ISU A-3
Consent

# MEMORANDUM

**To:** Board of Regents

**From:** Board Office

**Subject:** Review of Iowa State University's proposal for an Interdepartmental Master of Science major in Information Assurance

**Date:** June 5, 2000

**Recommended Action:**

Refer the proposed graduate major for an Interdepartmental Master of Science in Information Assurance at Iowa State University to the Interinstitutional Committee on Educational Coordination (ICEC) and the Board Office for review and recommendation.

**Executive Summary:**

Iowa State University is requesting approval of an interdepartmental Master of Science major in Information Assurance. The proposed program will train students to become information security professionals.

The University states that there is need for such a major, in light of governmental and business concerns about computer viruses. The new degree program does not duplicate any program in the state; in fact, there are only six other similar programs nationwide. Coordinated by the Department of Electrical and Computer Engineering, the interdisciplinary degree program has a projected enrollment of 70 majors in five years, as well as 30 non-majors. Graduates would have many employment opportunities. Additional costs of approximately $20,000 are projected in two of the three first years of the program's offering.

The proposed Master's degree program is consistent with the strategic plans of the departments, the College of Engineering, and the University. Within the Department of Electrical and Computer Engineering, information security and networking is one of the nine research focus areas that has been targeted for growth.

**Background and Analysis**:

The growing need for information security is well documented. Few universities offer more than one cryptography course. There is a severe shortage of graduates proficient in the technology and policy issues critical to meeting personnel needs in this field. Employees are needed by academic institutions, government agencies, businesses, and in the private sector.

ISU currently offers a number of courses related to the field. The National Security Agency (NSA) has identified the University as one of only seven Centers of Excellence in Information Assurance in the United States.

The proposed program would have the following objectives: (1) to impart and enhance knowledge about information infrastructure security; (2) to expand and develop engineering abilities; (3) to instill and nurture social awareness, and the ability to function in a team; (4) to instill and nurture a sense of ethics; and (5) to develop an understanding of strategic and policy issues.

A typical program of study will consist of 11 credits from the core set of courses, six credits of research for a Master of Science with thesis or three credits of creative component for a Master of Science without thesis. The remaining courses will be taken from a set of elective courses.

All of the courses in the proposed major are currently being offered. The University believes that the introduction of a new major may increase enrollment in these courses, but not to a point at which they become impractical to teach. The Information Systems Security Laboratory (ISSL), housed in the Department of Electrical and Computer Engineering, maintains a 1,500 square foot research and teaching facility that will be used to support students doing research as well as supporting the courses.

No formalized study has been made to determine the estimated enrollment. Some current students are likely to transfer to the new major. The University indicates that the actual number will be determined by off-campus students who enroll in the program. Over the first five years of the program, ISU officials project that the number of majors will rise from 15 to 30, then 45, 60, and 70 in the fifth year. The number of non-majors is projected to rise during the five years, from five in Year One to 10 in Year Two, and up to 30 students by Year Five.

Few additional resources will be needed for the program. Some of the funds will be used for staff support. The majority of funds will be used for graduate student support. The estimated marginal increases are as follows:

| | Estimated | Incremental Costs | |
|---|---|---|---|
| | First Year | Second Year | Third Year |
| a. Faculty | | | |
| b. Graduate students | $8,000 | $16,000 | $16,000 |
| c. General expenses | $2,000 | $4,000 | $5,000 |
| d. Equipment | | | |
| e. Library resources | | | |
| f. New Space needs | | | |
| g. Computer use | | | |
| h. Other Resources | | | |
| Totals | $10,000 | $20,000 | $21,000 |

More detailed information is found in Attachment A, pages 4-7.

Charles R. Kniker
Charles R. Kniker

Approved: Frank J. Stork
Frank J. Stork

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# Regents Program Review Questions

**Degree:** Master of Science

**Major in:** Information Assurance

**1. Need**

**a. How will this proposed program further the educational and curriculum needs of the students in this discipline?**

According to the latest National Plan for Information Systems Protection released by the president of United States in January of 2000, "Defending America's cyberspace will require action by all Americans - Business leaders, education, and other private sector institutions, the government (Federal, state, and local), and ultimately, the general public. A foundation for the many actions outlined in the plan (National Plan for Information Systems Protection) is the understanding, and awareness of the new threats posed to our information systems, and the need for action".
Students graduating from the major proposed will help to fill the current and future needs for well-educated system security specialists in the government, private sector, and academia.

**b. How does it further the educational and curriculum needs of other units in the college or university?**

The new major will bring together several disciplines (Electrical and Computer Engineering, Computer Science, Mathematics, Industrial and Manufacturing Systems Engineering, Management Information Systems, Library Sciences) that are critical to solving the problems of securing the national infrastructure. Students from other disciplines will also benefit from the wide range of courses offered and by working with faculty in the area.

2.

**a. What programs in this field of study are available in other colleges and universities in Iowa?**

To the best of our knowledge, no programs in this field of study are available in Iowa. There are fewer than 10 programs in this field in the country.

**b. With what representatives of these programs have you consulted in developing this proposal?**

None

**c. In what ways is this proposed program similar to those mentioned in 2a?**

Not applicable

**d. How does the proposed program supplement the current programs available?**

Not applicable

**e. Has the possibility of some kind of interinstitutional program or other cooperative effort been explored?**

Not applicable

**f. List the Iowa institutions in which articulation agreements are being developed for the proposed program.**

Not applicable

**g. Provide the Classification of Instructional Program (CIP) code for the proposed program**

**3. Estimated enrollment for the program**

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| a. Undergraduate | NA | NA | NA | NA | NA |
| Majors | | | | | |
| Non-Majors | | | | | |
| b. Graduate | | | | | |
| Majors | 15 | 30 | 45 | 60 | 70 |
| Non-Majors | 5 | 10 | 20 | 25 | 30 |

**c. On what basis were these estimates made?**

There are several students who are in Computer Engineering and Computer Science who would transfer to the new major if it existed. We are getting inquiries from potential students from all across the country based on the Center of Excellence designation. The actual number will be determined the number of off campus students in the major. Several organizations from Des Moines and center Iowa have indicated an interest in the courses and a possible major.

**d. What are the anticipated sources of these students?**

Students will primarily from Iowa and the US, with some students from other countries.

**4. Employment opportunities**

The growing need for information security professionals is well documented. Very few universities offer more than a single cryptography course, and even fewer engineering departments have a presence in this area. The end result is a severe shortage of graduates proficient in the technology and policy issues critical to the security of the information infrastructure.

**5. Accreditation standards**

No professional accreditation exists in this new discipline. ISU has, however earned recognition from the national Security Agency. On 11 May 1999, NSA issued a Press Release designating seven universities as the first Centers of Excellence in Information Assurance under the Centers of Excellence Program. NSA granted the designations following a rigorous review of university applications against published criteria based on training standards established by the National Security Telecommunications and Information Systems Security Committee (NSTISSC).

NSA's establishment of this program was spurred by the growing demand for professionals with Information Assurance expertise in various disciplines. The Centers for Academic Excellence are expected to become focal points for recruiting and to create a climate to encourage independent research in Information Assurance.

Members of the program at ISU are involved in work at the national level to develop curricula for programs in Information Assurance. As the standards are being developed this program will be modified to remain current. As a CENTER OF EXCELLENCE school our set of courses are already being used as a model for others across the country.

**6. Does the proposed program meet minimal national standards for the program**

N/A

**7. Reaction of the Iowa Coordinating Council for Post-High School Education**

None as of 5/8/00

## Additional Resource Needs

1. **Estimated marginal increases in expenditure**

| | Estimated (Incremental) Costs | | |
|---|---|---|---|
| | First Year | Second year | Third year |
| a. Faculty | | | |
| b. Graduate Students | $8,000 | $16,000 | $16,000 |
| c. General Expense | $2,000 | $4,000 | $5,000 |
| d. Equipment | | | |
| e. Library Resources | | | |
| f. New Space needs | | | |
| g. Computer Use | | | |
| h. Other Resources | | | |
| Totals | $10,000 | $20,000 | $21,000 |

The incremental cost shown in years two and three are incremental costs compared to no program.

2. **Nature and justification for the additional resource needs.**

Iowa State University plans to become a national leader in the area of information assurance education and research. The proposed program builds on existing strengths in several departments and places Iowa State University in the forefront of this emerging area.

3. **Source of additional resources**

The administration of the major will rest with the faculty who are also members of the proposed center for Information Assurance. Resources from the center will be use to support the new major, including secretarial support. Departments responsible for teaching each course will provide faculty and appropriate TA support for that course.