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: Automotive Engineering
   1.2. Academic Major: M.S. Mechanical Engineering
   1.3. Home Department: Mechanical Engineering
   1.4. School/college: Engineering, School of
   1.5. Partner department(s)/units/schools/colleges: none
   1.6. Chair of the Major (name, title, email): Jaal Ghandhi, Chair, jaal.ghandhi@wisc.edu
   1.7. Primary faculty or staff contact for the proposal (name, title, email): Jaal Ghandhi, Professor and Chair, jaal.ghandhi@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 Mechanical Engineering. The option will provide more specificity to the credential and will thus be more attractive to students interested in studying Automotive Engineering, a sub-discipline of Mechanical 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-Mechanical Engineering
       What prints on the transcript: Master of Science-Mechanical Engineering, Named Option: Automotive Engineering
       Major: Mechanical Engineering, Option: Automotive Engineering
   1.10. Date form completed: 9/15/2016

2. **Approval Implementation and Expectations for Review**
   2.1. School/College Approval Date: 10/19/2016
   2.2. GFEC Approval Date (graduate level named options only): Click here to enter a date.
   2.3. UAPC Approval Date: Click here to enter a date.
   2.4. Expected first term of student enrollment (typically the first fall after UAPC approval): Fall 2017
2.5. Year of three year progress report to GFEC (3 years after first student enrollment; graduate
level named options only): 2020
2.6. Year of first program review (5 years after first student enrollment): 2022
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:

3. Background/Rationale
3.1. How does the named option relate to the major and to other named options in the major, if
    relevant?
    Automotive Engineering is one of the major sub-disciplines of Mechanical 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 an MEng in Engine Systems offered by
    the College of Engineering, but this is an online program for practicing engineers. The proposed
    program will be a residential program and the majority of the students will not have begun
    their careers at the time they enter the program. Hence, the two options are not expected to
    compete for students, as the intended audiences are different.

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 – Mechanical 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 Mechanical
    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?
    An MOU was signed between Southeast University (China) and UW-Madison, in which we
    expect an enrollment of 20 students initially in a set of named options in the College of
    Engineering. MOUs are in progress between Tsinghua University (China) and UW-Madison,
    which will provide additional students for the named option in the Department of Mechanical
    Engineering. In subsequent years, enrollment across all named options is expected to grow to
    several hundred students (as compared to our total graduate student population of
    approximately 1,400). In addition to Tsinghua and Southeast Universities, we will recruit
    domestic students interested in 1-year, terminal Masters degrees in Automotive Engineering.

4. Curriculum
4.1. Delivery modality:
    Face-to-face
4.2. Provide a complete list of named option requirements.
    Students are required to complete 30 credits of course works in Automotive Engineering.
    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.

Student Learning Goals:
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 M.S. independent study advisor will review the applicable work (e.g. report and/or presentation) 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 graduate committee will review the assessment data, and report to the department faculty 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 more than one named option offered by ME. Students will also not be allowed to earn this named option and the related MS degree (MS ME) with no option. Finally, students will not be permitted to earn the MEng in Engine Systems.

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. To the extent possible, the College of Engineering plans to centralize the admission of all related programs to enhance efficiency of the process. The Mechanical 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, with the expectation that the option enrollment will grow to at most 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 maximum enrollment is limited by the guided independent study project, which will include some significant laboratory hardware. It will be expensive to duplicate this hardware, so we are considering this to be a hard limit at this time.

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: Mechanical Engineering

Named option advisor(s):

ME Faculty: Jaal Ghandhi, Chris Rutland, David Rothamer, Sage Kokjohn

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 Automotive Engineering Program has 4 faculty who will provide advising. Given that this is a coursework-based program, the advising load is not expected to be high.

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.

9.2. List core faculty and staff with title and departmental affiliation(s).
Core faculty: Jaal Ghandhi, Chris Rutland, David Rothamer, Sage Kokjohn
Department of Mechanical Engineering

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 costs related to delivery and technology are minimal and difficult to quantify. Costs for delivering the summer experience will be born solely by this program. Assessment will be addressed within Mechanical 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?

We envision hiring one or two full time staff members to assist with admissions, advising, and administration of this program. These will be shared across several named options, so the costs to each individual program will be minimal. 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 borne by that program. This will require sufficient enrollment to justify the costs and will not occur within the first year. 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 tuition 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 from 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
Curriculum for Master of Science Degree Program

Department of Mechanical Engineering

M.S. in Mechanical Engineering

Option: Automotive Engineering

Credits Requirement: 30

Suggested Course Credit Allocation:

- Fall Semester 12 Credits
- Spring Semester 12 Credits
- Summer Session 6 Credits

**Graduation Requirement:** At least 3 credits must be from a class at the 700 level or above.

Toward the degree requirement of 30 credits, up to 12 credits can be taken from any 400-level or higher course within the College of Engineering. In addition, at least 15 credits must be at the graduate level.
Proposed Curriculum

Department of Mechanical Engineering Masters of Science

Option: Automotive Engineering

Fall Semester (12 credits) – choose at the minimum two courses from the list below

- ME 469 (3 credits): Internal Combustion Engines (F)
- ME 561 (3 credits): Intermediate Thermodynamics (F)
- ME 569 (3 credits): Applied Combustion (F)
- ME 572 (3 credits): Intermediate Gas Dynamics (F)
- ME 573 (3 credits): Computational Fluid Dynamics (F)
- ME 761 (3 credits): Topics in Thermodynamics (odd years) (F)
- ME 764 (3 credits): Advanced Heat Transfer – Conduction (even years) (F)
- ME 775 (3 credits): Turbulent Heat and Momentum Transfer (every year) (F)

Spring Semester (12 credits) – choose at the minimum two courses from the list below

- ME 461 (3 credits): Thermal Systems Modeling (S)
- ME 466 (3 credits): Air Pollution Effects, Measurements and Control (S)
- ME 563 (3 credits): Intermediate Fluid Dynamics (S)
- ME 564 (3 credits): Heat Transfer (S)
- ME 769 (3 credits): Combustion Processes (odd years) (S)
- ME 774 (3 credits): Chemical Kinetics of Combustion Systems (even years) (S)

Summer (6 credits)

- ME 699 (6 credits): Advanced Independent Study. This guided independent study will include approximately an even mix of engine testing and computational fluid dynamics