



## Program Assessment Report (PAR)

### Aerospace Systems Engineering (ASE) Masters Degree

**REPORT PREPARED by:** Yang, Zifeng

**ACADEMIC YEAR COVERED BY THIS REPORT:** 2021-2022

#### I. PROGRAM LEARNING OUTCOMES

Graduates of this program will be able to 1. Compete in the job markets and obtain employment or pursue doctoral degree in aerospace system engineering or related engineering field 2. Apply advanced engineering analysis techniques to solve complex engineering problems 3. Communicate the technical results effectively in written and/or oral form in engineering field

#### II. PROCEDURES USED FOR ASSESSMENT

##### A. Direct Assessment

Outcome 1. % of students employed, % of students continue on PhD program Outcome 2. Class final exams for ME6330 (compressible fluid flow) and ME7120 (finite element method applications) collected, in a scale of points out of 10 for 3 data points total for all students in this program are sampled to ensure that the data are representative. Outcome 3. Class final exams ME7120 collected, in a scale of points out of 10 for 3 data points, and/or thesis/papers/project reports/presentations, in a scale of poor, fair, good, excellent, based on the supervisor's evaluation, for all students in this program are sampled to ensure that the data are representative.

##### B. Scoring of Student Work

1. Data collected by Masters program chairs during an academic year 2. Master program chairs will score student's work based on the collected data 3. For outcome 1, the scoring of student's level of performance is based on the percentage (employment and PhD study) score from 0-100% For outcome 2, the scoring of student's level of performance is based on the averaged grade for

three data points for a rating from 0-10 For outcome 3, the scoring of student's level of performance is based on a rubric scale of poor, fair, good and excellent

### **C. Indirect Assessment**

Outcome 1. Indirect assessment MS exit survey. Outcome 2. Indirect assessment MS exit survey. Outcome 3. Indirect assessment MS exit survey.

### **III. ASSESSMENT RESULTS/INFORMATION:**

Assessment May 2021 Outcome 1. Exit surveys data are not collected for academic year of 2020 because there was no student graduated from the ASE program. Outcome 2. Direct assessment for three data points from ASE grad course ME6330 (compressible fluid flow) and three data points from ME7120 (Finite Element Methods Applications) are obtained and analyzed in relation to outcome 2. Outcome 3. Direct assessment for a final report from ASE grad course ME7120 (Finite Element Methods Applications) will be obtained and analyzed in relation to outcome 3.

Outcome 1. No available data for this assessment for the academic year of 2020. Outcome 2. Direct assessment from two core ASE grad classes in 2020 indicated 100% of students meeting objective (grade C and above) with an averaged grade of 7.5/10. Outcome 3. Direct assessment from a core ASE grad class in 2020 indicated 100% of students meeting objective (grade C and above) with an averaged grade of 9/10.

Outcome 1 This assessment cannot be done because of the inavailability of the data. Outcome 2 Students are meeting outcome 2. Next assessment year will focus on a different graduate class. Outcome 3 Students are meeting outcome 3 strongly. Next assessment year will focus on a different graduate class.

### **IV. ACTIONS TO IMPROVE STUDENT LEARNING**

Based on results of the prior assessment cycle, the CQI committee determined that direct assessment of Outcome 3 required the identification of graduate courses that contained an oral presentation or written report. The Graduate Studies Committee informed by CQI subsequently conducted a survey of courses that contain oral presentation or written report to all MME faculties. The

identified courses list will be used in the next assessment cycle to provide a more robust assessment of Outcome 3. These actions were well documented in the minutes of the November, 2021 CQI meeting (attached). In 2021-2022, significant faculty discussions/actions were conducted regarding assessment of student learning in our graduate programs, with a focus on satisfaction of Outcome 3. In particular, there was some concern that non-thesis students may be able to navigate our graduate programs without taking a course having a significant writing/communication component. As a result, the writing/communication component survey data provided by the faculty graduate course coordinators was cross-checked against the transcripts of all students graduated in either the Spring 2021 or Fall 2022 semesters. The results of both the course survey and the cross-check record are attached. Based on the above analysis, it was determined that all non-thesis students graduating in that timeframe took at least 2 courses containing a significant writing/communication component, while the extensive writing/communication requirements are in place for all M.S. thesis students. This suggests that our graduate programs are appropriately structured to address Outcome 3. As documented in the minutes of its latest meeting (attached), the CQI committee is prepared to suggest a new MS degree program requirement to ensure the satisfaction of Outcome 3 by all students. However, based on our current state of graduate course offerings and the analysis presented above, such a change may not be necessary at this time.

## **V. SUPPORTING DOCUMENTS**

Additional documentation, when provided, is stored in the internal Academic Program Assessment of Student Learning SharePoint site.