MS&E
Jason Kawasaki, Assistant Professor, MS&E
Sindo Kou, Professor, MS&E
Max Lagally, Professor, MS&E
Roderick Lakes, Professor, MS&E and Engineering Physics
Dane Morgan, Professor, MS&E
John Perepezko, Professor, MS&E
Donald Stone, Professor, MS&E
Izabela Szlufarska, Professor, MS&E
Paul Voyles, Professor, MS&E
Xudong Wang, Professor, MS&E

10. Fiscal Structure and Ongoing Commitment

10.1. Provide an overview of plans for funding the named option including but not limited to program administration, instructional/curricular delivery, technology needs, and program assessment.

All expenses will be covered by program revenue. Since the program is delivered in a face-to-face format, the differential costs related to delivery and technology are minimal and difficult to quantify. Assessment will be addressed within Materials Science and Engineering using the same processes to be employed for existing majors. These processes are being developed now.

10.2. How will the named option impact staffing needs beyond the immediate program? How are those needs being met?

The College of Engineering has added two full time staff members to assist with admissions and administration of named option programs. These are shared across several named options, so the costs to each individual program will be modest. Additional TAs and graders may be required to assist with individual courses. In some cases, new courses will be created and those costs will be born by the program. This will require sufficient enrollment to justify the costs and will not occur within the first few years. As staffing needs grow to support enrollment, tuition revenue will be used to fund that staff expansion.

If there is no change in staffing, please describe how the duties of current employees will evolve to support this named option.

10.3. For named options supported using non-pooled tuition, provide a fiscal annual summary including planned enrollment, estimated paid tuition, instructional costs, and estimated excess
tution available for reinvestment in keeping with the separate guidelines for non-pooled programs.
See attached

10.4. For graduate programs supported using pooled tuition, provide a plan for how new graduate students will be funded.
N/A

**Required attachments**
- ☐ Cover letter from the Dean of the school/college that will be the home of the named option
  *When a proposal for a new named option is forwarded for approval, it will have a cover letter to the provost from the supporting dean.*
- ☐ Supporting letters/memos
  *Proposals must be accompanied by letters or memos submitted by the chair or director of other academic units that have overlapping interest. These notes may comment on shared resources, competition for students or other ways in which the programs will interact surrounding the named option. This will include departments/schools/colleges, share a student audience, represent a closely related area of study, have overlapping faculty, or have program names that are similar.*
- ☒ Full curriculum including all required and elective courses
- ☐ For undergraduate named options, attach a four year roadmap.
- ☒ For graduate named options, attach a chart outlining minimum degree requirements and elements for satisfactory progress.
- ☒ Assessment plan

Named options supported using non-pooled tuition must attach:
- ☒ Core Criteria Checklist
- ☒ Additional Requirements Checklist

*See the current Non-pooled Program Requirements Process document posted at [https://kb.wisc.edu/vesta/page.php?id=59300](https://kb.wisc.edu/vesta/page.php?id=59300)*
Curriculum for UW Master of Science Degree Program
Department of Materials Science and Engineering

Credits Requirement: 30

Suggested Course Credit Allocation:

- Summer Session 4 Credits
- Fall Semester 13 Credits
- Spring Semester 13 Credits

Degree/Major: M.S. Materials Science and Engineering

Named Option: Nanomaterials and Nanoengineering
Proposed Curriculum for Department of Materials Science and Engineering

Named Option: Nanomaterials and Nanoengineering

Course Requirements:
- 30 total credits
- MSE 350: Introduction to Materials Science, taken during first semester of enrollment (3 cr).
- MSE 900: Materials Research Seminar in both of the Fall and Spring semesters (1 cr. each, 2 cr. total)
- MSE 553: Nanomaterials and Nanotechnology (3 cr.)
- A minimum of 22 additional credits from the courses listed below.
  - At least 9 credits of the additional coursework must be at the graduate level.
  - At most 6 credits of MSE 601: Independent Study may be taken.

**Fall course offerings:**

- MS&E 401  Special Topics (by instructor consent)  1-3 cr.
- MS&E 434  Introduction to Thin-Film Deposition Processes  3 cr.
- MS&E 448  Crystallography and X-Ray Diffraction  3 cr.
- MS&E 456  Electronic, Optical, and Magnetic Properties of Materials  3 cr.
- MS&E 521  Advanced Polymer Materials  3 cr.
- MS&E 530  Thermodynamics of Solids  3 cr.
- MS&E 570  Properties of Solid Surfaces  3 cr.
- MS&E 752  Advanced Materials Science: Phase Transformations  3 cr.
- MS&E 756  Structure and Properties of Advanced Electronic Materials  3 cr.
- MS&E 601  Independent Study  1-3 cr.
- MS&E 803  Special Topics in Materials Science (by instructor consent)  1-3 cr.

**Spring course offerings:**

- MS&E 401  Special Topics (by instructor consent)  1-3 cr.
- MS&E 421  Polymeric Materials  3 cr.
- MS&E 551  Structure of Materials  3 cr.
- MS&E 553  Nanomaterials and Nanotechnology  3 cr.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS&amp;E 560</td>
<td>Fundamentals of Atomistic Modeling</td>
<td>3 cr.</td>
</tr>
<tr>
<td>MS&amp;E 601</td>
<td>Independent Study</td>
<td>1-3 cr.</td>
</tr>
<tr>
<td>MS&amp;E 748</td>
<td>Structural Analysis of Materials</td>
<td>3 cr.</td>
</tr>
<tr>
<td>MS&amp;E 760</td>
<td>Molecular Dynamics and Monte Carlo Simulations in Materials Science</td>
<td>3 cr.</td>
</tr>
<tr>
<td>MS&amp;E 803</td>
<td>Special Topics in Materials Science (by instructor consent)</td>
<td>1-3 cr.</td>
</tr>
</tbody>
</table>

**Summer course offerings:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS&amp;E 350</td>
<td>Introduction to Materials Science</td>
<td>3 cr.</td>
</tr>
<tr>
<td>MS&amp;E 601</td>
<td>Independent Study</td>
<td>1-3 cr.</td>
</tr>
</tbody>
</table>

## Example Course Schedules

### Example 1: Starting in a Fall semester

**Fall semester:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 350: Introduction to Materials Science</td>
<td>3 cr</td>
</tr>
<tr>
<td>MSE 900: Materials Research Seminar</td>
<td>1 cr</td>
</tr>
<tr>
<td>Selected course #1</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #2</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #3</td>
<td>3 cr</td>
</tr>
<tr>
<td><strong>Total credits</strong></td>
<td><strong>13 cr</strong></td>
</tr>
</tbody>
</table>

**Spring semester:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 900: Materials Research Seminar</td>
<td>1 cr</td>
</tr>
<tr>
<td>MSE 553: Nanomaterials and Nanotechnology</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #4</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #5</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #6</td>
<td>3 cr</td>
</tr>
<tr>
<td><strong>Total credits</strong></td>
<td><strong>13 cr</strong></td>
</tr>
</tbody>
</table>

**Summer term:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 601: Independent Study</td>
<td>4 cr</td>
</tr>
<tr>
<td><strong>Total credits</strong></td>
<td><strong>4 cr</strong></td>
</tr>
</tbody>
</table>

### Example 2: Starting in a Summer semester

**Summer term:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 350: Introduction to Materials Research</td>
<td>3 cr</td>
</tr>
<tr>
<td>MSE 601: Independent Study</td>
<td>4 cr</td>
</tr>
<tr>
<td><strong>Total credits</strong></td>
<td><strong>7 cr</strong></td>
</tr>
</tbody>
</table>

**Fall semester:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 900: Materials Research Seminar</td>
<td>1 cr</td>
</tr>
<tr>
<td>Selected course #1</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #2</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #3</td>
<td>3 cr</td>
</tr>
<tr>
<td><strong>Total credits</strong></td>
<td><strong>10 cr</strong></td>
</tr>
</tbody>
</table>
Spring semester:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 900: Materials Research Seminar</td>
<td>1 cr</td>
</tr>
<tr>
<td>MSE 553: Nanomaterials and Nanotechnology</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #4</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #5</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #6</td>
<td>3 cr</td>
</tr>
<tr>
<td>Total credits</td>
<td>13 cr</td>
</tr>
</tbody>
</table>

**Example 3: Continuing UW-Madison MSE undergraduate**

Count credits from undergraduate coursework:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 351: Materials Science – Structure and</td>
<td>3 cr</td>
</tr>
<tr>
<td>Property Relations in Solids</td>
<td></td>
</tr>
<tr>
<td>MSE 330: Thermodynamics of Materials</td>
<td>4 cr</td>
</tr>
<tr>
<td>Total credits</td>
<td>7 cr</td>
</tr>
</tbody>
</table>

Fall semester:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 900: Materials Research Seminar</td>
<td>1 cr</td>
</tr>
<tr>
<td>Selected course #1</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #2</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #3</td>
<td>3 cr</td>
</tr>
<tr>
<td>Total credits</td>
<td>10 cr</td>
</tr>
</tbody>
</table>

Spring semester:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 900: Materials Research Seminar</td>
<td>1 cr</td>
</tr>
<tr>
<td>MSE 553: Nanomaterials and Nanotechnology</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #4</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #5</td>
<td>3 cr</td>
</tr>
<tr>
<td>Selected course #6</td>
<td>3 cr</td>
</tr>
<tr>
<td>Total credits</td>
<td>13 cr</td>
</tr>
</tbody>
</table>
### Materials Science and Engineering

**MINIMUM DEGREE REQUIREMENTS & SATISFACTORY PROGRESS**

*Schools/Colleges, Departments and Programs may set more rigorous expectations and requirements than the Graduate School*

- If describing multiple degree plans at the same level (M.A. and M.S.) or multiple named options and tracks within a plan, indicate requirements for all plan variations.
- Please note that “Example” in the chart provides an example of policy – but is not necessarily reflective of Graduate School’s policy. For the actual Graduate School policies, you may consult the Graduate School Degree Requirements chart at [http://grad.wisc.edu/catalog/degreq_criteria.htm](http://grad.wisc.edu/catalog/degreq_criteria.htm) to ensure program compliance with Graduate School degree requirements.
- If the program policy aligns with Graduate School degree requirements, please reiterate the policy in your program’s degree requirement chart – do not simply provide “Follow Graduate School Policy”.
- Programs are responsible for monitoring more restrictive requirements.

<table>
<thead>
<tr>
<th>Master’s Degrees:</th>
<th>Master of Science, Nanomaterials and Nanoengineering Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Graduate Degree Credit Requirement</td>
<td>30 credits</td>
</tr>
<tr>
<td>Minimum Graduate Residence Credit Requirement</td>
<td>16 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework (50%) Requirement</td>
<td>At least 50% of credits applied towards the graduate degree credit requirement must be in graduate-level coursework</td>
</tr>
<tr>
<td>Prior Coursework Requirements: Graduate Work from Other Institutions</td>
<td>Prior Coursework Requirements: Graduate Work from Other Institutions&lt;br&gt;With program approval, students are allowed to count graduate coursework from other institutions toward the minimum graduate degree credit requirement and the minimum graduate coursework (50%) requirement. No credits from other institutions can be counted toward the minimum graduate residence credit requirement. Course work earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.</td>
</tr>
<tr>
<td>Prior Coursework Requirements: UW-Madison Undergraduate</td>
<td>Prior Coursework Requirements: UW-Madison Undergraduate&lt;br&gt;With program approval, students are allowed to count up to 7 credits numbered 300 or above graduate coursework from UW-Madison taken in excess of undergraduate degree requirements toward the minimum graduate degree credit requirement; if that coursework is numbered 700 or above it may be used to satisfy the minimum graduate coursework (50%) requirement. No credits can be counted toward the minimum graduate residence credit requirements. Course work earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.</td>
</tr>
<tr>
<td>Prior Coursework Requirement: UW-Madison University Special</td>
<td>Prior Coursework Requirements: UW-Madison University Special&lt;br&gt;With program approval and payment of the difference in tuition (between Special and graduate tuition), students are allowed to count</td>
</tr>
</tbody>
</table>
up to 15 credits of coursework numbered 300 or above taken as a UW–Madison Special student toward the minimum graduate residence credit requirement and, the minimum graduate degree credit requirement; if that coursework is numbered 700 or above it may be used to satisfy, and the minimum graduate coursework (50%) requirement.

<table>
<thead>
<tr>
<th>Credits per Term Allowed</th>
<th>15 credits allowed per semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program-Specific Courses Required</td>
<td>No</td>
</tr>
<tr>
<td>Overall Graduate GPA Requirement</td>
<td>3.00</td>
</tr>
<tr>
<td>Other Grade Requirements</td>
<td>The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.</td>
</tr>
</tbody>
</table>
| Probation Policy               | Probability Policy
The Graduate School regularly reviews the record of any student who earned grades of BC, C, D, F, or Incomplete in a graduate course (300 or above), or grade of U in research credits. This review could result in academic probation with a hold on future enrollment or in being suspended from the Graduate School. |
| Advisor / Committee            | Every graduate student is required to have an advisor. An advisor is a faculty member from the major department responsible for providing advice regarding graduate studies. In many cases, an advisor is assigned to incoming students. To ensure that students are making satisfactory progress toward a degree, the Graduate School expects them to meet with their advisor on a regular basis. |
| Assessments and Examinations   | No formal examination required. |
| Time Constraints               | Time Constraints
Master's degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements |
| Language Requirements          | No language requirements. |
Assessment Plan – M.S. Degree Programs in the College of Engineering

Whether program personnel decide to paste information into this template or to utilize a pre-existing document, all bolded items must be included and clearly labeled.

Identifying Information
School/College: College of Engineering
Graduate Degree/Major Program Name: Materials Science and Engineering, Option: Nanomaterials and Nanoengineering
Graduate Degree Level (M.S., M.A., Ph.D., DMA, etc.): M.S.
Faculty Director Contact/Title: Xudong Wang, Associate Chair for Graduate Study
Primary Contact Information: acgs@mse.wisc.edu; 608-890-2667

Student Learning Outcomes (What)
Assessment of graduate-level learning outcomes is one of the many ways in which our campus ensures the integrity of its degrees and the quality of the student experience. List the graduate student learning outcomes for this academic degree program below. Feel free to add rows if the academic degree program has more than five learning outcomes. The student learning outcomes that have been submitted for your academic degree/major program can be found in the Guide.

Student Learning Outcomes

1. Demonstrate a strong understanding of mathematical, scientific, and engineering principles in the field.
2. Demonstrate an ability to formulate, analyze, and solve advanced engineering problems.
3. Demonstrate creative, independent problem solving skills.
4. Apply the latest scientific and technological advancements, advanced techniques, and modern engineering tools to these problems.
5. Recognize and apply principles of ethical and professional conduct.

Plan for Assessing Each Student Learning Outcome
For each of the degree major/program student learning outcomes, indicate how the program plans to assess whether or not students are meeting the expectation, as well as when each learning outcome will be assessed. Keep in mind that each academic degree program is expected to engage in at least one assessment activity per year and assessment activities, in total, must include one direct assessment method. While programs do not need to assess each learning outcome every year, all learning outcomes must be assessed within a period of three years.

<table>
<thead>
<tr>
<th>Assessment Planning (How)</th>
<th>Learning Outcome #1</th>
<th>Learning Outcome #2</th>
<th>Learning Outcome #3</th>
<th>Learning Outcome #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method for assessing learning (at least one direct method required)</td>
<td>The student's academic advisor will collect their advisees' course work performance and complete the College's learning goals checklist before the end of the semester in which the degree is completed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timetable for assessment activity</td>
<td>Annually Data collected at the end of every semester (via the learning goals checklist) will be compiled in aggregate form and reviewed annually.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*For examples of direct and indirect methods of assessment, see the UW Madison Assessment website
You may elect to copy and paste this table multiple times if your program has more than five learning outcomes.

Also provide answers to the following questions as part of your assessment plan.

1. **Who is responsible for assessment?** (identify an individual or team who will coordinate the implementation of the plan on an annual basis):
   The department graduate program coordinator (staff) will remind all faculty members serving as M.S. named option advisors to complete the learning goals checklist at the end of the semester in which the degree is completed. The student's advisor (faculty) is responsible for completing the learning goals checklist and submitting it to the department associate chair for graduate study (ACGS). The ACGS will compile and summarize the department's learning goals assessment data on an annual basis.

2. **What is the plan for review of the assessment information?** (typically during an annual meeting of the program faculty and staff; note that at this meeting the program may want to review enrollment information, course progression, degree completion, and other structural features of the student experience in addition to the evidence about student learning):
   The ACGS will provide assessment updates, lead the discussion and review the assessment date at a faculty meeting once a year and report the program assessment results – both the data summary and any recommendations – to the Dean's Office. The Dean's Office will present all program assessment reports to the College Academic Planning Council (APC).

3. **What is the plan for production of an annual summary report?** (the annual summary report includes the materials that form the basis of discussion at the annual meeting of the program faculty and staff, along with any recommendations made after considering the student learning assessment information presented):
   The Dean's Office will compile an annual College-wide summary report consisting of the individual reports from each CoE graduate program and a brief statement of any additional recommendations provided by the CoE APC.

4. **How will recommendations be implemented?** (explain the general process by which recommendations will be implemented):
   The annual College-wide summary report, including any APC recommendations, will be shared with each ACGS or graduate program assessment coordinator (GPAC) for implementation in individual programs.
**Graduate Degree Program Curriculum Mapping Worksheet (Where)**

This worksheet, or similar document, must be included with the submission of the program’s assessment plan.

- **Learning Outcomes** – Enter the academic degree program learning outcomes identified in the assessment plan on the top row of the following chart. Feel free to add columns if the academic degree/major program has more than five learning outcomes.

- **Degree/Major Program Courses/Experiences** – List all degree requirements (in some cases co-curricular experiences may also be included). Feel free to add rows as needed.

- Indicate with a check (X) where the course or learning experience contributes to each of the learning outcomes. Courses may contribute to multiple learning outcomes.

<table>
<thead>
<tr>
<th>Curriculum Map (Where)</th>
<th>Enter program-level learning outcomes and check (X) which course or experience contributes to which learning outcome.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Degree Program Required Courses or Experiences</strong></td>
<td>Learning Outcome #1</td>
</tr>
<tr>
<td>M.S. coursework</td>
<td></td>
</tr>
<tr>
<td>Research or project experience</td>
<td>X</td>
</tr>
<tr>
<td>Culminating report and/or presentation</td>
<td>X</td>
</tr>
</tbody>
</table>

*Add additional rows as needed to capture all requirements.

Minimally, all of the courses/experiences required to complete the major degree program should be listed. Optionally, elective courses may be included in addition to the required courses.

Please email your program’s Assessment Plan Template and Curriculum Map Worksheet to regina.lowery@wisc.edu by July 1, 2016.

For Undergraduate Degree Program Assessment Plan Template, see the UW Madison Assessment website. [https://assessment.provost.wisc.edu](https://assessment.provost.wisc.edu)
Budget
Master of Science in Materials Science and Engineering
Nanomaterials and Nanoengineering Option

In the first year, this program will only enroll approximately 5 students. Hence, impact on existing programs will be minimal and the differential instructional costs will be minimal. As the program grows in enrollment, we anticipate hiring some additional TAs from the revenue generated by this option to ensure that there is no impact on existing programs. We anticipate needing to add additional some staff and faculty fractional appointments to assist administratively and in an advisory capacity. Some administrative activities will be handled centrally by the College of Engineering, but activities like summer instruction will be funded from program revenue.

Summary Budget

<table>
<thead>
<tr>
<th>Summary Budget</th>
<th>Year 1</th>
<th>Year 2</th>
<th>On-going</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Tuition/Student/Year</td>
<td>$27,000</td>
<td>$27,000</td>
<td>$27,000</td>
</tr>
<tr>
<td>Gross Revenue</td>
<td>$135,000</td>
<td>$270,000</td>
<td>$540,000</td>
</tr>
<tr>
<td><strong>Expenses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University Assessment (10%)</td>
<td>$13,500</td>
<td>$27,000</td>
<td>$54,000</td>
</tr>
<tr>
<td>Engineering College (20%)*</td>
<td>$27,000</td>
<td>$54,000</td>
<td>$108,000</td>
</tr>
<tr>
<td>Additional TA Support</td>
<td>$5,000</td>
<td>$5,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Department Staff Support</td>
<td>$10,000</td>
<td>$10,000</td>
<td>$30,000</td>
</tr>
<tr>
<td>Faculty Support</td>
<td>$15,000</td>
<td>$25,000</td>
<td>$45,000</td>
</tr>
<tr>
<td><strong>Total Expenses</strong></td>
<td>$70,500</td>
<td>$121,000</td>
<td>$247,000</td>
</tr>
<tr>
<td><strong>Net Revenue</strong></td>
<td>$64,500</td>
<td>$149,000</td>
<td>$293,000</td>
</tr>
</tbody>
</table>

*Estimated. Includes centralized administration, student services, marketing and recruitment.
APPENDIX A.  CORE CRITERIA CHECKLIST  
FOR ACADEMIC PROGRAMS WITH NON-POOLED TUITION

1. New and Additional Student Enrollments to Support Program Costs
   ☑ The program must bring in NEW and ADDITIONAL students. Overall enrollment in all other school/college programs must not be eroded. The program cannot compete with or draw students away from existing programs that support the central tuition pool.
   ☑ Faculty/staff must plan for sufficient enrollments to have enough tuition to cover instructional, direct student support costs, and any other fixed or required costs. Experience shows that enrollments of at least 30 students are necessary to have enough tuition to meet direct program costs.
   ☑ School/college Budget Officers must be involved in planning and must approve plans and budgets for these programs before the program is submitted to the school/college APC for academic approval.

2. Designed for Non-Traditional Students
   ☑ Has an applied, practice-oriented curriculum, or integrates practice with theory
   ☑ Is offered in a modality that allows non-traditional audiences to attend (evening, weekend, online, intensive, or some combination)
   ☑ Has demonstrated a workforce demand for the program graduates
   ☑ Has defined learning goals that are oriented to market considerations
   ☑ Has a clearly defined curriculum that is “self-contained”, meaning that program students are confined only to courses from the approved, prescribed curriculum
   ☑ Has a clearly defined (often lockstep) curriculum with few options or electives that follows a predictable timeline for offerings and completion

3. Distinctly Identifiable Program (Code) With Governance Approval
   ☑ The program must be distinctly identifiable in the student record system, either as a degree/major or as an option of a degree/major, or as a Capstone certificate.
   ☑ The program must develop a proposal for the academic approval process, during which it must demonstrate that the school/college Dean and Budget Officer are aware and supportive of the program being run on a non-pooled tuition model.
Appendix B. Additional Requirements Checklist
For Academic Programs With Non-Pooled Tuition

Use this checklist in conjunction with the Core Criteria Checklist

If core criteria are met, the program must adhere to the additional requirements below.
Note: Not all new programs are suited for the non-pooled program requirements. New programs that seek to take advantage of a wide range of course and curricular/program offerings on campus and are not market-oriented should be developed under traditional (101) pooled tuition funding models.

1. Fiscal Requirements:
   - School/college budget officer has approved the budget and fiscal plan.
   - School/college dean and budget officer are committed to assuming fiscal responsibility for costs not covered by non-pooled tuition to the program. The school/college will back up the budget with a commitment to cover any costs not met from tuition from other sources.
   - The program structure fits within standard academic administrative structures and allocates expenses of the program so that the program does not create additional burdens on traditional/101 program resources or student services such as advising, ESL, Registrar’s Office, Bursar’s Office, Graduate School, and other support services.
   - Programs have two options for tuition. One option is to charge standard graduate tuition according to the UW-Madison tuition schedule. This includes standard rates for WI resident, MN, and non-resident students and any compulsory fees that apply. Or, for fully online programs, they have the option of charging all students one of tuition tiers (Appendix D). Although not currently allowed, it is potentially possible in the future the tiered tuition may be available to face-to-face programs.
   - Because students who have graduate assistantships receive tuition waivers, some non-pooled tuition graduate degree programs choose to prohibit students from accepting a graduate assistantship (RA/TA/PA). If a program allows their students to take graduate assistantships, they must forgo the tuition revenue. To ensure full receipt of non-pooled tuition and to counter challenges from students, the program must adhere to the following:
     - The program faculty/staff must disclose this program policy to students in the recommendation of admission letter, program website, program handbook, and program orientation.
     - Please see Appendix E for links and Appendix F for a sample of a specific non-pooled program template for a recommendation of admission letter and a general template for a program handbook. The program faculty/staff must provide details on this and any other program policies the program handbook in at least the following areas: satisfactory progress (good standing) requirements, any ways to return to good standing, and a program grievance process if done does not already exist.
2. Requirements for International Students:

- Programs may not admit students who need ESL services without building sufficient ESL support into their fiscal model, and having an explicit MOU with the ESL provider about funding to support the ESL services.

- Graduate degree/major programs must use Graduate School standards for English Proficiency. Capstone certificates should be designed so that admission requirements ensure that ESL support is not needed.

- If the program is NOT completely online and admits international students, the program is responsible for honoring federal visa regulations related but not limited to: length of stay requirements for visa requests, online course restrictions for visa holders, and waiting for federal program approval (up to a year) if the program represents a new degree type or capstone certificate previously not offered at UW-Madison.

3. Requirements for Program/Course Enrollment:

- Non-pooled tuition program students can only be enrolled in one program at a time; enrollment in a second major, named option, certificate program, or courses beyond the prescribed program curriculum is not permitted. Non-compliance with this requirement will jeopardize the receipt of tuition for a non-pooled program. Regular audits will be conducted to ensure these requirements are met.

- To ensure full receipt of non-pooled program tuition and to counter challenges from students who want to be dually enrolled, the program must adhere to the following:
  - The program must provide information to students about prohibitions on concurrent program enrollment and out-of-program course enrollment. Programs must note this in recruiting materials, in recommendations of admission, on the program website, program handbook, and program orientation.
  - Please see Appendix E for links and Appendix F for language for a specific non-pooled program template for a recommendation of admission letter and a general template for a program handbook. The program faculty/staff must provide details on this and any other program policies in the program handbook in at least following areas: satisfactory progress (good standing) requirements, ways to return to good standing, and a program grievance process if one does not already exist.
  - The program communicates to students each semester prior to course enrollment the expectation that students can enroll only in program courses and not in courses outside the approved, prescribed curriculum.
  - For students who enroll in the non-pooled program and then decide they want to pursue traditional/101 programs that allow dual enrollment, the program must help the student transfer to a different program(s) that allow such activity.