BS Computer Science

Applied Option, Software Engineering

The following proposed Applied Option in Software Engineering supplements the Computer Science core requirements with courses that:

1. Bridge the gap between introductory programming (1xx) and software engineering (3xx)
2. Address industry needs, (e.g. recent IAB feedback)
3. Provide an intermediate step toward a four-year BS in Software Engineering

The courses include existing 400-level electives and four new courses:

* A three course, 200-level sequence, on the development of larger software applications
* One 300-level course that extends the existing CS 361 & 362 sequence

**Rationale for SE 201 – 203**

Students experience programming “in the small” in year one (CS 160-162), experience very few courses in year two (CS 261, 271 and 290), and then engage in “software engineering” (CS 360 & 361) in year three. Learning software engineering concepts can be challenging when students have only written short, focused programs and have never engaged in building a larger software system. The SE 201 – 203 sequence engages students in programming “in the large” (more OO, more practice, more APIs, more problem solving, more tools, bigger programs) in year two, providing a learning experience that bridges the first year and third year courses.

(See **Learning Outcomes**, below, for details.)

**Rationale for SE 303**

The CS 361 & 362 courses address the “front end” and “back end” of a software lifecycle, from requirements analysis to verification and maintenance. Modern software engineering is a huge topic, and even our IAB has raised some curricular shortcomings, including continuous integration and delivery, automated testing, cloud computing, and infrastructure. A third course in the software engineering sequence provides more surface area for such topics and additional learning outcomes.

(See **Learning Outcomes**, below, for details.)

**Applied Option Criteria**

“Options consist of a minimum of 21 designated quarter credits of related course work, 15 of which must be at the upper-division level.” (Office of Academic Programs & Assessment)

The Applied CS Program must meet the following conditions:

* Minimum of 32 credits
* Recommended minimum of 20 upper division credits
* Coherent body of knowledge where applications of computer science could play an important role

## Core (20 credits)

SE 201 Software Development I (4)

SE 303 Software Engineering III (4)

CS 466 Web-based Startup Project (4)

SE 402 Business of Software II (4)

SE 403 Business of Software III (4)

## Electives (12 credits)

Choose 12 credits from the following:

CS 492 Mobile Software Development (4)

CS 493 Cloud Application Development (4)

CS 464 Open Source Software (4)

ECE 478 Network Security (4)

CS 434 Machine Learning & Data Mining (4)

CS 447 Wireless Embedded Systems (4)

CS 406 Projects (4) or CS 401 Research (4)

4 credits at lower division (SE 201)

28 credits at upper division (SE 303, CS 466, SE 402, SE 403, and CS 4xx electives)

Example Four-Year Plan

TODO

Current Applied Option, Web and Mobile Software Development



Learning Outcomes

SE 201

Description TODO

* Outcome TODO

SE 303

Description TODO

* Outcome TODO

SE 402

Description TODO

* Outcome TODO

SE 403

Description TODO

* Outcome TODO