Temple University
Request to Establish, Terminate, or Change an Academic Program
(DRAFT 2.25.09)

Date: 12/2/2009 School/College: CST

Individual responsible for proposal:

Justin Y. Shi
E-mail: shi@temple.edu

Action sought:
*Go to http://www.temple.edu/deputyprovost/academic-proposals/OfficeoftheDeputyProvost-academicchanges.htm for a list of action types.

___ Establish    ___ Terminate

✓ Change: ___ Rename ___ Restructure ___ Change in array

Type of Program: (list) Select from list below
*Go to http://www.temple.edu/deputyprovost/academic-proposals/OfficeoftheDeputyProvost-academicprogramdefinitions.htm for a list of program definitions.

___ Major
___ Major with required or optional track/concentration
✓ Track / concentration (within an existing major)
___ Minor
___ Collegial Requirements
___ Co-Major
___ Dual Degree or Dual/Plus Degree
___ Joint Degree
___ Academic Honors
___ Certificate of Specialized Study
___ Certificate of Advanced Study
___ Certificate of Completion (non-credit)

For changes to courses, use the Proposal to Establish, Revise or Terminate a Course form.

Degree, Abbreviation and Title of Program: Ph.D. in CS: Computer Network Systems
Track

Brief Description (approximately 250 words):

see attached

Proposed date of implementation: Fall 2010 Spring 2 Other:

Additional information:
Review and Approvals

☐ This proposal has gone through the necessary approval processes as outlined by the by-laws, governance structure, or practices of the school/college, and I approve the proposal on behalf of the school/college.

Dean ___________________________ Date ________

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Computer and Network Systems:

A New Ph.D. Track Proposal

1. A detailed description of the changes to the program, rationale, and educational objectives.
A brief description of the disciplinary reasons guiding the proposed program (i.e. developments in the field, accreditation standards, employer feedback)

A new Computer Science Ph.D. Track in Computer and Network Systems is proposed. This will be the fourth track in addition to three existing tracks in Artificial Intelligence, Software Systems and Information Systems.

The Computer Science Department has recently hired new faculty members with a strong focus in computer and network systems research. They also bring new Ph.D. students who do not fit well in the existing Ph.D. tracks. This proposal is designed to fill this gap.

The education objectives include:

a) Research and development in wireless, wired and sensor networks, ad hoc networks.
b) Research and development in information security and assurance.
c) Research and development in reliable parallel and distributed systems.

These areas are fundamental to future developments of Computer Science. They are not covered by our existing Ph.D. tracks.

2. Curriculum (Include a semester-by-semester curriculum grid)

Special characteristics of the program, type and level of instruction, new courses to be developed or syllabi of existing courses, sequencing of courses, concentrations or tracks, and other requirements such as comprehensive exams, theses, practica, non-standard grading scales, auditions, portfolio review, etc.

Description of how courses will be scheduled to ensure that students will be able to complete the course of study within a reasonable time frame. List campus(es) where the program will be offered or indicate if program will be delivered at an off-campus, non-Temple location

The proposed track will be offered at the Temple University main campus. It will include existing CIS graduate courses and courses developed by new faculty members. The proposed track includes areas of active, externally funded research. This not only gives the needed credentials for the proposed program, but also affords students an opportunity to participate in focused research areas that are not currently available in the CIS graduate curriculum.

The proposed track will follow the same structure of existing tracks. It will consist of 16 CIS graduate courses with at least 8 of the 16 being didactic courses, one qualifying examination, one preliminary I examination, one preliminary II examination and a dissertation defense. The
candidate is expected to complete the study in less than 3-5 years after passing the Ph.D. Qualifying Exam.

The specific time lines are as follows:

Year 1: Preparation

Year 2: Qualifying Exam.

Year 2.5: Preliminary I Exam

Year 3: Preliminary II Exam

Year 4: Dissertation Defense

Five CIS graduate courses are considered core to the proposed track:

CIS8512: Operating Systems
CIS9617: Computer Networking and Communication
CIS8511: Programming Techniques
CIS8513: Automata and Formal Language
CIS8542*: Computer Architecture

A Ph.D. candidate must choose at least two courses in the above list for inclusion in the Qualifying Exam.

Graduate Didactic Courses:

CIS 8526: Machine Learning
CIS 8536: Ad Hoc Networks (offered as a seminar course in Spring 2010)
CIS 8537: Network and Information Security (offered as seminar in Spring 2010)
CIS 8539*: Wireless Network and Communication (Fall 2010)
CIS 8541*: Distributed Computing (Fall 2010)
CIS 9603: Artificial Intelligence
CIS 9615 Design & Analysis of Algorithms
CIS 9616: Principles of Data Management
CIS 9618: Principles of Software Engineering
CIS 9664: Knowledge Discovery and Data Mining
CIS 9665: Advanced Topics in Data Base Systems
CIS 9666: Advanced Networks and Client-Server Computing
CIS 9669: Parallel Processing

The candidate can choose at most 5 of the above list for the Qualifying Exam.

Although graduate credits may be given for courses taken from other Departments or Universities with the approval of CIS Graduate Committee, the content of the Qualifying Exam will only be determined by the CIS graduate faculty.
Ph.D. Qualify Exam Format:

Total of seven (7) topics: 2 core courses + 5 electives or 3 core courses + 4 electives. Candidates with A or A- scores in the selected courses are eligible to waive the examination of the corresponding topic.

There is no change to the formats of the Preliminary I, Preliminary II exams, or the Dissertation Defense.

There is no change to the format and rules governing the composition of the Ph.D. Dissertation Committee.

3. Impact on Faculty and Students

Faculty: Discussion of availability of faculty to support the program, including information about the hiring of new staff and faculty and/or reassignments of existing personnel (instructional deployment)

Students: Changes in requirements for admission to the program, plans for recruiting students, projection of the availability of qualified students, demand for revised program, and anticipated employment or advanced study opportunities for graduates of the program

The CIS Department is well positioned to support the proposed program with existing and newly hired faculty (Dr. Jie Wu, Chairman, Dr. Xiaojiang Du, Assistant Professor). One additional senior faculty for the same track may also be available.

There is no change in graduate admission requirements. The new faculty members have already brought approximately 10 new graduate students in this track. We expect approximately 5-10 new candidates each year for the new track.

Students completing the proposed program should be ready for advanced research and teaching in universities. They will also have credentials for employment in industry and government agencies.

4. Impact on Resources

Any changes in special tuition or fees to be charged. If graduate program, how will the students be supported?

Include campus(es) where the program will be offered.

The short- and long-term effects on other University programs, including increased or decreased demand for courses or services, loss or addition of students, student aid, Library, or computing resources, etc.

An analysis of the impact on space resources, including office, laboratory, and classroom space, must be included.
There is no change in tuition and fees. The graduate students will be supported by research grants and teaching assistantships when available.

The proposed program will be offered on Temple Main Campus, primarily in Wachman Hall. The CIS Department has already built a new research laboratory in Wachman 108 for the proposed program. Additional space is under investigation following the vacancy of the Accounts Payable Department on the 10th floor of Wachman Hall.

Computing and other resources will be covered by external research grants and the existing CIS laboratory budget.

The proposed program will have a positive impact on CIS graduate and undergraduate enrollments since the subject areas are essential to computer applications and research at all levels.

There will be some classroom impact due to potential enrollment increases. The CIS Department is prepared to handle the short term increases by using online learning tools.

The long term space needs will be handled with space in the new building for the College of Science and Technology.

5. Assessment

**What are the program goals (student learning outcomes)? How will student learning be evaluated? What will be considered evidence of student learning and success?**

The proposed program aims to produce Ph.D.'s capable of independent research and development in advanced computer and networking areas. The students will be continually evaluated at each stage by the quality of their conference and journal publications.

6. Implementation

**Provide an implementation plan with detailed chronology.**

Include full description of impact on enrolled students, describing options for, requirements to transfer to the new program, time limits for completion and other procedures.

Include draft copies of correspondence to be sent to students.

**Note:** If this restructuring will also involve renaming or restructuring of departments, please provide a description of the changes involved. Also include a listing of all faculty, by seniority, in their current departments and in the proposed structure.

We plan to launch the proposed program in the Fall semester of 2010.
In Fall 2009, CIS8537 was offered as a graduate seminar. CIS8536 and CIS8537 will be offered in Spring 2010 as graduate seminars. In Fall 2010, CIS9669, CIS8542*, CIS8539* and CIS8541* will also be offered. This allows students to take the Qualifying Exam in 2011.

**7. Process for Development of Proposal**

*List any collegial committees that reviewed, endorsed or approved proposal*

*Discuss how proposal relates to visiting team recommendations from most recent periodic program review*

*Describe any implications for accreditation Summary:*

The proposed program meets the recommendations of the CIS external review team to hire an external chairman and established senior research faculty to bootstrap our research and curriculum developments.

The proposed program will potentially qualify the CIS curriculum to be certified as a Center of Excellence for Information Security and Assurance by the National Security Agency.

The proposed program was approved by the CIS Graduate Committee in October 2009 and approved by the CIS Department on November 30, 2009.

**Contact:** Justin Y. Shi (shi@temple.edu), CIS Graduate Committee Chair