

MSCE Educational Objectives and Outcomes

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The Educational Objectives and Outcomes for the Master of Science in Civil Engineering (MSCE) degree program are listed and discussed below. These objectives have direct and indirect measurable outcomes:

- a. MSCE graduates should be able to function effectively both as professional civil engineers and as responsible and informed citizens.
 1. Direct Measure: This objective will be measured by the number of graduating MSCE students who have attained professional licensure either as professional engineers (P.E.) or professional land surveyors (L.S.). A request for verification to the respective State Boards in those states where students claim to be licensed will be made.
 2. Indirect Measure: At graduation, after the 2nd year following graduation, and after the 4th year following graduation, a questionnaire will be mailed to all graduating MSCE students asking them to complete:
 1. Contact information
 2. The impacts that the students' MSCE have on their careers (quantified in their opinions). This may be qualified in terms of their pursuit of a Ph.D. degree or their efforts in a practicing career path. This will be quantified using a rating scale of 1 (no impact) to 5 (tremendous/ invaluable impact) will be used to assess this impact. This indirect measure will be used in objectives b and c below as well.
- b. MSCE graduates should practice the profession of civil engineering proficiently within an engineering specialty that focuses on applications in Environmental, Geomatics, Geotechnical, Structural, or Transportation Engineering.
 1. Direct Measure: This objective will be measured by the number of former MSCE students who have earned advanced 'specialty' licenses, such as the G.E. (Geotechnical Engineers) or S.E. (Structural Engineers).
 2. Direct Measure: This objective will also be measured by the number of students who have earned a Ph.D. and who have careers that fully utilize their degrees, e.g., researchers in scientific laboratories, or full-time faculty. The questionnaire in 2.1 and 2.2. above will be used to remain in contact with students.

- c. MSCE graduates should use technical skills that allow them to remain current as they advance in their respective specialties (Environmental, Geomatics, Geotechnical, Structural, or Transportation Engineering).
1. Direct Measure: This objective will be measured by the number of conferences and workshops that former MSCE students attend or present at each year.
 1. Each former student will be asked to present copies of their paper(s) if they presented, and their registration receipts/ certificates indicating participation
 2. Direct Measure: This objective will be measured by the number of journal articles that former MSCE students have published during their professional careers as either researchers, professional practitioners, or as faculty. This outcome may be more applicable to graduates who have pursued academic careers. The outcome will be measured using a weighted scale that gives heavier credit for articles published in refereed journals.
 1. Each former student will be asked to present copies of their journal paper(s) and the name(s) of the journals containing those articles.
 3. Direct Measure: This objective will be measured by the number of MSCE graduate students who have completed their theses, projects, or examinations leading to the successful fulfillment of their graduate degrees at Fresno State. The outcome will be measured using a weighted scale that gives heavier credit for students who have successfully defended a thesis research project.
 1. For thesis research students, this will be quantified in terms of the research quality using rubrics to allow the thesis committee of a student to assess the (a) methodology, (b) pertinence/ impact, and (b) presentation skill level of the thesis. Whether the research was funded or not will also be used as a criterion to assess the overall 'weighted (see above)' quality of the research. The written and oral portions of the thesis will be evaluated individually. A scale of 1 (poor) to 5 (excellent) will be used for assessment. The audience attending the student's defense will also fill out the rubric evaluation for external perspective.
 1. A local practitioner will be invited to participate on the students' thesis committee. This will provide for an additional external component that has relevant insight so as to provide measurable perspectives on the practical impacts of students' theses.