

# 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 indentifies assumptions and constraints
3. Estimates outcomes, uncertainties and determines appropraite 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] \*