

# Program Level Assessment Plan

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|------------------------------------|--|
| Program: BS Mechanical Engineering | Degree Level (e.g., UG or Certificate, UG major, master's program, doctoral program) |
| Department:                        | UG Major   |

|   |  |   |  |                            |
|---|--|---|--|----------------------------|
|   | designmechanical and thermal systems that meet specified mission needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.   | Developing: MENG 1000 Design Thinking, MENG 2400 Mechatronics Systems Design<br>Reinforced: MENG 3010 Machine Design<br>Achieved: MENG 4004 Senior Design I, MENG 4014 Senior Design II, MENG 4304 Thermal Systems Design, MENG 4024 Mechanical Systems Design  | MENG 2400 Mechatronics Systems Design<br>MENG 4004 Senior Design I assignments, design report<br>MENG 4304 Thermal Systems Design  |                            |
| 3 | Students will be able to communicate effectively with a range of audiences.  | Introduction: SE 1700 Fundamentals of Engineering<br>Developing: MENG 1000 Design Thinking<br>Reinforced: MENG 3111 Mechanics Lab, MENG 3201 Fluids Lab<br>Achieved: MENG 4004 Senior Design I, MENG 4014 Senior Design II, MENG 4304 Thermal Systems Design, MENG 4024 Mechanical Systems Design, MENG 3001 Mechanical Engineering Lab | MENG 1000 Design Thinking report and presentation<br>MENG 3111 Mechanics Lab formal lab report<br>MENG 3201 Fluids Lab formal lab report<br>MENG 4014 Senior Design II presentation and design report<br>MENG 4024 Mechanical Systems Design | Same approach as Outcome 1 |
| 4 | Students will be able to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. | Introduced: SE 1700 Engineering Fundamentals<br>Developing: MENG 3010 Machine Design<br>Reinforced/Achieved: MENG 4004 Senior Design I, MENG 4304 Thermal Systems Design  | SE 1700 Engineering Fundamentals Play Pump assignment<br>MENG 3010 Machine Design<br>MENG 4004 Senior Design I assignments, presentation<br>MENG 4304 Thermal Systems Design   | Same approach as Outcome 1 |

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|---|--|--|--|----------------------------|
| 5 | Students will be able to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. | Introduction: SE 1700 Engineering Fundamentals<br>Developing: MENG 1000 Design Thinking<br>Reinforcing: MENG 3101 Solid Mechanics Lab, MENG 3111 Mechanics Lab, MENG 3201 Fluids Lab<br>Achieved: MENG 4004 Senior Design I, MENG 4014 Senior Design II, MENG 4304 Thermal Systems Design, MENG 4024 Mechanical Systems Design, MENG 3001 Mechanical Engineering Lab | SE 1700 Engineering Fundamentals<br>MENG 3101 Solid Mechanics Lab team survey<br>MENG 3111 Mechanics Lab team survey<br>MENG 4004 Senior Design I assignments, design report<br>MENG 4304 Thermal Systems Design | Same approach as Outcome 1 |
| 6 | Students will be able to develop and conduct appropriate experimentation in the mechanical engineering domain, analyze and interpret data, and use engineering judgment to draw conclusions.           | Introduction/Developing: MENG 2450 Engineering Experimentation, MENG 3101 Solid Mechanics Lab, MENG 3111 Mechanics Lab, MENG 3201 Fluids Lab<br>Reinforced/Achieved: MENG 3001 Mechanical Engineering Lab, MENG 4450 PLC's and Robotics  | MENG 3101 Solid Mechanics Lab formal lab report<br>MENG 3111 Mechanics Lab formal lab report<br>MENG 3201 Fluids Lab formal lab report<br>MENG 3001 Mechanical Engineering Lab – formal lab report               | Same approach as Outcome 1 |
| 7 | Students will be able to acquire and apply new knowledge applicable to a mechanical engineering career using appropriate learning strategies.  | Introduction: SE 1700 Engineering Fundamentals<br>Developing: MENG 2450 Engineering Experimentation<br>Reinforced/Achieved: MENG 4004 Senior Design I, MENG 4014 Senior Design II, MENG 4024 Mechanical Systems Design, MENG 4304 Thermal Systems Design   | SE 1700 Fundamentals of Engineering bibliography<br>MENG 2450 Engineering Experimentation<br>MENG 4014 Senior Design II<br>MENG 4024 Mechanical Systems Design   | Same approach as Outcome 1 |

### Use of Assessment Data

1. How and when will analyzed data be used by program faculty to make changes in pedagogy, curriculum design, and/or assessment practices?

2. How and when will the program faculty evaluate the impact of assessment-informed changes made in previous years?

The full department assessment meetings also include review of prior changes to assess their effectiveness.

### Additional Questions

1. On what schedule/cycle will program faculty assess each of the program's student learning outcomes? (Please note: It is not recommended to try to assess every outcome every year.)

Review meetings in even years - even outcomes and an overall review of the assessment plan

Review meetings in odd years - odd outcomes

2. Describe how, and the extent to which, program faculty contributed to the development of this plan.

The general format for the plan was developed and adopted in a full faculty meeting in Fall 2022, and then the adoption of the plan for UACHLC occurred in

Fall 2023 after further faculty discussion. The plan was adopted by the faculty in a full faculty meeting in Fall 2023.

### Example Rubrics

Example rubrics are provided below. Not all rubrics are available at this ~~time~~ updated versions will be provided with the annual reports for the appropriate outcomes.

#### OUTCOME 1:

##### MENG 2150 Dynamics

| Indicator   | Below Expectations | Meets Expectations | Above Expectations |
|---|--------------------|--------------------|--------------------|
| Ability to analyze and solve two dimensional rigid body kinematic problems involving rotation around an |                    |                    |                    |

MENG 4300 Heat Transfer

| Indicator   | Below Expectations   | Meets Expectations   | Above Expectations   |
|---|--|--|--|
| Ability to analyze and solve combined heat transfer problems where conduction and convection are present. | Student fails to solve the problem due to significantly improper procedures, incorrect equations, incomplete work, and/or significant mathematical errors. | Student uses mostly proper procedures to formulate and solve the resulting governing equation with at most a few errors. | Student uses proper procedures to formulate and solve the governing equations with minimal errors. |

OUTCOME 2:

OUTCOME 3:

MENG 3201 Fluids Lab

|  |   |   |   |
|--|---|---|---|
| <p>4) Ability to use effective writing syntax and voice.</p> | <p>Final report has sufficient syntax, tense, and voice issues to significantly hamper the understanding of the report by the reader.</p> | <p>Final report has occasional sections where the voice and tense are inconsistent or incorrect, or where the sentence/paragraph structure is not well organized or lacks sufficient clarity.</p> | <p>Final report uses readily comprehensible and followable syntax and uses proper voice and tense consistently throughout the report.</p> |
|--|---|---|---|

5) Overall communication quality.

Report fails to convey main points of the lab without significant parsing and re-reading of

2) Data  
analysis

Data analysis has  
major errors

Data analysis has minor errors that do  
not





