THE FACULTY SENATE
June 10, 2003

MEMORANDUM

TO: President Robert M. Gates

SUBJECT: Certificate Program in Computational Science (PS.21.06)

At its regular meeting on June 9, 2003, the Faculty Senate approved the following item from the Graduate Council and submits it for your approval. Attached is a copy of the material sent to our Senators.

Certificate Program
College of Science
Department of Mathematics, Statistics and Computer Science
Institute for Scientific Computation
Computational Sciences

Thank you for your time and consideration. Please inform me of your action on this matter.

Martha Louddor
Speaker, 2003-2004

Attachment

cc: Dr. David Prior
    Dr. Karon Watson
    Dr. Rick Giardino
    Dr. Richard Ewing
    Dr. Joe Newton

Approved:

Robert M. Gates, President

Date

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senate@tamu.edu www.tamu.edu/faculty_senate
March 18, 2003

Memorandum

To: Graduate Council

From: Richard E. Ewing, Vice President for Research
      Director, Institute for Scientific Computation

Subject: Pursuit of a transcripted Computational Sciences Certificate Program

The Institute for Scientific Computation (ISC), in conjunction with the Mathematics, Statistics, and Computer Science departments, has created the Computational Sciences Certificate Program.

The Computational Sciences Certificate Program offers graduate students a broad-based multidisciplinary enhancement to their degree program. With the addition of a few courses from each of the three disciplines, this new certification program will add value and marketability to the graduates' degree.

We now request that the University reinforce its commitment to Imperative 2 of the Vision 2020 plan by granting the Computational Sciences Certificate Program the status of transcripted certification.

The attached page contains the curriculum outline of the additional classes that students in each discipline must complete to obtain a Computational Sciences Certificate.

With institutional support, this program can create some of the most marketable and best-qualified graduates in the nation. I hope that you can approve this request at your next meeting. Thank you.
February 24, 2003

Memorandum

To: Robert M. Gates, President

Through: Robert H. Strawser, Speaker, Faculty Senate

Through: Rick Giardino, Dean, Graduate Studies, Graduate Council

Through: G. Kemble Bennett, Dean, Dwight Look College of Engineering
        H. Joseph Newton, Dean, College of Science

Through: James Calvin, Department Head, Statistics
        Valerie Taylor, Department Head, Computer Science
        Albert Boggess, Department Head, Mathematics

Through: Michael Longnecker, Statistics Representative
        Vivek Sarin, Computer Science Representative
        Thomas Schlumprecht, Mathematics Representative

From: Richard E. Ewing, Vice President for Research
      Director, Institute for Scientific Computation

Subject: Pursuit of a transcribed Computational Sciences Certificate Program

The Institute for Scientific Computation (ISC), in conjunction with the Departments of Mathematics, Statistics, and Computer Science, has created the Computational Sciences Certificate Program. We recently circulated a copy of this memorandum. We obtained suggestions and clarifications on several issues and would now like to submit this final version for your approval. The changes are 1) the certification program is now open to all TAMU graduate students and 2) the capstone project has been more clearly described. You can see the original circulated memo with signatures attached.

The Computational Sciences Certificate Program offers graduate students a broad-based multidisciplinary enhancement to their degree program. With the addition of a few courses from each of the three disciplines, this new certification program will add value and marketability to the graduates' degree.
We now request that the University reinforce its commitment to Imperative 2 of the Vision 2020 plan by granting the Computational Sciences Certificate Program the status of transcribed certification.

The attached pages contain the curriculum outline of the additional classes that students must complete to obtain a Computational Sciences Certificate.

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Computational Sciences Certificate Program

Motivation and Goals
The development of a Computational Sciences Certificate Program is motivated by the increased use of computational techniques to help solve complex science and engineering programs. This program is targeted to science and engineering students enrolled in the graduate program. The goal of this certificate program is to provide formal documentation upon a student’s transcript that he or she has taken additional courses focused on the computational aspects that supplement a given degree in science and engineering.

Computational Science Certificate Requirements
A student must complete four courses, as described below, and a capstone project in his/her home department to fulfill the certificate requirements.

Course Options
As the focus of this certificate is on providing students with the computational aspects, students are required to take courses from the list given below. Two of the courses must be * courses from two different departments, and exclusive of one’s home department. The remaining two courses can be any courses from the given list, as long as they are not from the student’s home department. Outside courses listed on the student’s degree plan can be used to satisfy the four course requirements.

- Mathematics (Each of the following courses will be offered once a year):
  - 609 Numerical Analysis (*)
  - 610 Numerical Methods in PDEs
  - 660 Computational Linear Algebra (cross-listed with CPSC 660)

- Statistics (Each of the following courses will be offered once a year)
  - 604 Special Problems in Statistical Computation and Analysis (*)
  - 605 Advanced Topics in Computational Statistics
  - 608 Least Squares and Regression Analysis
  - 626 Methods in Time Series Analysis
  - 636 Methods in Multivariate Analysis

- Computer Science (Each of the following courses will be offered once every two years)
  - 603 Database Systems and Applications
  - 654 Supercomputing
  - 659 Parallel/Distributed Numerical Algorithms and Applications (*)
    [Note: Math 609 will satisfy the CPSC 653 prerequisite]
  - 660 Computational Linear Algebra (cross-listed with MATH 660)
Capstone Project
The goal of the capstone project is to provide students with experience in the area of computational science. The intended length of the project is one semester. This project may be fulfilled by

1) an independent study graduate course in the home department, or
2) an independent study graduate course outside the home department, or
3) as part of a MS thesis or project required by the home department, or
4) as part of a PhD dissertation.

To fulfill this requirement, the faculty member supervising the capstone project must write a memo describing the project and certifying the project’s computational component; this memo must be placed in the student’s file in the home department.
January 27, 2003

Memorandum

To: Graduate Council

From: Richard E. Ewing, Vice President for Research Director, Institute for Scientific Computation

Subject: Pursuit of a transcribed Computational Sciences Certificate Program

The Institute for Scientific Computation (ISC), in conjunction with the Graduate Advisors from the Mathematics, Statistics, and Computer Science departments, has created the Computational Sciences Certificate Program.

The Computational Sciences Certificate Program offers graduate students in the Mathematics, Statistics, and Computer Science departments a broad-based multidisciplinary enhancement to their degree program. With the addition of a few courses from each of the three disciplines, this new certification program will add value and marketability to the graduates’ degree.

We now request that the University reinforce its commitment to Imperative 2 of the Vision 2020 plan by granting the Computational Sciences Certificate Program the status of transcribed certification.

The attached page contains the curriculum outline of the additional classes that students in each discipline must complete to obtain a Computational Sciences Certificate.

With institutional support, this program can create some of the most marketable and best-qualified graduates in the nation. I hope that you can approve this request at your February 13, 2003 meeting. Thank you.
Computational Sciences Certificate Program

Committee Members:
M. Longnecker (Statistics), V. Sarin (Computer Science), T. Schlumprecht (Math)

Computational Science Certificate Option
A minimum of 14 credit hours of your degree plan must come from this list of interdisciplinary courses to receive a Certificate in Computational Science.

Required Courses
684 Internship
Project/Capstone

Core Course Options
The course options listed below represent the minimum level of courses required to complete this track. Students may take courses of a higher level to fulfill these requirements if suggested by their advisor.

<table>
<thead>
<tr>
<th>Math Option</th>
<th>Computer Science Option</th>
<th>Statistics Option</th>
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<tbody>
<tr>
<td>CPSC Courses</td>
<td>STAT Courses</td>
<td>CPSC Courses</td>
</tr>
<tr>
<td>STAT Courses</td>
<td>MATH Courses</td>
<td>MATH Courses</td>
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</tbody>
</table>

Mathematics
Each of the following courses will be offered once a year.
609 Numerical Analysis (3-3) 4 credits
610 Numerical Methods in PDEs (3-3) 4 credits
660 Computational Linear Algebra (3-0) 3 credits, cross-listed with CPSC 660.

Statistics
Each of the following courses will be offered once a year.
601 Statistical Analysis (3-2) 4 credits
608 Least Squares and Regression Analysis (3-0) 3 credits
636 Methods in Multivariate Analysis (3-0) 3 credits

Computer Science
Each of the following courses will be offered once every two years.
603 Database Systems and Applications (3-0) 3 credits
654 Supercomputing (3-0) 3 credits
659 Parallel/Distributed Numerical Algorithms and Applications (3-0) 3 credits
660 Computational Linear Algebra (3-0) 3 credits, cross-listed with MATH 660.
November 15, 2002

Memorandum

To: Robert M. Gates, President

Through: Robert H. Strawser, Speaker, Faculty Senate

Through: Rick Giardino, Dean, Graduate Studies, Graduate Council

Through: G. Kemble Bennett, Dean, Dwight Look College of Engineering
        H. Joseph Newton, Dean, College of Science

Through: James Calvin, Department Head, Statistics
        Donald Friesen, Acting Department Head, Computer Science
        Albert Boggess, Acting Department Head, Mathematics

Through: Michael Longnecker, Statistics Representative
        Vivek Sarin, Computer Science Representative
        Thomas Schlumprecht, Mathematics Representative

From: Richard E. Ewing, Vice President for Research
      Director, Institute for Scientific Computation

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