The Changing Information Systems (IS) Curriculum: A Survey of Undergraduate Programs in the United States

MABEL KUNG
SAMUEL C. YANG
YI ZHANG
CALIFORNIA STATE UNIVERSITY
FULLERTON, CALIFORNIA

ABSTRACT. The core curriculum of information systems (IS) is vital to the IS field. It serves as a base of knowledge that all IS graduates should possess. Within academic and practitioners' communities, there have been constant discussions about the content of the IS core curriculum. In this article, the authors used a direct survey strategy to examine all undergraduate IS programs offered by business schools in the United States. The survey presents the core curricula of undergraduate IS programs based on accreditation criteria and the most recent IS curriculum model, IS 2002. The authors also compared the current results with those obtained 10 years ago in a separate study (J. L. Maier & S. Gambill, 1996). The research established the current baseline of undergraduate IS curricula and showed how the curricula have changed in the past decade. Information provided in this article should be valuable to IS educators and curriculum designers, as well as IS practitioners, to better understand the foundational knowledge transmitted to IS graduates.

Despite the intense media coverage of the outsourcing of information systems (IS) jobs, the outlook for IS occupations in the United States remains strong. According to the Bureau of Labor Statistics (Horrigan, 2004), seven IS-related occupations (e.g., computer systems analysts, database administrators) will be among the top 30 fastest-growing occupations in the United States between now and 2012. Management of information systems (MIS) and computer information systems (CIS) departments in higher education are responsible for training future IS professionals. Thus, the design of the core IS curriculum in IS departments is crucial for preparing quality candidates for the information technology (IT) industry.

To keep up with the fast-changing world of information technologies, IS undergraduate programs in business schools need to be assessed regularly in terms of curricula and teaching methods (Tatnall & Davey, 2004). For this purpose, the accreditation process exists to help develop and promote academic standards. Accreditation provides assurance that graduates meet certain minimum standards, qualifying them for professional practice and further academic studies, and assures that some uniformity in education is maintained (Stettler, 1965). Societal and government agencies throughout the world use accreditation to establish standards of quality in educational institutions and programs (Gorgone & Gray, 2002; Impagliazzo & Gorgone, 2002). Business schools worldwide recognize the International Association to Advance Collegiate Schools of Business (AACSB International) and the international European Quality Improvement System (EQUIS) as accrediting bodies for business colleges and schools. The Accreditation Board for Engineering and Technology (ABET) has been accrediting engineering programs for over 70 years and, after integrating with the Computer Science Accreditation Board (CSAB), ABET started accrediting computer science programs in 2001 and IS programs in 2002. The requirements of ABET are applicable to any well-run IS program for delivering a quality curriculum to IS students (Challa, Kasper, & Redmond, 2005).

In addition to accreditation, which serves a monitoring and assessment role, scholars in the IS field also design curriculum models to help IS departments in various institutions develop their curricula. One major goal of the Association for Computing Machinery (ACM) and other professional societies, such as the Association for Information Systems (AIS), is to develop model curricula for IS. IS '95 (Couger, Davis, Dologite, & Feinstein, 1995) was the first version of the model curriculum

developed by a combined effort of both the ACM and the Data Processing Management Association (now the Association for Information Technology Professionals or AITP). The IS '95 model curriculum was then presented at various IS conferences for input and review. Suggestions and feedback to IS '95 were incorporated into IS '97 (Davis, Gorgone, Couger, Feinstein, & Longenecker, 1997). The most recent curriculum model is IS 2002 (Gorgone, Davis, Valacich, Topi, Feinstein, & Longenecker, 2002).

Because the IS curriculum needs to be updated frequently to keep up with the requirements of the field (Gill & Hu, 1999; Lee, Koh, Yen, & Tang, 2002; Lee, Trauth, & Farwell, 1995; Maier & Gambill, 1996), it is important to provide the field with an up-to-date description of the IS curriculum. The most recent study in this area that we found was a 1996 study of undergraduate programs in the United States, reported in 1999 (Gill & Hu). Given the dramatic changes in the IS field in the past 10 years, a comprehensive and up-to-date description of undergraduate IS curricula is urgently needed.

Our purpose in this study was to survey core courses currently taught in undergraduate IS programs within business schools in the United States. We categorized the courses based on the guidelines from both IS 2002 (Gorgone et al.) and standards listed under the 2004–2005 Criteria for Undergraduate Information Systems Programs (ABET, 2004). In addition, we provide a comparison between the current IS programs and those of 10 years ago.

Course Framework

We used both ABET criteria (ABET, 2004) and the IS 2002 curriculum model (Gorgone et al.) to derive the course framework that guided our data collection. We used ABET criteria because they are a set of commonly-accepted criteria in IS education (Challa et al., 2005). The Computing Accreditation Commission under ABET established two sets of criteria: one applicable to Computer Science (CS) programs and one applicable to IS programs. Because we focused on IS core requirements in business schools, we used the IS criteria. The purpose of ABET's IS criteria is:

> to combine professional requirements with general education requirements and electives to prepare students for a professional career in the information systems field, for further study in information systems, and for functioning in modern society. The professional requirements include coverage of basic and advanced topics in information systems as well as an emphasis on the information systems environment. Curricula are consistent with widely recognized models and standards. (2004, section IV)

Appendix A lists the entire criteria for accrediting IS programs (ABET).

In addition to accreditation bodies, different associations in the IS community have regularly updated IS curriculum models to guide various institutions in the design of their own curricula. The most recent model is the IS 2002 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information System (Gorgone et al., 2002), which was a collaborative effort by ACM, AIS, and AITP. All three organizations have worldwide membership. In particular, personal productivity with IS technology is the prerequisite knowledge for the IS curriculum presentation areas. Communications, qualitative and quantitative analysis, and organizational functions highlight the part of the program taught by faculty in other functional areas or other academic units. Similarities between the ABET criteria and IS 2002 exist. Appendix B shows the requirements of IS programs from both ABET and IS 2002.

In addition, IS 2002 provides a list of courses as building blocks that implement the broad curriculum presentation areas (see Gorgone et al., 2002). Gorgone et al. highlighted the course architecture and sequence of courses within IS 2002, including the prerequisite course IS 2002.P0. By comparing Gorgone et al.'s course sequence with ABET's core material requirements for information systems, one can map the basic coverage of the hardware and software to IS 2002.4; a modern programming language can be mapped to IS 2002.5; data management can be mapped to IS 2002.8; networking and telecommunications can be mapped to IS 2002.6; analysis and design can be mapped to IS 2002.7; and role of information systems in organizations can be mapped to IS 2002.9 and IS 2002.10, which are normally presented as a single capstone course in IS that integrates knowledge students have acquired in the IS program. On the basis of both standards, we derived a list of courses that serves as core requirements in IS programs (see Table 1). We used the resulting course categories to survey the current state of core requirements in IS programs across the United States.

METHOD

We used a direct survey of undergraduate IS programs in the United States to collect data on IS curricula. The advantage of a direct survey is that it focuses on a specific program of interest (i.e., undergraduate), allows collection of data in a systematic way, and facilitates standard quantification of data. Hence, this methodology provides a comprehensive view of the current undergraduate IS programs in the United States.

Scope

We focused on undergraduate IS programs in business schools. The goal was to select schools from the largest sample possible. Because quality IS programs can be offered by schools that are not accredited by, for example, AACSB International, we used IS and MIS programs from *The College Blue Book*, 30th edition (Quick, 2003) as our repository and looked for institutions that offer a bachelor's degree in IS, MIS, or CIS as a major. We used the following criteria in choosing the final sample: (a) The undergraduate IS program had to reside within a business school or a business division of the university; (b) the university had to offer the IS undergraduate degree as a major, not as a concentration; and (c) the undergraduate IS program had to culminate with a bachelor's degree.

In addition, we included only undergraduate IS programs offered by traditional 4-year universities. Among over 1,000 institutions (which included community colleges) on the list shown to have undergraduate IS programs, 232 institutions fit the study criteria.

TABLE 1. Core Courses Offered in Information Systems (IS) Programs

Course category	Corresponding ABET[a] requirement	Corresponding IS 2002 course[b]
Introduction to IS	Role of information systems in organizations	IS 2002.1 and IS 2002.3
Operating Systems	Basic coverage of the hardware and software	IS 2002.4
Systems Analysis and Design	Analysis and design	IS 2002.7
Programming	A modern programming language	IS 2002.5
Database	Data management	IS 2002.8
Telecommunications	Networking and telecommunications	IS 2002.6
IS Capstone Course (Seminar in IS)	NA	IS 2002.9 and IS 2002.10

[a]Accreditation Board for Engineering and Technology. [b]IS 2002 model curriculum. IS 2002 model from J. T. Gorgone, G. B. Davis, J. S. Valacich, H. Topi, D. L. Feinstein, and H. E. Longenecker, Jr., 2002, *IS 2002: Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems*, http://www.is2002.org.

Survey

Using published university catalogs from these schools, we examined the core curricula of the 232 undergraduate IS programs to analyze program core requirements (i.e., courses that are required by all graduates of the major). For each program, we attempted to answer the following questions using the direct survey: (a) Is the university public or private? (b) What does the program offer in terms of the core course categories shown in Table 1? and (c) If programming is a core requirement, what programming language(s) does the program offer?

Because catalog publication sometimes lags an actual change in degree requirements, if there was a difference between the degree requirements shown in the catalog and those shown on the department's Web site, we used the degree requirements posted on the department's Web site.

Sample

In the sample, we included all 232 universities with 4-year programs in IS offered under business schools. The sample contained educational institutions representing every geographical region in the United States.

RESULTS

Among the 232 programs surveyed, 142 (60%) were public institutions whereas 90 (40%) were private institutions. One hundred and forty out of 232 business programs were AACSB-accredited. Among these programs, we found a great deal of consistency with respect to core course content. We fit the core courses of IS programs surveyed into the seven course categories listed in Table 1. Table 2 shows the numbers and percentages of institutions offering the seven course categories.

As shown in Table 2, there was little difference in the percentages of public and private universities offering courses in the seven course categories. For example, 61% of public universities offered a core course in Introduction to IS, and 61% of private universities also offered a core course in Introduction to IS. Ninety two percent of public universities offered a core course in system analysis and design and 96% of private universities offered a core course in system analysis and design. Telecommunications was the category that had the largest difference in percentage: 76% of public institutions offered a core course related to telecommunication whereas only 63% of private institutions offered it as a core requirement.

Table 3 shows the most common core course offerings in IS programs. Systems analysis and design, database, and telecommunications are the top three most common core courses, with 94% of the sample institutions requiring a core course in systems analysis and design, 92% in database, and 71% in telecommunications. In terms of introduction to IS, it was surprising that only 61% of the schools offered an introduction to IS as a required course. In most of the schools that offered it, introduction to IS was listed as a business school general core requirement; the course may be covered in community colleges and could be transferred. In addition, with the exception of a couple of language-specific programming courses (i.e., C++ and Java), operating systems was the least frequently offered core course.

In terms of programming courses, 60% of institutions surveyed offer a core course in programming but did not state the language used in the course. Among those institutions that stated the specific language used in their core programming course in the catalog, 20% offered a core course in COBOL, 20% offered a core course in Visual Basic (VB), and 12% and 10% of sample institutions required a core course in C++ and Java, respectively. However, the actual percentages of institutions offering COBOL, VB, C++, and Java may be understated because, as mentioned, the course catalogs for many schools that required a core course in programming did not explicitly state the language used in the course. We categorized these courses as programming (general).

In terms of the capstone course, 47% of institutions surveyed required an IS capstone core course. Capstone courses are offered under a variety of course titles. Seminar in Information Systems and Information Resource Management are often used as capstone course titles. Many institutions also incorporate internships into their capstone courses. Although capstone courses often involve projects, we excluded those

TABLE 2. Institutions Offering the Seven Information Systems (IS) Course Categories

Course category	Institution: Public *n*	Public %	Private *n*	Private %	Total *n*	Total %
Introduction to IS	85	61	56	61	141	61
Systems Analysis and Design	129	92	88	96	217	94
Programming	126	90	78	85	204	88
Database	129	92	85	92	214	92
Telecommunications	106	76	58	63	164	71
Operating Systems	18	13	19	21	37	16
IS Capstone Course	68	49	42	46	110	47

TABLE 3. The Most Common Core Courses Offered in Information Systems (IS) Programs, by Percentage of Programs Offering the Course

Course name	%
Introduction to IS	61
Operating Systems	16
Systems Analysis and Design	94
Programming	
General	60
COBOL	20
Visual Basic (VB)	20
C++	12
Java	10
Database	92
Telecommunications	71
IS Capstone Course	47

internship-only courses from the IS capstone course category, because a capstone course should also integrate other aspects of IS skills.

We ascertained how undergraduate IS programs in the United States have changed in the past 10 years by comparing our results with those obtained 10 years ago by Maier and Gambill (1996), who stated in their study that their goal was "to establish a baseline from which comparisons can be made" (p. 330). We used their results as a baseline and Table 4 shows the summary of our comparison.

In terms of the most common courses, database courses have continued to be popular, with 91% of the institutions offering such a course in 1995 and 92% offering it in 2005 (see Table 4). In addition, systems analysis and design has become more important in the IS curriculum. The percentage of schools offering this course has increased from 61% in 1995 to 94% in 2005. By contrast, the percentage of schools offering telecommunications or data communications has dropped from 81.4% in 1995 to 71% in 2005. The percentage of schools offering a course in introduction to IS has increased from 40% in 1995 to 61% in 2005. Conversely, operating systems have declined in importance; the percentage of institutions offering a core course in operating systems has dropped from 30% in 1995 to 16% in 2005. In terms of capstone courses, the percentage of institutions offering a capstone course has grown from 30% in 1995 to 47% in 2005.

In terms of the programming languages, because 60% of IS programs surveyed offered a general programming core course but did not state the programming language used in the course, we could not make strict comparisons between 1995 and 2005. Nevertheless, some directions in trends can be observed. VB appears to have risen in popularity, from 4.7% in 1995 to 20% in 2005. However, the actual VB offering in 2005 may be much higher because some universities that did not specify the language used in their core programming courses in their catalogs could have used VB. Although VB rose in popularity, COBOL dropped from 72.1% in 1995 to 20% in 2005.

DISCUSSION

Programming Languages

Most IS programs (88%) offered a programming language as a core requirement and many schools required more than one programming course. This result shows that IS programs in the United States are responding to the call of practitioners. Most of the schools (60%) in our sample did not specify the programming language used for their programming courses. Among the schools that explicitly specified which programming languages they offer in their core requirements, both COBOL and VB were on top of the list. COBOL remains surprisingly popular, offered by 20% of the universities surveyed. VB was also offered by 20% of the universities surveyed. Whether COBOL should continue to have a strong presence in business computing is still under debate. COBOL has been reported as the king of custom applications until the early 1990s (Ehie, 2002; Fougere, Laurie, & Kenneth, 2003; Maier & Gambill, 1996). However, since enterprise applications and Web technologies became popular, the business world has no longer relied on custom applications (Babcock, 2003; Hayers, 2002; Laudon & Laudon, 2004). In addition, Ruby (2005) used a questionnaire to measure faculty attitudes toward COBOL and its place among other programming languages in the AACSB Business College Curriculum. Ruby showed that COBOL was less popular than were VB, Java, and C++, a result that is different from ours. Although our study had a larger sample size than did Ruby's study, the difference might be due to the method we used. Because we did not survey individual instructors, we placed in the general programming category those programming courses that did not specify a language.

Besides COBOL, VB is also a very popular core programming course in business schools, a result which was confirmed by Ruby's (2005) study. This might be because VB was a simpler language than C++ and Java, and most simple business applications in the 1990s were written in VB. Although Java and C++ were less popular than both VB and COBOL, many schools offered Java and C++ as electives.

Capstone Course

IS jobs require not only technical knowledge but also communication and

TABLE 4. The Most Common Information Systems (IS) Courses in 1995 and 2005, by Percentage of Institutions Offering the Course

Course category	% 1995	2005
Introduction to IS[a]	39.5	61
Operating Systems	30.2	16
Systems Analysis and Design[b]	60.5	94
Programming		
General[c]	NA	60
COBOL[d]	72.1	20
Visual Basic (VB)	4.7	20
C++[e]	44.2	12
Java[c]	NA	10
Database[f]	90.7	92
Telecommunications[g]	81.4	71
IS Capstone Course (Seminar in IS)[h]	30.2	47

Note. 1995 data taken from "CIS/MIS Curriculums in AACSB-Accredited Colleges of Business," by J. L. Maier and S. Gambill, 1996, *Journal of Education for Business, 71*(6), 329–333. Copyright 1996 by Heldref Publications; NA = not available.
[a]Known as IS Concepts in 1995; [b]Known as systems analysis and design combined in 1995; [c]This course does not have a 1995 equivalent; [d]Known as COBOL I in 1995; [e]Known as C/C++ in 1995; [f]Known as DBMS Concepts I in 1995; [g]Known as data communications in 1995; [h]Known as information resource management in 1995.

interpersonal and organizational skills (Davis, 2003; Medlin, Dave, & Vannoy, 2001). IS curricula try to meet this need by offering a capstone course that helps students acquire the skills mentioned; capstone courses typically require students to do a team project that involves implementing an IS solution for a business problem using technical knowledge, communication skills, teamwork skills, and presentation skills. Almost half (47%) of the programs we surveyed included a capstone course as part of the core curriculum. Some schools do not have a capstone course, but they require students to take an internship during their senior year of study instead.

Changes in IS Programs

We expected the increase in schools offering introduction to IS. This increase reflects the growing importance of IS in all business disciplines. More business schools are now requiring all of their business students to take an introductory IS course that is offered by the IS program in the business school.

Although the results show the growing importance that schools assign to capstone courses, it is surprising that the percentage of schools offering an IS capstone course is still a minority. The integrative project assignments frequently required in capstone courses train students to use both organizational skill and technical skill to carry out real-world projects, and the capstone course is often where various concepts of IS integrate and converge in a program of study. However, the literature continues to echo a serious concern about the lack of emphasis on the concept of an IS capstone course in undergraduate curricula (Cope, 2002; Cope & Horan, 1998; Weber, 1996). Given that only a minority of IS programs offer capstone as a core course, IS programs in the United States should work toward increasing their offerings of capstone course in their core curricula.

The increase in the popularity of VB as a programming language may be due to the popularization of object-oriented programming and the fact that VB is a relatively simple language for instruction. Conversely, the drop in COBOL programming courses was understandable. The large number of institutions offering COBOL in 1995 was due to the year 2000 concerns and the need for COBOL programmers; the marketplace needed more COBOL programmers in the late 1990s because businesses and organizations were rushing to make their information systems year 2000 compliant.

All in all, the contents of undergraduate IS curriculum have changed, as expected, because of technological evolution, market demand, and the desire to produce graduates who can successfully function in a business and team setting. One surprising result is the drop in the percentage of programs that offer telecommunications or data communications. The decrease has occurred as networks are playing an integral role in today's business environments. Organizations are increasingly using networks to integrate their supply chains upstream and distributors or customers downstream. In fact, the Bureau of Labor Statistics estimates that among the top 30 fastest-growing occupations through 2012, network administrators and network analysts are ranked number 12 and number 13, respectively, even ahead of the occupation of database administrators (Horrigan, 2004). Therefore, undergraduate programs in IS should carefully consider their offerings in telecommunications and networking to adequately address the demands of this specialty.

In comparing our study with that of Maier and Gambill (1996), we recognized that there were limitations in the comparisons. First, the course names used 10 years ago by Maier and Gambill were slightly different from the course names that we used. Thus, we made comparisons between the closest course categories. Second, the methodologies used by the two studies were also different. Maier and Gambill used a questionnaire to survey IS department chairs, whereas we directly obtained information from catalogs of business schools. Nevertheless, it is useful to make such comparisons to qualitatively assess how the overall IS curriculum has changed in the past 10 years.

Given the results of our study, it is reasonable to conclude that undergraduate IS programs in the United States are diverse and dynamic in their contents covered and emphasized. Because of the need and the dynamic nature of the IS discipline, studies of the skills required by industry professionals lead to the

continuous comparisons of IS curricula (Gill & Hu, 1999; Martz & Landof, 2000). This article represents a step toward better understanding the change in and the current state of undergraduate IS programs.

NOTE

Correspondence concerning this article should be addressed to Samuel C. Yang, Department of Information Systems and Decision Sciences, California State University, 800 North State College Boulevard, Fullerton, CA 92834.
E-mail: syang@fullerton.edu

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APPENDIX A
Criteria for Accrediting Information Systems Programs: Effective for Evaluations During the 2004–2005 Accreditation Cycle
(Accreditation Board for Engineering and Technology, 2004)

I. Objectives and Assessments

Intent

The program has documented educational objectives that are consistent with the mission of the institution. The program has in place processes to regularly assess its progress against its objectives and uses the results of the assessments to identify program improvements and to modify the program's objectives.

Standards

I-1. The program must have documented educational objectives.
I-2. The program's objectives must include expected outcomes for graduating students.
I-3. Mechanisms must be in place to periodically review the program and the courses.
I-4. The results of the program's assessment must be used to help identify and implement program improvement.
I-5. The results of the program's review and the actions taken must be documented.

appendix continues

APPENDIX A—*Continued*

II. Students

Intent

Students can complete the program in a reasonable amount of time. Students have ample opportunity to interact with their instructors and are offered timely guidance and advice about the program's requirements and their career alternatives. Students who graduate the program meet all program requirements.

Standards

II-1. Courses must be offered with sufficient frequency for students to complete the program in a timely manner.
II-2. Information systems programs must be structured to ensure effective interaction between teaching faculty and students.
II-3. Advising on program completion, course selection, and career opportunities must be available to all students.
II-4. There must be established standards and procedures to ensure that graduates meet the requirements of the program.

III. Faculty

Intent

Faculty members are current and active in the discipline and have the necessary technical breadth and depth to support a modern information systems program.

Standards

III-1. The interests, qualifications, and scholarly contributions of the faculty members must be sufficient to teach the courses, plan and modify the courses and curriculum, and to remain abreast of current developments in information systems.
III-2. All faculty members must have a level of competence that would normally be obtained through graduate work in information systems.
III-3. A majority of the faculty members should hold terminal degrees. Some full-time faculty members must have a PhD in information systems or a closely related area.
III-4. All faculty members must remain current in the discipline.

IV. Curriculum

Intent

The curriculum combines professional requirements with general education requirements and electives to prepare students for a professional career in the information systems field, for further study in information systems, and for functioning in modern society. The professional requirements include coverage of basic and advanced topics in information systems as well as an emphasis on an IS environment. Curricula are consistent with widely recognized models and standards.

Standards

Curriculum standards are specified in terms of semester-hours of study. Thirty semester-hours generally constitutes one year of full-time study and is equivalent to 45 quarter-hours. A course or a specific part of a course can only be applied toward one standard.

General:

IV-1. The curriculum must include at least 30 semester-hours of study in information systems topics.
IV-2. The curriculum must contain at least 15 semester-hours of study in an information systems environment, such as a business.

appendix continues

APPENDIX A—*Continued*

IV-3. The curriculum must include at least 9 semester-hours of study in quantitative analysis as specified below under quantitative analysis.
IV-4. The curriculum must include at least 30 semester-hours of study in general education to broaden the background of the student.

Information Systems:

IV-5. All students must take a broad-based core of fundamental information systems material consisting of at least 12 semester hours.
IV-6. The core materials must provide basic coverage of the hardware and software, a modern programming language, data management, networking and telecommunications, analysis and design, and role of IS in organizations.
IV-7. Theoretical foundations, analysis, and design must be stressed throughout the program.
IV-8. Students must be exposed to a variety of information and computing systems and must become proficient in one modern programming language.
IV-9. All students must take at least 12 semester hours of advanced course work in information systems that provides breadth and builds on the IS core to provide depth.

Information Systems Environment:

IV-10. The 15 semester-hours must be a cohesive body of knowledge to prepare the student to function effectively as an IS professional in the IS environment.

Quantitative Analysis:

IV-11. The curriculum must include at least 9 semester-hours of quantitative analysis beyond pre-calculus.
IV-12. Statistics must be included.
IV-13. Calculus or discrete mathematics must be included.

Additional Areas of Study:

IV-14. The oral and written communications skills of the student must be developed and applied in the program.
IV-15. There must be sufficient coverage of global, economic, social and ethical implications of computing to give students an understanding of a broad range of issues in these areas.
IV-16. Collaborative skills must be developed and applied in the program.

V. Technology Infrastructure

Intent

Computer resources are available, accessible, and adequately supported to enable students to complete their course work and to support faculty teaching needs and scholarly activity.

Standards

V-1. Each student must have adequate and reasonable access to the systems needed for each course.
V-2. Documentation for hardware and software must be readily accessible to faculty and students.
V-3. All faculty members must have access to adequate computing resources for class preparation and for scholarly activities.
V-4. There must be adequate support personnel to install and maintain computing resources.
V-5. Instructional assistance must be provided for the computing resources.

appendix continues

APPENDIX A—*Continued*

VI. Institutional Support and Financial Resources

Intent

The institution's support for the program and the financial resources available to the program are sufficient to provide an environment in which the program can achieve its objectives. Support and resources are sufficient to provide assurance that an accredited program will retain its strength throughout the period of accreditation.

Standards

VI-1. Support for faculty must be sufficient to enable the program to attract and retain high-quality faculty capable of supporting the program's objectives.
VI-2. There must be sufficient support and financial resources to allow faculty members to attend national technical meetings with sufficient frequency to maintain competence as teachers and scholars.
VI-3. There must be support and recognition of scholarly activities.
VI-4. There must be office support consistent with the type of program, level of scholarly activity, and needs of the faculty members.
VI-5. Adequate time must be assigned for the administration of the program.
VI-6. Upper levels of administration must provide the program with the resources and atmosphere to function effectively with the rest of the institution.
VI-7. Resources must be provided to acquire and maintain laboratory facilities that meet the needs of the program.
VI-8. Resources must be provided to support library and related information retrieval facilities that meet the needs of the program.
VI-9. There must be evidence of continuity of institutional support and financial resources.

VII. Program Delivery

Intent

There are enough faculty members to cover the curriculum reasonably and to allow an appropriate mix of teaching and scholarly activity.

Standards

VII-1. There must be enough full-time faculty members with primary commitment to the program to provide continuity and stability.
VII-2. Full-time faculty members must oversee all course work.
VII-3. Full-time faculty members must cover most of the total classroom instruction.
VII-4. Faculty members must remain current in the discipline.
VII-5. All full-time faculty members must have sufficient time for scholarly activities and professional development.
VII-6. Advising duties must be a recognized part of faculty members' workloads.

VIII. Institutional Facilities

Intent

Institutional facilities including the library, other electronic information retrieval systems, computer networks, classrooms, and offices are adequate to support the objectives of the program.

Standards

VIII-1. The library that serves the information systems program must be adequately staffed with professional librarians and support personnel.
VIII-2. The library's technical collection must include up-to-date textbooks, reference works, and publications of professional and research organizations.
VIII-3. Systems for locating and obtaining electronic information must be available.
VIII-4. Classrooms must be adequately equipped for the courses taught in them.
VIII-5. Faculty offices must be adequate to enable faculty members to meet their responsibilities to students and for their professional needs.