

## 5-Year BS/MS in Computer Science

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### Rationale

#### Exact Title

5-year BS/MS in Computer Science

#### Purpose and Goals

To provide research training for students who wish to work in a computing research lab, or possibly continue to PhD studies.

#### Level of Demand

Large companies that develop computing software and hardware, e.g., Microsoft, Intel, IBM, Citrix, Apple, Yahoo, Google, etc., maintain research and development laboratories. In order to work in such a laboratory it is necessary to have research training to at least the MS level. Senior management positions in the broader computing industry require the ability to understand a range of advanced topics in Computer Science. Thus many companies prefer to have people with MS degrees as project leads. While undergraduate coursework provides the basis for this, research training provides additional advanced coursework, and also the ability to absorb and understand further topics on demand. Career-wise, an MBA is very attractive. Many companies will pay for the MBA part-time or give a year leave for the employee to attend university full-time. These are very selective programs, since the company will be paying full-tuition. Having a recorded accomplishment at the Master's level will give our 5-year BS/MS a strong lead in being selected for these programs. The world's expanding computing industry provides demand in both the research and management aspects.

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### Curriculum

#### Major Division

Computer Science

#### Detailed Description

##### *Requirements*

Students in the 5-year BS/MS must complete the requirements for a BS in Computer Science, and the requirements for a 30 credit MS in Computer Science with thesis. No credits may be counted towards both requirements. Students enter the "MS-phase" of the program when they have met the following requirements:

- They have achieved senior status, i.e., earned 89 credits towards their BS in Computer Science.
- Within the requirements for a BS in Computer Science, they have completed the prerequisites for entry into the regular MS program, i.e., CSC120, CSC220, CSC314, CSC517, CSC527, MTH161, MTH224, and MTH309.
- They have completed 3 credits of CSC410/1 in a research oriented project.
- They have a GPA of 3.0 in the CSC courses taken towards their BS in Computer Science.
- They have advised the Director of Graduate Studies of their eligibility for the MS-phase.

Students in the MS-phase must complete 3 further credits of CSC410/1 in a research oriented project, as

part of their BS in Computer Science (this project will normally be the starting point for the MS research). Students in the MS-phase may take 600 level courses that count towards completing the requirements for the MS in Computer Science.

#### *Tracks*

None

#### *Course Offerings*

The course requirements for the BS in Computer Science can be found online at [http://www.cs.miami.edu/50\\_Programs/20\\_Bachelor\\_of\\_Science/](http://www.cs.miami.edu/50_Programs/20_Bachelor_of_Science/) and in the university bulletin. The Department of Computer Science offers the courses necessary for a BS in Computer Science in a rotation that provides students with flexibility in meeting the requirements for a BS in Computer Science. The course requirements for the MS in Computer Science can be found online at [http://www.cs.miami.edu/50\\_Programs/60\\_Master\\_of\\_Science/](http://www.cs.miami.edu/50_Programs/60_Master_of_Science/) and in the university bulletin. The Department of Computer Science offers at least two 600 level courses each semester, which provides MS students (and will provide BS/MS students) with flexibility in meeting the requirements for the MS in Computer Science.

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## **Students**

### **Estimated Number of Students**

It is expected that 2-5 students will enter the MS-phase of the program each year.

### **Admission and Retention**

- Incoming BS in Computer Science students can be admitted to the 5-year BS/MS program if their mathematics placement is MTH108 or higher (currently that's Math SAT  $\geq$  630 or Math ACT  $\geq$  28).
  - Existing BS in Computer Science students can switch into the 5-year BS/MS when they have met the requirements for entering the MS-phase of the program.
  - Students can be removed from the 5-year BS/MS if they have not met the prerequisites for admission to the MS-phase by the time they have achieved senior status, i.e., earned 89 credits towards their BS in Computer Science.
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## **Administration**

### **Additional Requirements**

None. The courses and infrastructure available from the existing MS and PhD programs in Computer Science will be used to run the 5-year BS/MS.

### **Budget**

None.

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## **Comparisons**

We have compared our proposed 5-year BS/MS with those of other high quality comparable institutions. Some details are below, but overall our program is very similar to others', with the following significant

differences:

- We allow students to join the program from the start of their UM career. Although this has no practical effect, it will serve as a recruitment tool for new students.
- Our requirements for admission to the MS-phase are based on fixed requirements rather than judgement, i.e., it will be easier to determine eligibility.
- Our requirements for completion do not allow any double counting, which occurs in other programs. Our students will have to separately complete the BS and MS requirements, i.e., it will have a higher academic quality.

### **Stony Brook University**

<http://www.cs.sunysb.edu/undergrad/BSMSprogram.html>

- Students cannot enrol in the program from the start (we allow that, as a recruitment tool).
- The GPA requirement is 3.25 overall and in CSC courses (ours is 3.0 in only CSC courses).
- Entry requires a resume, statements of purpose, and letters of reference from faculty (we do not require those).
- Only two graduate level courses can be taken in the senior year (we have no limit).
- The graduate level courses count towards both the BS and MS (we do not allow any double counting).
- They offer \$1000 scholarships (we have no scholarships).

### **University of Rochester**

<http://www.cs.rochester.edu/u/marty/3-2-program-computer-science>

- Students cannot enrol in the program from the start - they must be in their junior year (we allow that, as a recruitment tool).
- Applicants must have found a faculty mentor, and must submit letters of reference (we do not require those).
- Students must finish the requirements for their BS, and the program of study for the MS is determined with the mentor (we have more clearly specified requirements for the MS-phase).

### **Virginia Tech**

<http://www.cs.vt.edu/undergraduate/degrees/5yr-BS-MS>

- Students cannot enrol in the program from the start (we allow that, as a recruitment tool).
- Up to four graduate level courses can be taken in the senior year (we have no limit).
- The graduate level courses count towards both the BS and MS (we do not allow any double counting).

### **University of North Carolina, Charlotte**

<http://cs.uncc.edu/?q=node/352>

- Students cannot enrol in the program from the start (we allow that, as a recruitment tool).
- The GPA requirement is 3.2 overall and 3.3 in CSC courses (ours is 3.0 in only CSC courses).
- Entry requires approval from the MS Program Director (we do not require that).
- Up to twelve graduate level credits can be taken in the senior year (we have no limit).
- The graduate level credits count towards both the BS and MS (we do not allow any double counting).

### **University South Florida**

<http://www.cse.usf.edu/graduate/5year>

- Students cannot enrol in the program from the start - they must have completed 90 undergraduate hours (we allow that, as a recruitment tool).
  - The GPA requirement is 3.25 overall (ours is 3.0 in only CSC courses).
  - Entry requires letters of reference from faculty (we do not require that).
  - Up to 6 graduate level credits can count towards both the BS and MS (we do not allow any double counting).
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