

## Program-Level Assessment: Annual Report

Program Name (no acronyms): Computer Science

Department: Computer Science

Degree or Certificate Level: BS

College/School: School of Science and Engineering

Date (Month/Year):

Assessment Contact: Erin Chambers

In what year was the data upon which this report is based collected? 2022-2023

In what year was the program's assessment plan most recently reviewed/updated? 2018

Is this program accredited by an external program/disciplinary/specialized accrediting organization or subject to state/licensure requirements? No

If yes, please share how this affects the program's assessment process (e.g., number of learning outcomes assessed, mandated exams or other assessment methods, schedule or timing of assessment, etc.):

### 1. Student Learning Outcomes

Which of the program's student learning outcomes were assessed in this annual assessment cycle? (Please provide the complete list of the program's learning outcome statements and **bold** the SLOs assessed in this cycle.)

This year, assessment was targeted at the following outcomes:

PLO 5: Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

### 2. Assessment Methods: Artifacts of Student Learning

Which artifacts of student learning were used to determine if students achieved the outcome(s)? Please describe the artifacts in detail, identify the course(s) in which they were collected, and if they are from program majors/graduates and/or other students. Clarify if any such courses were offered a) online, b) at the Madrid campus, or c) at any other off-campus location.

CSCI 2050/PHIL 3410: A midterm is used to assess student achievement for PLO-5 at the "Developing" level in preparation for their final papers and group projects. The group projects are hard to assess at the level of individual achievement, so the first two questions on the midterm are presented as proxies for developing an awareness of ethical principles and their application.

The midterm is a take-home midterm that--combined with assigned texts -- assesses the students' ability to apply ethical principles to novel issues. Students are given a case study and asked to analyze it from the standpoint of both ethical principles and the people affected by the practice or technology in question. The students are also asked to develop an argument concerning the acceptability of the practice and defend their argument against counterarguments.

The midterm is both formative and summative. It simultaneously develops and assesses their ability to apply principles and make arguments. If worrying deficiencies exist, they can be addressed in the latter half of the course.

### 3. Assessment Methods: Evaluation Process

What process was used to evaluate the artifacts of student learning, and by whom? Please identify the tools(s) (e.g., a rubric) used in the process and **include them in/with this report document** (please do not just refer to the assessment plan).

Two questions are sampled to reflect both recognition of ethical principles and the awareness of the professional code of conduct.

The first question assesses the recognition of the problematic effects of computing practice.

**1. Identify the moral triggers.**

- a. **Is there anything of concern with regard to virtue or human flourishing? Explain.**
- b. **Is there anything of concern in terms of human happiness or other consequentialist concepts? Explain.**
- c. **Is there anything of concern in terms of deontology: rights or duties violated, etc? Explain.**

Students are assessed on their ability to use the vocabulary of a particular moral theory to recognize and explain the problems associated with a moral practice (if they exist). Here is a rubric for the question (note, no “Exemplary” category exists since this is the midterm.):

**Accomplished**

The student can describe the consequences and circumstances that give rise to ethical worries from all the theoretical perspectives.

**Developing**

One ethical theory may be mischaracterized and/or misidentified.

**Beginning**

Significant mischaracterization of the ethical theories

The second question is stakeholder-based:

**2. Identify the stakeholders in the case and describe the relevant consequences for each group.**

The second question assesses their ability to understand the affects of computing on various populations. The Principle 1.1 of the ACM code states, “A computing professional should contribute to society and to human well-being, acknowledging *that all people are stakeholders in computing.*”

Students are assessed on their ability to describe the consequences and to rate the severity of harm or the significance of a certain benefit to certain populations. The ability to differentiate populations into sub-groups based on their relationship to a certain technology.

Here is a sample rubric for the question (again note no “Exemplary” category exists since this is the midterm):

**Accomplished**

The student can list all the stakeholders. By analyzing the impacts to each stakeholder in terms of valence, extensiveness, and intensity, the student can understand particularly relevant and serious harms or goods.

**Developing**

Some relevant harms/goods are missing, or some tangential stakeholders are left out. The student still lists and categorizes particularly serious harms and goods of the practice.

**Beginning**

The students fails to mention particularly relevant stakeholders or salient harms/goods. The intensity, extensiveness, and valence are not cited or wrong.

**4. Data/Results**

What were the results of the assessment of the learning outcome(s)? Please be specific. Does achievement differ by teaching modality (e.g., online vs. face-to-face) or on-ground location (e.g., STL campus, Madrid campus, other off-campus site)?

NOTE: THIS DATA IS FROM THE ENTIRE POPULATION OF THE SECTION. NO ATTEMPT HAS BEEN MADE TO SEPARATE MAJOR FROM NON-MAJOR OR BS FROM BA.

For Question 1:

	Beginning/Failure	Developing	Accomplished
Spring 23	10	22	18
Fall 22	4	0	24

For Question 2

	Beginning/Failure	Developing	Accomplished
Spring 23	14	19	17
Fall 2022	13	17	0

## 5. Findings: Interpretations & Conclusions

What have you learned from these results? What does the data tell you? Address both a) learning gaps and possible curricular or pedagogical remedies, and b) strengths of curriculum and pedagogy.

There are differences in the difficulty of certain questions depending on the details of the case study, and the case study differs by semester. Question 1 was comparatively easy in the Fall of 2022 but Question 2 was comparatively more difficult.

Nonetheless, this assessment aligns nicely with both course-level and program-level outcomes. The midterm is a smaller version of their final papers/presentation, and it seems effective at alerting them to all the types of questions they should be asking regarding their chosen topics later in the semester. It also presents a skeletal version of

## 6. Closing the Loop: Dissemination and Use of Current Assessment Findings

A. When and how did your program faculty share and discuss the results and findings from this cycle of assessment?

The current findings were presented and discussed at a faculty meeting in Fall of 2023.

B. How specifically have you decided to use these findings to improve teaching and learning in your program? For example, perhaps you've initiated one or more of the following:

Changes to the Curriculum or Pedagogies

- Course content
- Teaching techniques
- Improvements in technology
- Prerequisites
- Course sequence
- New courses
- Deletion of courses
- Changes in frequency or scheduling of course offerings

Changes to the Assessment Plan

- Student learning outcomes
- Artifacts of student learning
- Evaluation process
- Evaluation tools (e.g., rubrics)
- Data collection methods
- Frequency of data collection

Please describe the actions you are taking as a result of these findings.

In general, the faculty were happy with the results and course content discussed during the meeting. This class is a regular offering and a core piece of the undergraduate, being the primary place where ethics in the discipline are addressed, and we discussed ways to update use cases and examples but were happy with the course itself in its continuing state.

In the future, these rubrics will be integrated directly into Canvas and assessment data will be sampled from there. The midterm assessment is superficially successful from a formative perspective, so it may be beneficial to explore its relationship to success on the final paper or to other application assignments throughout the semester.

This year's data will also be reviewed in the future when this PLO is assessed again. As the first assessment of this PLO, there is no longitudinal data.

If no changes are being made, please explain why.

## 7. Closing the Loop: Review of Previous Assessment Findings and Changes

### A. What is at least one change your program has implemented in recent years as a result of previous assessment data?

Previous assessment focused on PLOs that were examined in software engineering and in theory.

For theory, there were no real surprises. We discussed outcomes and content of the theory sequence, but no major changes or recommendations came out of the discussion.

For software engineering, the conclusion in 2022 was cautiously positive, as students were demonstrating mastery of the content. The concerns with security will be revisited in an upcoming cycle, as the introduction to the topic is now mandatory in the new 2510 class, so we wish to revisit after another cycle to see if earlier exposure improves results in the upper level class in future rounds.

### B. How has the change/have these changes identified in 7A been assessed?

The assessment for software engineering will be repeated in a future year, after a round of assessment of 2510, so we can see if outcomes improve with the introduction of content in earlier classes.

### C. What were the findings of the assessment?

N/A

### D. How do you plan to (continue to) use this information moving forward?

See 7b.

**IMPORTANT: Please submit any assessment tools (e.g., artifact prompts, rubrics) with this report as separate attachments or copied and pasted/appended into this Word document. Please do not just refer to the assessment plan; the report should serve as a stand-alone document. Thank you.**