1 Attributes/Indicators/LOs

1. Knowledge Base for Engineering

1. Competence in Mathematics *

- Specification mathematics (first order logic, set theory, Parnas tables, etc.)

4. Competence in Specialized Engineering Knowledge

- Specification (Module interface specification (Abstract objects, ADTs, Generic), modules with external interaction, finite state machines, descriptive versus operational, UML, etc.)
- Verification (White box, black box, analysis, etc.)
- Functional programming
- Object oriented programming

2. Problem Analysis [Not Measured]

1. Ability to identify reasonable assumptions

2. Demonstrates an ability to identify a range of suitable engineering fundamentals (including mathematical techniques) that would be potentially useful for analyzing a technical problem.

3. Investigation [Not Measured]

1. Recognizes and discusses applicable theory knowledge base

2. Selects appropriate model and methods and identifies assumptions and constraints

3. Estimates outcomes, uncertainties and determines appropriate data to collect

4. Design

1. Recognizes and follows an engineering design process [A1–A4, Midterm, Final]

2. Recognizes and follows engineering design principles

- Software qualities [A1, A2, Midterm, Final]
- Software design principles (correctness, verifiability, etc); information hiding [A1, A2, Midterm, Final]
- Modularization and interface design (assumptions, exceptions, methods, minimal, effective, etc.)
- Design patterns

3. Obtains experience with open-ended problems [A4]

5. Use of Engineering Tools

2. The ability to use modern/state of the art tools [A1–A3, Midterm, Final]

- git, make, LaTeX, doxygen, pyunit, junit

8. Professionalism

1. Understands the role of the engineer in society, especially in protection of the public and public interest [Midterm, Final] *

3. Is aware of the PEO and the role of licensing [Midterm, Final] *