IV. Curriculum

Intent

- The curriculum is consistent with the program's documented objectives.
- It combines **technical** requirements with **general education** requirements and electives to prepare students
- for a professional career in the computer field,
- for further study in computer science,
  and
- for functioning in modern society.
- The technical requirements include
- up-to-date coverage of basic and advanced topics in **computer science**
- an emphasis on **science and mathematics**.

Standards

- Curriculum standards are specified in terms of semester hours
- 30 semester hours generally constitutes one year of full-time study
- equivalent to 45 quarter hours
- A course or part of a course can only be applied toward one standard.

Curriculum is divided into four sections

- General
- Computer Science
- Mathematics and Science
- Additional Areas of Study

Curriculum Standards -- General

I-1. The curriculum must include at least 40 semester hours of up-to-date study in computer science topics.

I-2. The curriculum must contain at least 30 semester hours of study in mathematics and science as specified below under Mathematics and Science.

I-3. The curriculum must include at least 30 semester hours of study in humanities, social sciences, arts and other disciplines that serve to broaden the background of the student.

I-4. The curriculum must be consistent with the documented objectives of the program.

Curriculum Standards -- Computer Science

I-5. All students must take a broad-based **core** of fundamental computer science material consisting of at least 16 semester hours.

I-6. The core materials must provide basic coverage of **algorithms**, **data structures**, **software design**, **concepts of programming languages**, and **computer organization** and **architecture**.

I-7. **Theoretical foundations**, **problem analysis**, and **solution design** must be stressed within the program's core materials.

I-8. Students must be exposed to a variety of programming languages and systems and must become proficient in at least one higher-level language.

I-9. All students must take at least 16 semester hours of **advanced** course work in computer science that provides breadth and builds on the core to provide depth.

Curriculum Standards -- Mathematics and Science

I-10. The curriculum must include at least **15 semester hours** of **mathematics**.

I-11. Course work in mathematics must include **discrete mathematics**, **differential and integral calculus**, and **probability and statistics**.

I-12. The curriculum must include at least **12 semester hour**s of **science**.

I-13. Course work in science must include the equivalent of a two-semester sequence in a laboratory science for science or engineering majors.

I-14. Science course work additional to that specified in Standard IV-13 must be in science courses or courses that enhance the student's ability to apply the scientific method.

Curriculum Standards -- Additional Areas of Study

I-15. The oral communications skills of the student must be developed and applied in the program.

I-16. The written communications skills of the student must be developed and applied in the program.

I-17. There must be sufficient coverage of social and ethical implications of computing to give students an understanding of a broad range of issues in this area.

Sample Advanced Courses

- algorithms and data structures,
- artificial intelligence and robotics,
- computer networks,
- computer organization and architecture,
- database and information retrieval,
- human-computer communication,
- numerical and symbolic computation,
- operating systems,
- programming languages,
- software methodology and engineering,
- theory of computation.