

**College of Engineering
Proposal to change the MEng degree assessment practices
December 2017**

The College of Engineering is submitting the present proposal to the Graduate Council to request approval for an alternative summative assessment for all MEng degrees awarded in the college.

Background:

The Master of Engineering (MEng) degree is a separate degree from the *research-intensive* MS degree. It is a *coursework-only* Masters degree offered in all the Schools in the College of Engineering, and is analogous to the degrees offered by many other engineering schools in the US. The requirement for this degree is 45 credits of graduate-level course credits.

The MEng degree is designed for students seeking additional training beyond their baccalaureate before entering the workforce. Some of our professional engineering societies (e.g. ASCE) are even considering making the additional year of coursework a requirement for licensure.

"The exploding body of science and engineering knowledge cannot be accommodated within the context of the traditional four-year baccalaureate degree."

-- Educating the Engineer of 2020, National Academy of Engineering, 2005

As a result of the introduction of to the INTO@OSU program about a decade ago, enrollment in the MEng programs has grown substantially over the last few years and is expected to grow further. Current enrollment in the MEng degree across the college is 252 students, and 157 (65%) of those are INTO/Pathway sourced.

Our peer institutions who offer coursework-only Masters degrees consistently do not require a final oral exam. As an example, we have surveyed the Masters degrees of 16 other universities (peers, aspirational-peers, etc.) offering degrees in Computer Science (currently the program with the highest MEng enrollment). Most of these other schools do not have a final exam. The list of schools, their degrees, and the web pages that describe the requirements are given in the table at the end of this document.

Goal:

The goal of this proposed change is to address issues related to the final oral exam as it is currently conducted, and also to improve the student experience for engineering MEng students. Currently, the exam format is not in line with how students are prepared in their coursework. It is often interpreted by faculty as being similar to a thesis-based exam. It can therefore become a very stressful experience for students, in particular those that are non-native English speakers, as they are not always given clear guidelines as to what to expect during the oral exam, and they have had little opportunity presenting oral narrative prior to the exam. Additionally, the current exam format requires the presence of 3 faculty members, which can be difficult to schedule, and for programs with high MEng numbers, represents a significant time commitment.

Proposal:

The COE proposes the following to both enhance the student experience, and to define an alternative summative assessment for the MEng degree:

To provide a more positive student experience we are developing two new courses that will:

- (1) Offer professional development and career training for Masters students (1 credit), ENGR 550: PROFESSIONAL PREPARATION FOR ENGINEERS (currently under review as CPS #102085, see below for details**), and
- (2) Engage them in a portfolio-developing exercise where they: reflect on their learning, describe how their coursework has addressed each of the graduate learning outcomes, and synthesize the coursework experience (1 credit). This will be taught as a college-wide 500-level course under the ENGR suffix. As part of developing the portfolio course, each School in COE will define and disseminate their program-specific graduate learning objectives. The course will be taught college-wide, likely in Winter or Spring term, but perhaps every term depending on need (in AY14, AY15 and AY16, COE granted 84, 91, and 138 MEng degrees, respectively). Students should view the portfolio exercise as a challenging assignment, an integrating experience and a confidence builder. The portfolios should provide confirmation that they have developed basic competencies for professional practice and additional confidences for future professional development. "The literature refers to portfolios as an excellent tool to assess personal and professional growth, skill development, and instructional goals.it should foster self-assessment, self-motivation, self-respect, and future growth" (Spicuzza, 1996). And the portfolio will be a document they can use when they interview for jobs after graduation as mentioned here:
<https://engineering.dartmouth.edu/careers/students/creating-your-portfolio/>

Alternative summative assessment: The portfolio described under (2), when completed, will serve as the final summative assessment for MEng students, to be graded by two faculty members, with no need to schedule three faculty members into the same time-space continuum for an oral exam. The portfolio exercise will also serve to fulfill the first university level graduate learning outcome for Master level degrees related to "*Conduct research or produce some other form of creative work*" GLO-(a).

The student's major advisor and one additional faculty member from the unit will serve as the student's committee.

- A student shall receive a Pass when the grading committee unanimously grades the portfolio as a Pass.
- In cases where consensus is not reached (one member votes Pass and one member votes No Pass) a third faculty member will serve as a third voter. Two outcomes are then possible: the candidate has passed with one dissenting vote or the candidate has not passed (two or more negative votes).
- In cases where the student has not passed, the committee recommends, by majority vote, that the student's work toward the degree be terminated. Or the committee recommends, by majority vote, that the student be allowed to resubmit a modified written project portfolio, but not before the end of the term in which the written project portfolio was completed.
- No more than two modified written project portfolios are permitted. The process will measure how well the student has achieved all three university-wide GLOs in the same way it is done for traditional summative assessments.

To leave options open in case the ENGR 550: PROFESSIONAL PREPARATION FOR ENGINEERS course for some reason should cease to be offered, we would like to suggest that the courses could be taught as:

- 1) a 2 credit course that addresses both (1) and (2) above
- 2) two 1-credit courses that separate the two topics ((1) and (2)), or
- 3) a 1-credit course that does both.

We propose that the alternative summative assessment would be offered in parallel with the standard final oral exam, such that individual programs can adopt and implement in their own time.

Spicuzza, Frank J., "An Evaluation of Portfolio Assessment: A Student Perspective," Assessment Update, November-December, 1996.

Final assessment for peer institutions who offer coursework-only Masters degrees for Computer Science:

| School | Course-work only Masters degree | Final assessment |
|--|---------------------------------|-----------------------|
| Michigan State University | MS | None |
| Ohio State University | MS | Written comprehensive |
| Columbia University | MS | None |
| University of California, Davis | MS | Oral/written exam |
| Penn State University | MEng | Paper |
| Purdue University | MS | None |
| Stanford University | MS | None |
| University of Illinois, Urbana-Champaign | MCS | None |
| University of Michigan | MS | None |
| Texas A & M University | MCS | None |
| University of Arizona | MS | None |
| University of Wisconsin | MS | None |
| University of Texas | MS | None |
| University of Minnesota | MCS | None |
| Brown University | ScM | None |
| Cornell University | M.Eng. +Project | None |

**From CPS for ENGR 550: Graduate students must overcome several barriers after graduation. For example, many are from other countries and may be unfamiliar with the procedures and cultures relevant to hiring at American companies. All graduate students, regardless of their country of origin, need to be able to communicate to employers how their skills exceed those of less educated competitors, and they need to be attuned to the need for continuously building upon those skills. This 1-credit optional course for graduate students in the College of Engineering will train students to overcome these and related challenges. Requested effective date in Spring 2018 to facilitate enrollment in the Fall 2018 offering.