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 (16 credits)

SE 201 Software Development I (4)

SE 202 Software Development II (4)

SE 203 Software Development III (4)

SE 303 Software Systems Infrastructure (4)

## Electives (16 credits)

Choose 16 credits from the following:

CS 492 Mobile Software Development (4)

CS 493 Cloud Application Development (4)

CS 464 Open Source Software (4)

CS 466 Web-based startup Project (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)

12 credits at lower division (SE 201, 202, 203)

20 credits at upper division (SE 303, CS 4xx electives)

Example Four-Year Plan

TODO

Current Applied Option, Web and Mobile Software Development



Learning Outcomes

CS 201

Description TODO

* Outcome TODO

CS 202

Description TODO

* Outcome TODO

CS 203

Description TODO

* Outcome TODO

SE 303

Description TODO

* Outcome TODO