

- 1. **Institution:** Illinois State University
- 2. **Responsible School:** School of Information Technology
- 3. **Program Title:** B. S. in Computer Science, Enterprise Computing Engineering Sequence
- 4. **CIPS Code:** 15.1212
- 5. **Proposed Data of Initiation:** Fall 2008
- 6. **Current and Proposed Catalog Copy**
(Changes noted in boldface)

Current Catalog Copy	Proposed Catalog Copy
MAJOR IN COMPUTER SCIENCE	
<p>The degree is designed for students who wish to pursue a comprehensive study of computer science that blends theory, abstraction, and design in a variety of traditional and current areas. Graduates will be prepared to work for a variety of companies including those that have a scientific, engineering, or mathematical focus. It would also prepare students to pursue graduate studies in Computer Science. The Computer Science program is accredited by the Computing Accreditation Commission (CAC) of the Accreditation Board for Engineering and Technology (ABET).</p>	<p>The degree is designed for students who wish to pursue a comprehensive study of computer science that blends theory, abstraction, and design in a variety of traditional and current areas. Graduates will be prepared to work for a variety of companies including those that have a scientific, engineering, or mathematical focus. It would also prepare students to pursue graduate studies in Computer Science. There are two sequences, the General Computer Science sequence, and the Enterprise Computing Engineering sequence, within this program. The General Computer Science sequence is designed for students who wish to pursue a broad education in computer science. The Enterprise Computing Engineering sequence is designed for students who wish to pursue both technical and practical skill in large-scale, multi-platform enterprise computing systems. The General sequence of the Computer Science program is accredited by the Computing Accreditation Commission (CAC) of the Accreditation Board for Engineering and Technology (ABET).</p>

	Enterprise Computing Engineering Sequence:
	<p>The Enterprise Computing Engineering sequence is designed for students who are interested in the areas of computer architecture, networking, and performance analysis and improvement. This sequence prepares students for system programmer/analyst positions in a large scale enterprise computing environment.</p>

	Computer Science courses: (47 – 49 hours):
	Computer Science core (10 hours): — ITK 160, 168, 261.
	Professional Practice (7 hours): — ITK 191. — 1 of 2 options — 6 hours of ITK 398, or — 3 hours of ITK 391 and 3 hours of ITK 398.
	Other ITK course requirements (30 – 32 hours): — ITK 179, 225, 279, 330, 331, 332, 394. — 2 of: ITK 272, 372, 378, 382, 383. — 1 of ITK 326, 327, 340, 363, 382, 383, 384, 385, 388. (if not used to satisfy other requirements)
	Supporting requirements (36 – 38 hours):
	Mathematics and Statistics (15 – 16 hours): — MAT 145, 146, 260. — 1 of: MQM 100; MAT 350
	Communication (6 hours): — COM 223; ENG 249.
	Science (15 – 16 hours) — 1 pair of: CHE 140, 141; or PHY 110, 111 — 2 additional courses from: BSC 196, 197; CHE 140, 141; PHY 110, 111, 112, 375.

Description of the program

1. The Enterprise Computing Engineering (ECE) sequence focuses on the implementation and development of integrated large-scale computing systems for enterprise businesses. There are two major areas in the study of enterprise computing systems, one is the study of the infrastructure of the systems and the other is the study of integration of the systems. The ECE sequence concentrates on infrastructure areas such as computing component organization, system structure and setup, performance evaluation and analysis. The fundamental courses of this area for students to take are similar to the basic courses taken by all students majoring in Computer Science, thus there are significant basic course overlaps between the General sequence and the ECE sequence. After students complete the basic courses, they will continue taking the ECE specific courses (described below) and further concentrate on the infrastructure of the integrated large scale enterprise computing systems.
2. Four new ECE specific courses are proposed for the sequence. They are:
 - a. ITK 330 – Introduction to Enterprise Computing Systems;
 - b. ITK 331 – Operating, Data Communications, Networking, and Security of Enterprise Systems;

- c. ITK 332 – Advanced Enterprise Computing Systems;
- d. ITK 394 – Enterprise System Architecture and Performance Analysis.

Rationale

The study of the local and national IT business indicates that the current mainframe system programmers and system administrators are reaching retirement age and the demand for personnel to replace these employees will be high. In addition, a study of global computing markets shows that mainframe use continues to rise. From both economic (such as power consumption, floor footage, and system maintenance) and business integration (centralized computing and storage system with distributed recovery strategy) points of view, the number of integrated large-scale enterprise computing systems will continue to grow in both major corporations and in small to medium businesses. The school has had many meetings with both local and regional companies, e.g., State Farm, Caterpillar, John Deere, Anheuser-Busch, Allstate, and others. All of these companies have encouraged ITK to offer enterprise systems computing education and have indicated they will support such a program and hire its graduates. IBM has also offered support in terms of educational opportunities for faculty, equipment, and support in student recruiting and placement. The establishment of an Enterprise Computing Engineering sequence in the Computer Science degree program will place ISU in a leading edge position in both education and research related to large-scale integrated multi-platform computing systems.

Consequences of Proposed Changes

1. Expected impact of proposal on existing campus programs:

No impact on existing campus programs.

2. Expected curricular changes:

The Enterprise Computing Engineering sequence will utilize a major portion of the courses offered by three existing ITK programs. To achieve the objective of learning about large-scale multi-platform enterprise computing systems, four new courses are added to the sequence. They are:

- a. ITK 330 – Introduction to Enterprise Computing Systems;
- b. ITK 331 – Operating, Data Communications, Networking, and Security of Enterprise Systems;
- c. ITK 332 – Advanced Enterprise Computing Systems;
- d. ITK 394 – Enterprise System Architecture and Performance Analysis.

Students are required to complete all four courses before graduation. The remaining major requirement courses are currently offered by ITK on a regular basis.

3. Library resources:

Since this sequence is within the scope of the existing ITK Computer Science program, no additional library material should be required.

4. Staffing arrangements:

This sequence will start teaching the ITK 330 course (joint course with the Information Systems, IES sequence) each semester for the first year, one to two courses (joint courses with the Information Systems, IES sequence) per semester in the second year, and up to three courses (two joint courses with the Information Systems, IES sequence) per semester in subsequent years. ITK recruited a faculty member for these sequences in fall semester 2007, with no anticipated need for additional faculty in the next four to five years.

5. Funding needs:

We are using an academic partition (LPAR) on the university's IBM mainframe for all the course work. IBM is donating all of the software and some of the hardware as well as equipment installation and upgrade support, so we have no equipment needs. IBM also provides free faculty and staff training through their Academic Initiative program, and offers additional training in specific areas which can be completed on-line. IBM has provided a z890 mainframe system in the summer of 2007 for ITK to conduct both education and research.