

Master of Science in Industrial and Systems Engineering (MSISE) Assessment Plan

The MSISE program is housed within the Engineering Department at the CEEPS. The primary contact for assessment is H. SARPER.

Program Mission Statement: Prepare students from diverse educational backgrounds 1) to function as engineers in advanced tasks in Industrial Engineering and Operations Research fields, 2) to continue their studies and obtain other advanced degrees especially at doctoral level.

| GOAL | ACTIVITY/ PROCESS | MEASURE | FREQUENCY | HOW USED |
|-----------------------------------|--|---|----------------|---|
| Recruit enough quality students | Pursue all domestic and international venues | Enrollment date | Each semester | Check effectiveness |
| Independent research capability | MS thesis/EN 590 reports | Thesis is actually finished, and cataloged in library | Varies | Thesis count |
| Quality research | Dissemination of graduate student work (thesis or other reports) | Journal or conference proceedings, or presentation | Varies | Confirm dissemination |
| Graduates perform well on the job | Questionnaire | Self-report of graduates | Every 3 years | Survey analysis |
| Graduates obtain doctoral degrees | Contact with graduates | Admission and graduation rates | Varies | Completed doctoral degree count; doctoral degree in process count |
| Students receive good education | Exit survey | Student responses to survey | Every semester | Survey analysis |

Expected Student Learning Outcomes

Each MSISE graduate will be able to:

- apply fundamental industrial engineering knowledge in the areas of facility planning and design and operations planning and control,
- use fundamental industrial engineering tools including optimization and simulation,
- apply a broad range of other industrial engineering and general engineering knowledge,
- apply a set of specialized knowledge and tools in some area within or related to industrial engineering.

We expect at least 90% of the M.S. graduates to meet these outcomes stated above.

By applying the following rules, the MSISE program is designed to ensure these additional learning outcomes:

- Each student who does not have the required prerequisites in engineering economy, programming, and calculus based probability and statistics takes the necessary leveling courses.
- Every MSISE graduate must demonstrate knowledge of material in the core MSISE courses: simulation, operations research, facility planning and design, and operations planning and control.

Outcomes are jointly determined by the faculty and are communicated to the students primarily in the graduate seminar class (EN 593). Rubrics to evaluate theses and projects are not quite in place yet, but they will be fully developed soon.

Assessment Activities

The thesis is recommended to all students, but it is only required of those graduate assistants employed full (20 hours per week) or near full time. Some students still choose to do a thesis while some others complete projects or do both. The MSISE program is assessed by (1) periodic review by the faculty of the quality of student theses and projects and (2) periodic review of the results of exit interviews with MSISE graduates. The department periodically reviews completed theses and the reports to assess learning and research skills of the graduates. Exit interview results are used to assess and improve the program.

Assessment activities are typically done in each semester. Faculty members go over the assessment results. This activity also includes reviews of recent theses and directed reports. As a result of assessment activities, the M.S. program has had three major revisions since its founding in 1987. In 1993, thesis was no longer required. In 1999,

many electives and tracks were established instead of a very rigid program. Finally, the total credits required were reduced to 33 in 2007.

The graduate program director is responsible for initiating and supporting the ongoing continuous program improvements based on the assessment results.

Curriculum Map

| Courses and Learning Outcomes | Apply Industrial Engineering Knowledge in Facility and Operations Planning | Apply Industrial Engineering Tools in Optimization and Simulation | Apply other Industrial Engineering and General Engineering Knowledge | Apply Specialized Knowledge and Tools in some area within or related to Industrial Engineering |
|--------------------------------------|--|---|--|--|
| EN 520 | | X | | X |
| EN 571 | | X | | |
| EN 575 | X | | | |
| EN 577 | X | | X | |
| EN 591 | | | X | X |
| EN 590 | X | X | X | X |
| EN 599 EN 593 | X | X | X | X X |

The curriculum map above shows the courses where the outcomes are taught. The first four courses are taken by all M.S. students. Two research courses, EN 590 (special projects) and/or EN 599 (thesis), are taken by almost all students.