Dear Colleagues:

Attached for consideration at the November 17, 2006, Full UCC meeting is a request from the College of Arts and Sciences for Areas of Emphasis in Computer Systems, Software Design, Computational Science and Visualization, Internet and Information Technology, Theoretical Computer Science, and Artificial Intelligence within the major of Computer Science under the Bachelor of Science degree.

Sincerely,

Dr. William K. Vencill, Chair
University Curriculum Committee

cc: Dr. Arnett C. Mace, Jr.
Dr. Delmer D. Dunn
October 11, 2006

Dr. Hugh Ruppersburg
Senior Associate Dean
Franklin College of Arts and Sciences
Old College
CAMPUS

Dear Hugh:

I am writing to request the creation of Area of Emphasis in the Bachelor of Science degree in Computer Science. Computer Science is a very broad discipline and students, while still acquiring the necessary breadth of knowledge, may elect to focus on a specific area of Computer Science and take a number of courses for an in-depth study. These areas are frequently recognized by employers, and it would be beneficial to students to have an official annotation on their transcripts. The faculty of Computer Science is in full support of this request. Thank you for your consideration.

Sincerely,

Kris J. Kochut
Professor and Head

Encl.(1)
Proposal for Area of Emphasis

School/College: Franklin College of Arts and Sciences

Department/Division: Computer Science
Major: BS in Computer Science

Major Requirements: See attached.

Area of Emphasis Title: See attached.

Proposed Starting Date: Spring 2007

Area of Emphasis Description: See Attached.

Justification: Computer Science has a number of important areas, each of which requires a focused, in-depth study. This fact has prompted the Computer Science Department at UGA to identify 6 areas of emphasis. Students will be taking 12 credit hours of course work from their chosen area of emphasis. As part of their upper-division electives, students will also be taking courses from other areas of emphasis. This will enable students to be more focused and have the required breadth that is necessary for Computer Science graduates in today's job market.

Signatures:

[Signature]
Department Head

[Signature]
Computer Science Department

10/11/2006
Date
Area of Emphasis Proposed Curriculum Requirements

for the Bachelor of Science (BS) degree in Computer Science:

BS degree students must satisfy four types of requirements:

- UGA Core Curriculum requirements, required of all University System students;
- Computer Science Department Requirements;
- Franklin College requirements, required of all students in the Franklin College of Arts and Sciences at the University of Georgia; and
- Additional University-wide requirements.

i) UGA Core Curriculum Requirements

The UGA Core Curriculum prescribes competency in five academic areas:

<table>
<thead>
<tr>
<th>Area</th>
<th>Content</th>
<th>Typical Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area A</td>
<td>Essential Skills</td>
<td>English Rhetoric and Composition; Math</td>
</tr>
<tr>
<td>Area B</td>
<td>Institutional Option</td>
<td>Electives</td>
</tr>
<tr>
<td>Area C</td>
<td>Humanities</td>
<td>Literature, Art, Philosophy, Religion</td>
</tr>
<tr>
<td>Area D</td>
<td>Natural Science</td>
<td>Chemistry, Biology, Mathematics</td>
</tr>
<tr>
<td>Area E</td>
<td>Social Science</td>
<td>History, Political Science, Economics</td>
</tr>
</tbody>
</table>

A sixth Core Curriculum area, Area F, consists of courses specific to the major (see below). A complete list of courses satisfying the Core Curriculum requirements can be found in the UGA online bulletin.

ii) Computer Science Department Requirements

All computer science department requirements must be completed with a "C" or better.

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 1302</td>
<td>Software Development</td>
<td>CSCI 1301</td>
</tr>
<tr>
<td>CSCI 2670</td>
<td>Theory of Computation</td>
<td>CSCI 2610</td>
</tr>
<tr>
<td>CSCI 2720</td>
<td>Data Structures</td>
<td>CSCI 1302, CSCI 1730</td>
</tr>
<tr>
<td>MATH 2260</td>
<td>Calculus II</td>
<td>MATH 2200/L or 2250</td>
</tr>
</tbody>
</table>
Major Requirements for Computer Science
by Area of Emphasis

1. Computer Systems:
Requirements: at least 12 hours of courses taken as electives from the following:
- Operating Systems (CSCI 4730),
- Computer Networks (CSCI 4760),
- Computer Security (CSCI 4250),
- Compilers (CSCI 4570),
- VLSI System Design (CSCI 4750),
- Distributed systems (CSCI 4900 for now).

2. Software design:
Requirements: at least 12 hours of courses taken as electives from the following:
- Software Engineering (CSCI 4050),
- Database Management (CSCI 4370),
- Compilers (CSCI 4570),
- Programming Languages (CSCI 4500),
- Simulation and Modeling (CSCI 4210).

3. Computational Science and Visualization:
At least one course taken as elective from each of the following groups (total at least 12 hours):

i) Numerical methods and computing (CSCI 4140),
   Numerical Simulations in Science and Engineering (CSCI 4150).

ii) Computer graphics (CSCI 4810),
    Human computer interaction (CSCI 4800).

iii) Modeling and Simulation (CSCI 4210),
     Algorithms (CSCI 4470),
     Algorithms for Computational Biology (CSCI 4490).

4. Internet and Information Technology:
Requirements: at least 12 hours of courses taken as electives from the following:
- Web Programming (CSCI 4300),
- Global Information Systems (CSCI 4350),
- Database Management (CSCI 4370),
- AI & the Web (CSCI 4900 for now).
5. Theoretical Computer Science:

Requirements: at least 12 hours of courses including Algorithms (CSCI 4470) and the remainder taken as electives from the following:

- Introduction to Linear Algebra (MATH 3000),
- Algorithms for Computational Biology (CSCI 4490),
- Introduction to Quantum Computation (CSCI (MATH)(PHYS) 4612),
- Combinatorics ((CSCI)(MATH) 4670),
- Graph Theory ((CSCI)(MATH) 4690).

6. Artificial Intelligence (AI):

Requirements: at least 12 hours of courses including Introduction to AI (CSCI 4550) and the remainder taken as electives from the following:

- Game programming (CSCI 4070),
- Robotics (CSCI 4530),
- Symbolic programming (CSCI 4540),
- Evolutionary computation (CSCI 4560),
- Human Computer Interaction (CSCI 4800).

In addition: students in any of the areas of emphasis are required to take CSCI 4720 (Computer Architecture) and at least 8 credit hours of any CSCI 4000-level course or any MATH upper-division course except MATH 4850. (choose courses adding up to at least 8 credit hours, including at most 4 hours of MATH courses)

iii) Franklin College Requirements

Many of the Franklin College requirements can be met by courses that also satisfy the Core Curriculum requirements:

<table>
<thead>
<tr>
<th>Franklin College Requirements</th>
<th>Typical Courses to Satisfy this Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign Language</td>
<td>French, Spanish, Japanese, Swahili</td>
</tr>
<tr>
<td>Literature</td>
<td>English literature; comparative literature</td>
</tr>
<tr>
<td>Fine Arts/Philosophy/Religion</td>
<td>Art, music, drama, philosophy, religion</td>
</tr>
<tr>
<td>History</td>
<td>American history; world history</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>Economics, Political Science, Sociology</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>Chemistry, Physics, Astronomy, Geology</td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>Biology, Ecology</td>
</tr>
<tr>
<td>Cultural Diversity</td>
<td>African-American studies, multicultural literature</td>
</tr>
</tbody>
</table>
iv) Additional University-wide Requirements

39-hour rule: Students must complete at least 39 hours of upper-division classes (classes numbered 3000 and above). The Computer Science major requirements include 24 hours of upper-division classes. Students must take an additional 15 hours of upper division courses as part of their elective courses.

The University imposes several other miscellaneous requirements, listed in the UGA online bulletin. With proper planning, these requirements can be satisfied by the same courses used to satisfy the requirements listed above.

Academic Advising

The professional advisors at the Franklin College and the CS faculty advisors will help students navigate the maze of requirements and achieve a timely graduation. See the Computer Science Department’s Undergraduate Advising webpage for details on the advising process.