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A Survey of ABET Accredited Information Systems Undergraduate Programs in the USA

Stephen Larson,
stephen.larson@sru.edu

Maria C. R. Harrington
maria.harrington@sru.edu

Computer Science Department
Slippery Rock University
Slippery Rock, PA 16057

Abstract

This paper contains the results of a survey of the 36 ABET accredited undergraduate programs in Information Systems (IS) from 2012 in the USA. With the goal of discovering the makeup of a typical ABET accredited IS program, each educational institution's website was searched for applicable information about its undergraduate program for information systems. The information gathered will be useful for institutions desiring to start the accreditation process, or for those modify their existing IS program, and for schools wishing to compare their program with accredited programs.

Keywords: ABET, accreditation, education, information systems, curriculum

1. INTRODUCTION

A common opinion to ensure competitiveness in an academic program is to maintain current and relevant curriculum, arguably important in a fast changing field such as IS, (Gill and Hu, 1999; Lee, Trauth, and Farwell, 1995; Maier and Gambill, 1996). Many postulate that one way to accomplish this goal is through a rigorous external accreditation process, which requires evaluation of and improvements to curriculum (Lending and Mathieu, 2010). The Association for Computing Machinery (ACM) states in its 2010 Curriculum Guidelines for Undergraduate Degree Programs in Information Systems that "university-level Information Systems curricula need frequent updating to remain effective," (ACM 2010). This frequent updating, especially to that which is relevant, meaningful and important to the study and practice of IS and in the larger political, economic, social, cultural and ethical environment, is a common requirement to attain and maintain competitiveness and theoretically, accreditation.

Many universities have attained the ABET accreditation for their 4-year undergraduate IS programs to help achieve this goal. ABET accreditation requires fulfilling several criteria concerning students and student learning outcomes, program educational objectives, continuous improvement, faculty, facilities, institutional support, and curriculum. The ABET 4-year undergraduate IS curriculum is the focus of this paper.

"Graduates from accredited programs know they are products of a program that professionals have evaluated and as a result, they will be better prepared to meet the challenges they will face in their careers," (Impagliazzo and Gorgone 2002). ABET accreditation is one of the foremost accreditations for IS programs. The ABET curriculum criteria require that:

"[T]he curriculum must combine technical and professional requirements with general education requirements and

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electives to prepare students for a professional career and further study in the computing discipline associated with the program, and for functioning in modern society.

The technical and professional requirements must include at least one year of up-to-date coverage of fundamental and advanced topics in the computing discipline associated with the program. In addition, the program must include mathematics appropriate to the discipline beyond the pre-calculus level. For each course in the major required of all students, its content, expected performance criteria, and place in the overall program of study must be published" (ABET 2012a).

Our motivation was to evaluate our curriculum against a benchmark. But as of June 2012, ABET lacked a published core IS curriculum. Thus we organized and analyzed all courses across all 36 ABET accredited 4-year undergraduate IS programs (BA and BS), in the US. To discover the makeup of a typical accredited program, a review of all 36 of the ABET accredited undergraduate programs in IS was conducted. The survey intended to answer questions such as the following:

• How long has the program been accredited?
• Are there other accredited programs at the school?
• What types of major courses make up the core curriculum?
• Is the program divided into tracks or concentrations?

This information would be useful for departments offering an undergraduate IS program that wishes to measure their own program against accredited programs, or as a starting point for schools intending to attain accreditation for their program.

Accreditation Review

"Accreditation is proof that a collegiate program has met certain standards necessary to produce graduates who are ready to enter their professions," (ABET 2012b). ABET has been accrediting IS programs since 2002. In addition to serving as a monitoring and assessment tool, accreditation also helps IS departments refine curricula.

Because accreditation processes and standards change periodically, studies concerning accreditation were found in prior literature.

Jacobson, Kasper, Mathieu, McFarland, and Meservy (2011) presented general principles for assessing information systems programs and methodologies and tools for benchmarking student learning. Departments usually focus on the assessment of the programs; Jacobson's study expounds upon the subject by offering an approach for measuring a benchmark from which to assess progress and learning. Related to Jacobson et al's work, "the Center for Computing Education Research (CCER) has provided a direct assessment tool for IS educators to determine if students have achieved specific outcomes identified in ACM model curriculum" (Borchers and Dhariwal, 2011).

Landry, Pardue, Reynolds, and Longnecker (2005) surveyed 18 four-year IS programs using the six IS core areas for the contemporary ABET accreditation and the ACM IS 2002 model curriculum as a framework to provide IS institutions with a basis for comparing their IS curricula both in terms of accreditation standards and the IS model curriculum. Kung, Yang, Zhang (2006) presented the core curricula of undergraduate IS programs based on accreditation criteria, comparing the results with a similar study in 1996 (Maier and Gambill, 1996).

Researchers have also been comparing and contrasting accreditation requirements. Reichgelt and Yaverbaum (2007) compared and contrasted the ABET accreditation with the Association to Advance Collegiate Schools of Business (AACSB) accreditation. In 2007, Hilton and Lo found that compliance with the ABET standards was evidently relatively high among most of the 112 IS programs they surveyed (Hilton and Lo, 2007).

2. SURVEY METHODOLOGY AND LIMITATIONS

The core undergraduate information systems curriculum for which ABET assessment data were collected was the primary focus of this study. This survey did not include general education, minor, or breadth courses, nor did it include college-level requirements, such as a business core. The authors conducted a survey during the summer of 2012, (April, May, and

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June, 2012, and freezing all data collection at the time of collection, as the websites were dynamic and changing.) The list of schools came from the ABET accredited 4-year IS programs website by searching for accredited IS programs at http://www.abet.org. A total of 457 core IS curriculum courses were analyzed from the 36 programs and categorized into 11 groups common across all programs. Histograms were created for each group category from the total number of courses offered by category type to show the frequency distribution by number of courses offered by program. Appendix A contains an alphabetized list of the school name, its location, the school's website URL, the program and degree name, the accreditation date and the date of the next comprehensive review. Appendix B contains the alphabetized list, the program and degree name, and the program's URL.

Limitations of Internet Curriculum Reviews

All surveys have limitations, and this one is no different. The researchers gathered the information during the summer of 2012 with the knowledge that programs change, and data and information published on public websites is often incomplete or outdated, and sometimes difficult to find. For example, during the course of the survey, two programs changed substantially, and may no longer be accredited. One program no longer exists, and one program changed to a different major and listed as an IT emphasis rather than IS. The information is only what was readily available on each program's website; more detailed information might be found in each school's catalog. Additionally, some of the information may be out of date at the time of this paper's publication; hence, it is recommended that readers visit the university and program's websites to verify information and ABET's information is often outdated due to review cycles.

3. FINDINGS

The findings show general information about the programs, such as how long the programs have been accredited and how many programs are accredited. The data also shows detailed curriculum information on the most common courses offered, how many in each course category offered, and obvious gaps in current curriculum, such as required courses on security.

How long has the program been accredited?

The first question answered is how long the program been accredited? As shown in Table 1, the majority of programs have been accredited less than 10 years, and less than one third have been accredited longer than 10 years.

Years Accredited	Programs
2–5 years (10 programs)	2, 3, 6, 8, 18, 19, 23, 24, 26, 34
6-9 years (15 programs)	1, 5, 7, 10, 11, 13, 17, 21, 22, 25, 27, 29, 32, 33, 36
10+ years (11 programs)	4, 9, 12, 14, 15, 16, 20, 28, 30, 31, 35

Table 1. Program Accreditation Length
* The numbers in the Programs column refer to the university number in Appendices A and B.

Additional ABET Accredited Programs

All but three of the schools have more than one program accredited by ABET. More than half (20) had 1-4 other programs accredited, while 11 schools had 5-9 additional accredited programs. Three schools had 10 or more accredited programs (results in Table 2).

Number of additional accredited programs	Programs
None (3 Programs)	6, 17, 24
1-4 (20 Programs)	1, 3, 4, 5, 9, 10, 11, 12, 13, 16, 18, 19, 20, 22, 23, 25, 26, 28, 29, 34
5-9 (10 Programs)	2, 7, 8, 21, 26, 30, 31, 32, 35, 36
10+ (3 Programs)	14, 15, 33

Table 2. Additional accredited programs
* The numbers in the Programs column refer to the university number in Appendices A and B.

Program Core Curriculum

This study reviewed all 36 (N = 36), ABET accredited undergraduate programs in IS. All required courses (N = 457), were analyzed and grouped by similarities by course topics. The core curriculum emerged as groupings of similar courses required by all programs, as shown in Table 3 and Figure 20. The most common number of credit hours required for the

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Information Systems degree is 48, (mean = 46.03, median = 46.5 and the mode = 48), with a minimum of 24 credit hours and a maximum of 76. The number of courses required to graduate also varied, but the most common was 11 required core IS courses, (mean = 14.11, median = 13.5 and the mode = 11), with a minimum of 8 and a maximum of 23.

The data presented patterns in the core courses required. Groups of similar classes started to form around the following course categories:

1) Introduction to Information Systems,
2) Programming and Computer Science,
3) Operating Systems,
4) Web Technologies and W3C Standards,
5) Databases,
6) Analysis and Design,
7) Networks and Mobile Computing,
8) Hardware,
9) Security,
10) Information Systems Project Management,
11) Internship, Capstone or Professional Development.

While not a statistical data mining approach, these categories reflected previous study groups and categories, and were thus retained to match the historical groupings as shown in Table 3. The data reported below are descriptive statistics. It does not argue what should be, or what such programs were in the past, or what they may evolve into in the future. It is a description of what is, at one point in time, June 2012, and may be useful as a way to compare and contrast programs against the typical core curriculum in the typical ABET accredited Information Systems program.

1) There is high variation in course descriptions for the Introduction to Information Systems class, as shown in Figure 1. The total number of all classes in this category across all 36 programs was 66, with 16 fitting directly into an introduction to information systems class (24%). Sixteen related to ethics or law and policy with respect to information (24%). Office productivity software comprised 23% of such classes. There were five lower-level Management of Information Systems (MIS) classes that did not fit the higher 300-level MIS classes which were included in this category.

Five IS programs did not require an Introduction to Information Systems class, seven required

one, 17 required two, three required three, and four required four. The descriptive statistics show a mean of 1.83 (SD=1.13), a median of 2, and a mode of 2. *Thus, the typical ABET accredited IS program requires two classes, Introduction to Information Systems and Ethics, in the category of Introduction to Information Systems, as shown in Figures 1 and 2.*
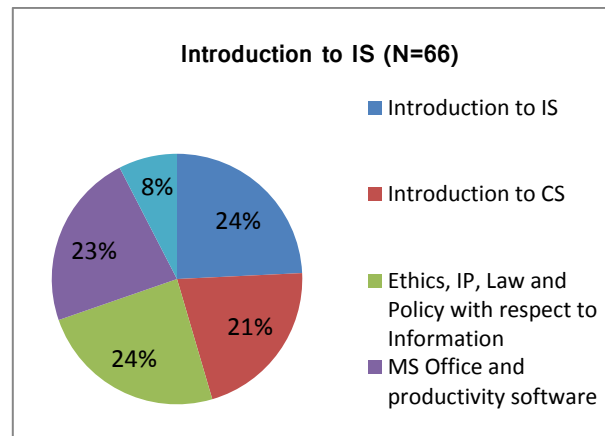

Figure 1. Pie Chart of Introduction to Information Systems
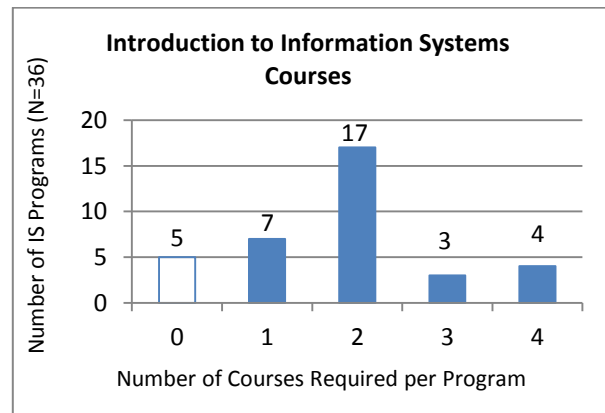

Figure 2. Histogram of Introduction to Information Systems Courses

2) The Programming and Computer Science category of courses had variation as well in both the number of classes required and the programming language offered, as shown in Figure 3. A total of 91 courses were offered. The most frequently offered programming class was a Programming 1 class in C, C++ or C#, (26%) in this programming category. A second course in the same language as the first Programming 1 class, offered in a Programming 2 class was required (16%). Many offered a pseudo-code, introduction or scripting in languages such as Java Script, Alice, or MIT Scratch environments,

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(17%). Other languages offered were Visual Basic (6 out of 91), .Net (1 out of 91) and Java (5 out of 91). Some programs required Object Oriented Programming, (OOP) and Data Structures in addition to other programming classes.

All IS programs required programming. Six programs required one, 16 required two, seven required three, five required four, and one required five and one required seven. The highest concentration of IS programs (16) require two courses. The mean is 2.53 (SD=1.26), median of 2 and mode of 2. *Thus, the typical ABET accredited IS program requires two programming courses, one as Programing 1 (C++) and the other as a Pseudo-coding class, as shown in Figures 3 and 4.*
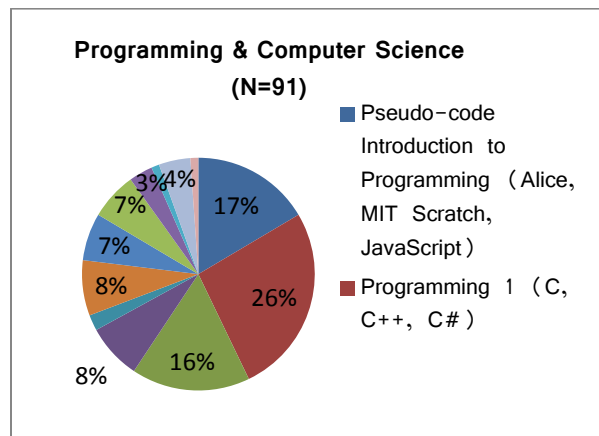

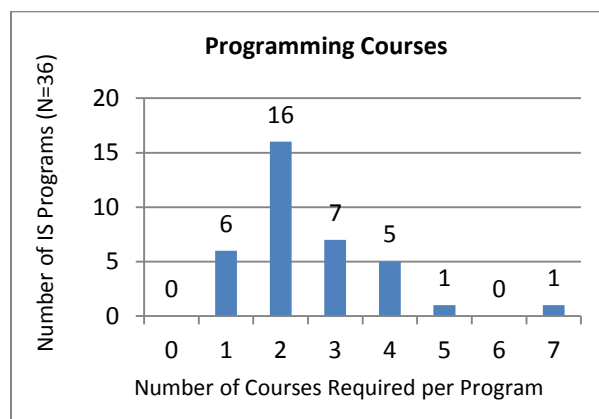Figure 3. Pie Chart of Programming & Computer Science

Figure 4. Histogram of Programming & Computer Science Courses

3) The Operating Systems Class was evaluated because of a historical precedence. In 1995, 30% of the ABET IS programs offered *at least*

one class, (see Table 4). In 2012, the mean was 0.30 (SD=0.52), median of 0 and mode of 0. Twenty six programs did not require an operating systems class, nine required one and one required two. *Thus, the typical IS program does not offer a class in operating systems, as is shown in Figure 5.*
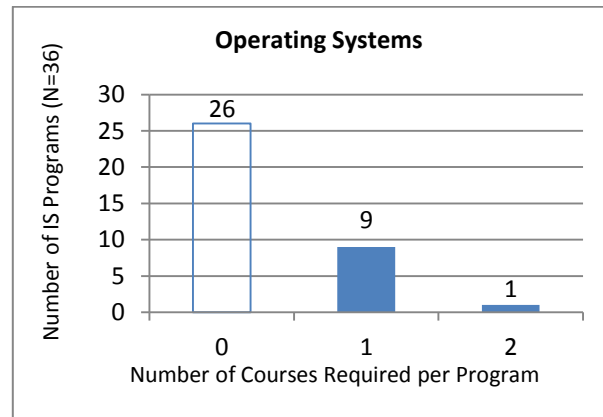

Figure 5. Histogram of Operating Systems Courses

4) There are 35 classes offered in the Web Technologies and W3C Standards category. Most of these were in a sub-category of a client-side Web development class, focusing on HTML, CSS, and JavaScript (51%). Several were Web client-server classes with CGI, PHP or more advanced JavaScript (29%). Only three classes were advanced Web services and four were e-commerce classes, as shown in Figure 6.
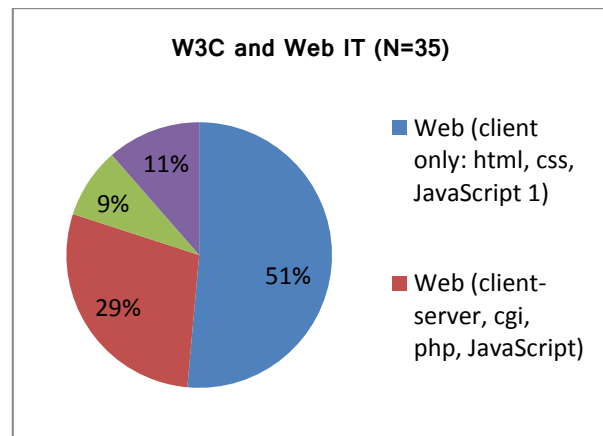

Figure 6. Pie Chart on W3C and Web IT

Thirteen programs did not require any Web technology classes, fifteen required one, and seven required two. One program required six. The highest concentration of IS programs (15) in this category required one Web technology

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class. The mean is 0.97 (SD=1.13), median 1, and mode 1. *Thus, the typical ABET accredited IS program requires one class in the category of Web Technologies and W3C Standards, as a Web client side and Java Scripting class, as shown in Figures 6 and 7.*
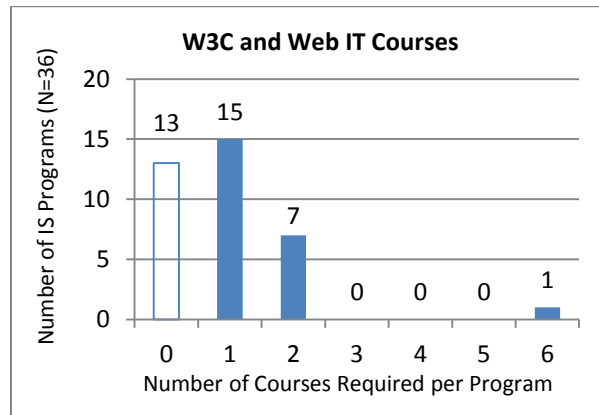

Figure 7. Histogram of W3C and Web IT Courses

5) The Database category of classes appeared uniform and homogeneous, as shown in Figure 8, with 47 database classes in total required across 36 programs. The most frequently offered database class was an entry level database class focused on entity-relationship diagrams and Structured Query Language (SQL). It was offered in 35 out of a total of 47 classes (75%). A more advanced database application development class was offered in 10 out of 47 classes, (21%) and it was often found combined with a Web client-server class. Even though business intelligence is of high value, only one program offered such a class.
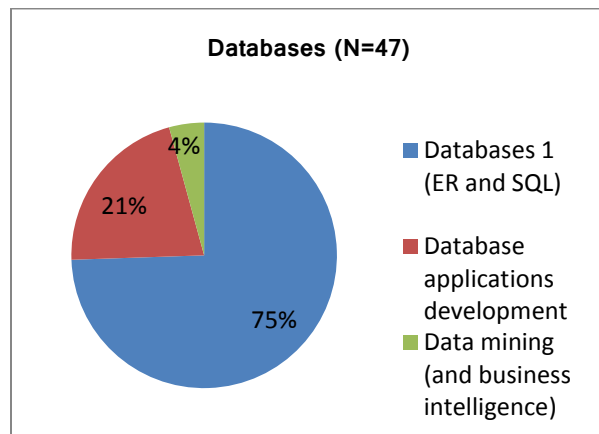

Figure 8. Pie Chart on Databases

There was only one IS program that did not require a database class. There were 24 IS programs that required one database class, and ten that required two. There was only one IS program that required three database classes. The highest concentration of IS programs, 24 out of 47, (75%) require one course. For all IS programs, the database category has a mean of 1.3 (SD=0.58), a median of 1, and a mode of 1. *Thus, the typical ABET accredited IS program requires one class in databases, one that focuses on* entity-relationship diagrams and Structured Query Language (SQL), *as shown in Figures 8 and 9.*
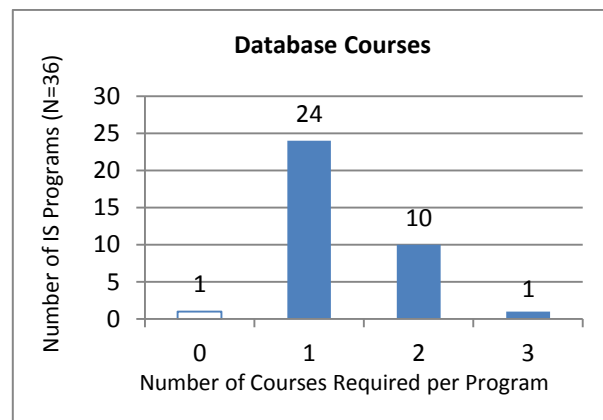

Figure 9. Histogram of Database Courses

6) Analysis and Design Courses comprised 92 courses offered across all 36 programs. This category included both Systems Analysis and Design 1 (35%) and Systems Analysis and Design 2 (18%), as shown in Figure 10. This category grouped all classes that dealt with design of information systems, so included here were the advanced MIS classes (26%), Human-computer Interaction classes (10%), Technical Writing classes (8%), and Business Process Management classes (3%).

There was only one IS program that did not require any Analysis and Design class, four IS programs required one class, 13 programs that required two, 11 programs that required three, and six programs that required four. The highest concentration of IS programs, 13, require two courses. For this entire category, the mean is 2.55 (SD=1.08), median 2, and mode 2. *Thus, most ABET accredited IS programs required two Analysis and Design Courses in their programs, both the Systems Analysis and Design 1 and MIS classes, as shown in Figures 10 and 11.*
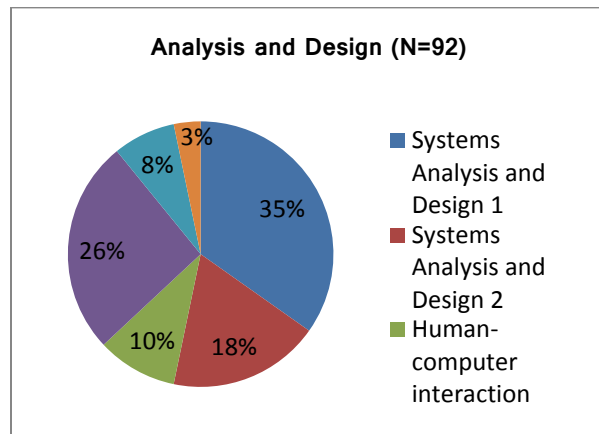
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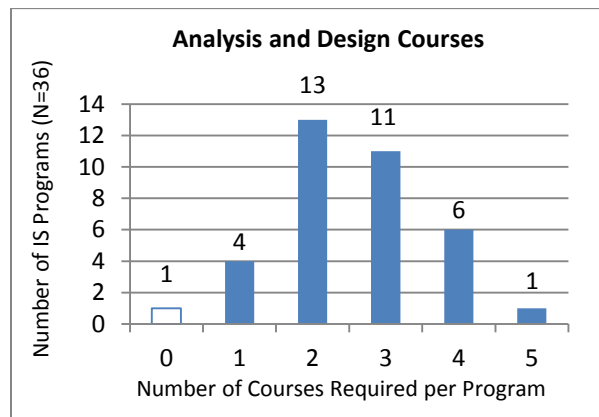**Figure 10. Pie Chart on Analysis and Design**

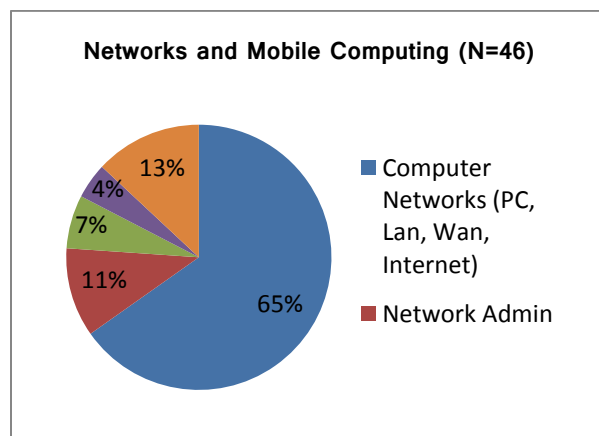**Figure 11. Histogram of Analysis and Design Courses**

Figure 12. Pie Chart of Networks and Mobile Computing

7) The Networks and Mobile Computing category was comprised of telecommunications, data communications, local and wide area networks as well as any mobile commuting courses. There were 46 courses across 36 programs, as shown in Figure 12. The most numerous is a Computer

Networks class (65%). There are other courses, such as Network Administration (11%), and Enterprise Resources and Management (13%). There were no courses dedicated to Cloud Computing.

There were four programs that did not require any networking class, 25 that required one class, three programs that required two classes, one program that required three, and three programs that required four. For this category, the mean is 1.28 (SD=1.0), median of 1 and mode of 1. *Thus, programs require one Networks and Mobile Computing class, as shown in Figure 13.*
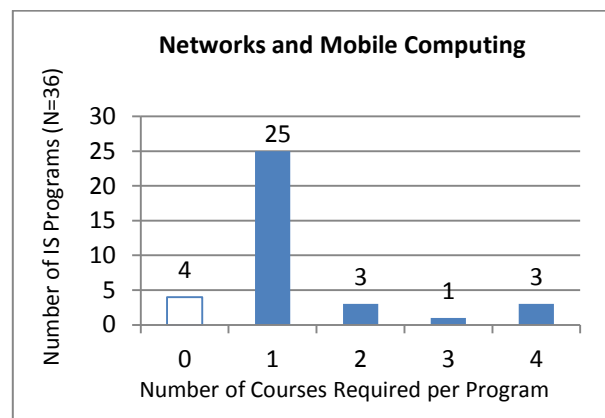

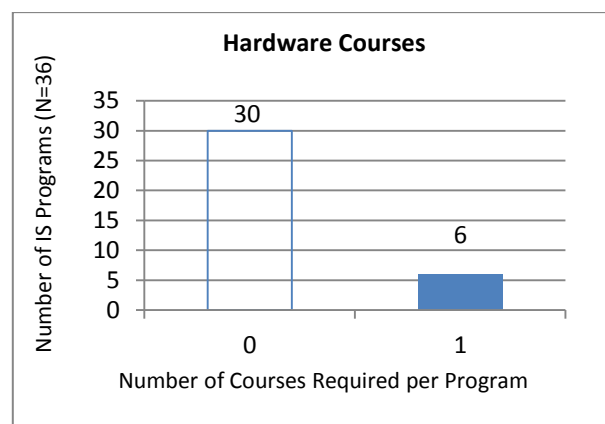**Figure 13. Histogram of Networks and Mobile Computing Courses**

Figure 14. Histogram of Hardware Courses

8) Courses offered in the hardware category showed 6 classes out of 36 programs. Thirty programs did not require a course on hardware, six required one. The mean was 0.17 (SD=0.38), and the median was 0, as was the

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mode 0. *Thus, most programs did not offer courses in hardware, as shown in Figure 14.*

9) The security category showed a total of 7 courses required out of 457 offered across all 36 IS programs, with six courses offered in System Security, (PCs, Databases, and Networks) and only one offered in Enterprise Security.

Thirty of the 36 programs did not require a course on security. Five programs required one, and one program required two. The mean is equal to 0.19 (SD=0.47), median equal to 0 and mode equal to 0. *Thus, most ABET accredited IS programs do not require any courses on security, as shown in Figure 15.*
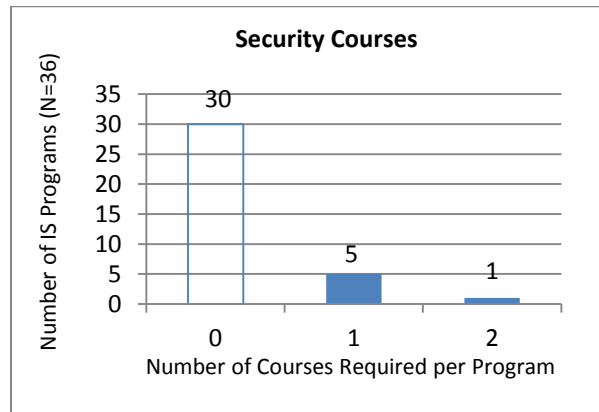

Figure 15. Histogram of Security Courses
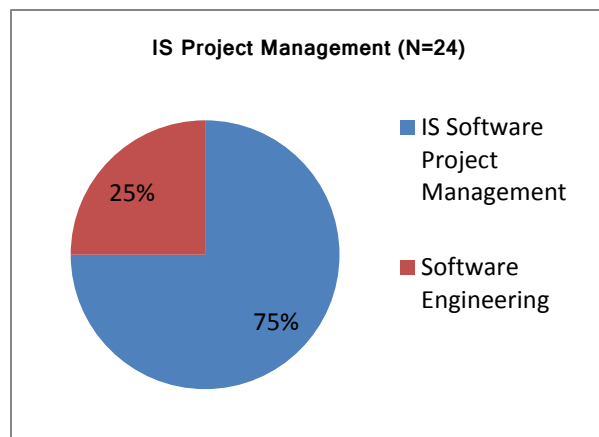
Figure 16. Pie Chart of IS Project Management

10) IS Project Management as a category showed 24 courses required across 36 programs. The most frequently offered course was an IS Software Project Management class (75%). The next most frequently offered was a

Software Engineering class (25%), as shown in Figure 16.

Of the 36 programs, 15 did not require a Project Management class, 18 required one and three required two. The mean was 0.67 (SD=0.63), median of 1, and mode of 1. *Thus, most IS programs required one IS Project Management course as shown in Figure 17.*
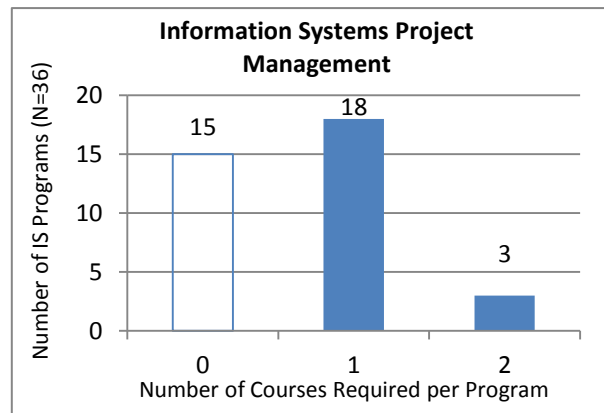
Figure 17. Histogram of Information Systems Project Management Courses
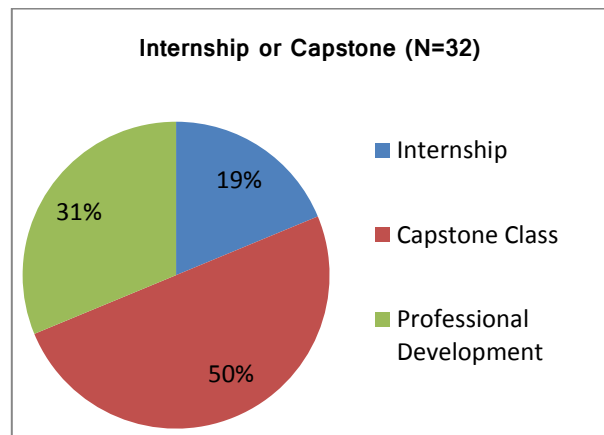
Figure 18. Pie Chart of Internship or Capstone

11) Internship, Capstone or Professional Development as a category showed 32 such experiences across the 36 programs. Internships were required less often than (19%), Capstone Classes which were required in half of the programs (50%), and often in first and second term combinations. A Professional Development class was required by almost a third of the programs (31%) to fulfill the requirements of the IS degree, as shown in Figure 18.

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Thirteen programs did not require such an experience, 15 required one, seven required two and one required three. The mean was 0.89 (SD=0.82) and a median of 1, and a mode of 1. *Thus, most programs required one such experience from this category, as shown in Figure 19*.

Internship, Capstone or Professional Development
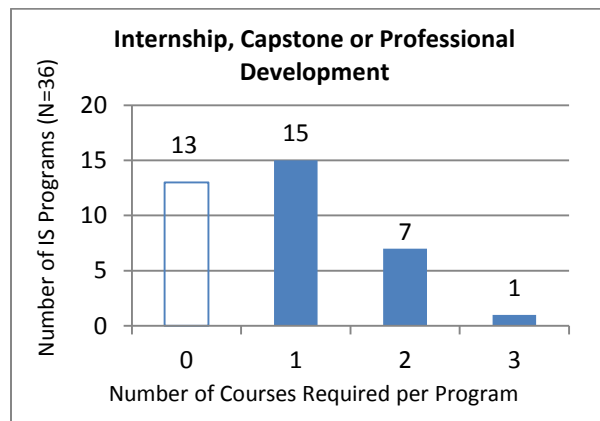
Figure 19. Histogram of Internship, Capstone or Professional Development.

Tracks, concentrations, or specializations

Several programs had their coursework grouped into tracks or concentrations to enable the students to easily arrange their coursework to meet their academic or career goals. Taking the coursework as grouped in the track was not a requirement – most programs allowed students to determine which elective courses to take. All programs had elective requirements for their students, where the electives could be selected from the major's departments other courses.

4. DISCUSSION AND CONCLUSION

The intent of this survey was to enable the authors to compare and contrast their current accredited IS program with other IS programs accredited by ABET. We found several similarities and differences among the accredited programs, including:

• The majority of 36 IS programs have been accredited for over 6 years.
• Most programs are part of a larger group of ABET accredited programs within the school.
• There was a wide variety in which type of core courses were required.

While there are similarities and differences, these might to be indicative of the culture and historical course offerings of the department or the expertise of the faculty, and provide a variety of programs from which students can choose.

Typical Core Curriculum

The statistical analysis shows a central tendency useful to better understand a typical core curriculum in 2012.

Typical Core Curriculum found across all ABET Information Systems Programs June 2012		
Course Category	**Count**	**Mode**
1. Analysis and Design	92	2
2. Programming & Computer Science	91	2
3. Introduction to Information Systems (Ethics, Law, Policy)	66	2
4. Databases	47	1
5. Networks and Mobile	46	1
6. W3C and Web IT	35	1
7. Internship or Capstone	32	1
8. IS Project Management	24	1
9. Operating Systems	11	0
10. Security	7	0
11. HW	6	0
Total	**457**	**11**

Table 3. Typical Core Curriculum found across all ABET Information Systems Programs June 2012, (N=36)

The data analysis revealed a typical core curriculum, as shown in Table 3, which consists of the following 11 category courses, ranked by frequency in descending order by raw count, and 8 core category courses if considering the mode for each. The mode indicates the number of such courses in that category which are offered by a typical program.

Thus, the typical core curriculum of the ABET accredited IS undergraduate program in June 2012 consists of two analysis and design classes, (Analysis and Design and MIS), two programming classes, (Programming 1 in C++, and either Programming 2 in C++ or a pseudo programming class), two introduction to information systems classes, (Ethics and

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Introduction to Information Systems), and one of each: a database class, a networks class, a web technologies class, an IS project management class, and a capstone class.

Two sub-categories in Analysis and Design deserve special discussion, as both could be separated into categories of their own. The high-level MIS class (300 level), focuses on the enterprise needs of and management of information systems. A broad survey class covering many topics and none in depth: enterprise resource management, customer relationship management, business intelligence, E-commerce, and many more. Its function is to increase the students understanding of the internal and external dynamics and the duel constraints of changing technology infrastructure as well as external economic and market forces. A main focus is on information systems as they impact and support the entire value chain and the corresponding business processes. Business process management classes are core to MIS and involve translation of the value chain into business unit activities which form the core foundation to start the system design process.

Figure 20. Pie Chart of a Core Curriculum found in ABET Information Systems Programs

The Human-computer Interaction (HCI) classes are focused on design and interaction of the end user and the information system, and how to make that interaction successful and profitable. HCI is applied human factors, interaction design,

user interface design, and when combined with goals and objectives of business needs and market demand, becomes a critical topic in analysis and design on user experience (UX). When UX is focused on the interaction design of systems for competitive advantage and improved return on investment, better information systems are designed and built. Such coupled design dimensions result in information systems designed and built for increased business process efficiency, improved employee productivity, lower training costs, reduced error rates, and more secure systems.

One of the most interesting observations was the absence of a required security course in the ABET IS core curriculum. Only 7 of the 457 required IS courses surveyed, were dedicated to the topic of security. Security as a category ranked 10 out of 11 in the frequency of required core courses offered across all 36 IS programs. Security as a category has a mode of 0, which indicates that typical ABET IS programs do not require security courses to graduate with an undergraduate degree in IS.

The most immediate implication is to consider the nation's cyber-crime and cyber-terrorism threat in this light. If students are graduating from ABET accredited programs in IS without adequate education in security, it may be a weakness or even a threat to businesses, organizations, and government systems of the nation. However, it is difficult to teach a class in IS without covering topics in security. It is possible that the core curriculum offer sufficient coverage of the security topics embedded within each class. This is an area for future research and study, as this study did not consider each class syllabi in detail.

Other low frequency classes, such as hardware and operating systems do have implications for security. Programs which required such classes could be a reflection of the IS programs housed in computer science departments, not business departments, and an argument to remove them as irrelevant could be hastily surmised. We caution from such a quick conclusion, and ask; is there a need to offer such material within the context of a mandatory, comprehensive, security class? In a market that is moving towards outsourced computing, software-as-a-service, and Cloud computing, many may consider such topics too removed from the core IS program to be relevant, however, we caution from such a conclusion. If the hardware is not secure,
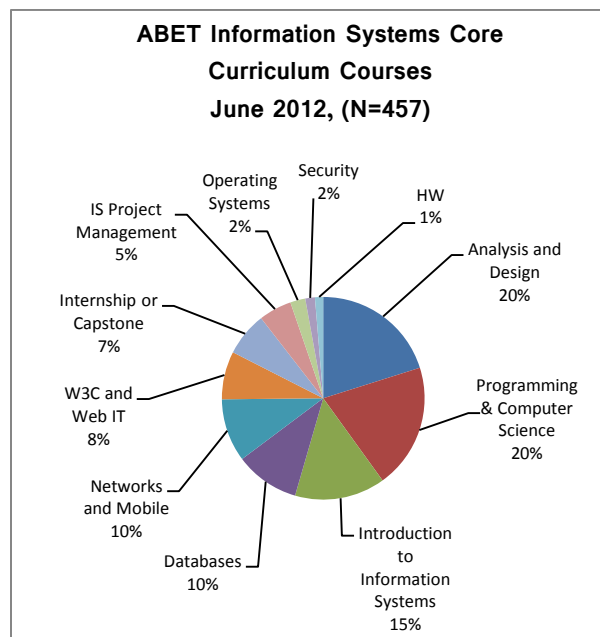
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neither is the OS, software or the data. If the OS is not secure, neither is the software or the data, or even the hardware. They are interrelated and interlinked and are required before issues of people, policy, and process, typical topics in IS security, can be addressed.

Reviewing the historical trend since 1995, as shown in Table 4, shows an increased number of ABET IS programs overall, and in raw percentages consolidation around a core curriculum of courses. This is indicative of an emergent convergence and consensus around a core IS curriculum. This has occurred without a required, or published ABET IS curriculum in 2012, and represents an interesting and dynamic positive function of an open and flexible ABET accreditation process; one that allows individual departments to customize offerings to fit the needs of their students, future student employers, academic institutions, and research goals and objectives.

One course, in each category, of the IS courses by raw percentage of programs			
	%		
Course category	1995	2005	2012 (N=36)
Programming and Computer Science (at least one class)	72%	60%	(36/36) 100%
Analysis and Design	61%	94%	(35/36) 97%
Introduction to Information Systems	40%	61%	(31/36) 86%
Databases	91%	92%	(35/36) 97%
Networks, Mobile* and Telecommunications	81%	71%	(32/36) 89%
Internship or Capstone	30%	47%	(23/36) 64%
W3C and Web IT	N/A	N/A	(23/36) 63%
IS Project Management	N/A	N/A	(21/36) 58%
Operating Systems	30%	16%	(10/36) 28%
Note: the 1995 and 2005 data were taken from Maier and Gambill (1996) and Kung et al (2006) respectively. *Mobile was N/A in 1995 and 2005			

Table 4. Historical Table, raw percentages.

One recommendation is for ABET to keep and maintain an official, secure database on core curriculums, and to make such data transparent, open, and accessible to the community for improved communication, collaboration and decision support. A second recommendation is for ABET to implement a secured, private Wiki, to support this emergent phenomenon of a bottom up and dynamic curriculum development and modification and convergence among ABET IS members and to support richer and more meaningful, sharing, debate, and adoption of ideas. ABET can play a pivotal role in data collection, dissemination and support through encouragement of this trend towards self-improvement, collaboration, and empowerment.

5. FUTURE RESEARCH

Future research plans include comparing and contrasting all ABET-accredited programs in the world, comparing non-accredited programs to ABET-accredited programs, how the core curriculum of ABET-accredited programs compare with the ACM model curriculum and others, and applying data mining techniques to detailed course material and exploring similarities and differences. The other trajectory is in building and sharing information and information systems frameworks for increased collaboration and improving undergraduate IS education in all programs and for all students, with respect to the student's goal of intellectual enlightenment.

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7. Appendices

Appendix A: ALPHABETICAL List of Universities and IS programs in the US

School Name	Location	Website	Program and Degree Name	Accreditation Dates	Date of Next Comprehensive Review
1. Arkansas Tech University	Russellville, AR, US	www.atu.edu	Information Systems, BS	10/01/2006-Present	2013-2014
2. California State University, Chico	Chico, CA, US	www.csuchico.edu	Computer Information Systems, BS	10/01/2008-Present	2015-2016
3. California University of Pennsylvania	California, PA, US	www.calu.edu	Computer Information Systems, BS	10/01/2008-Present	2011-2012
4. Drexel University, College of Information Science & Technology	Philadelphia, PA, US	www.drexel.edu	Information Systems, BS	10/01/2001-Present	2014-2015
5. Fitchburg State College	Fitchburg, MA, US	www.fsc.edu	Computer Information Systems, BS	10/01/2006-Present	2013-2014
6. Florida Memorial University	Miami Gardens, FL, US	www.fmuniv.edu	Computer Information Systems, BS	10/01/2008-Present	2015-2016
7. Gannon University	Erie, PA, US	www.gannon.edu	Management Information Systems, BS	10/01/2004-Present	2011-2012
8. Grand Valley State University	Allendale, MI, US	www.gvsu.edu	Information Systems, BA (BS no longer exists)	10/01/2007-Present	2014-2015

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School Name	Location	Website	Program and Degree Name	Accreditation Dates	Date of Next Comprehensive Review
9. Illinois State University	Normal, IL, US	www.ilstu.edu	Information Systems, BS	10/01/2001-Present	2014-2015
10. Jacksonville State University	Jacksonville, AL, US	www.jsu.edu	Computer Information Systems, BS	10/01/2003-Present	2016-2017
11. James Madison University	Harrisonburg, VA, US	www.jmu.edu	Computer Information Systems, BBA	10/01/2003-Present	2016-2017
12. Kennesaw State University	Kennesaw, GA, US	www.kennesaw.edu	Information Systems, BS	10/01/2002-Present	2015-2016
13. Metropolitan State College of Denver	Denver, CO, US	www.mscd.edu/	Computer Information Systems, BS	10/01/2005-Present	2015-2016
14. New Jersey Institute of Technology	Newark, NJ, US	www.njit.edu	Information Systems, BA	10/01/2002-Present	2013-2014
15. New Jersey Institute of Technology	Newark, NJ, US	www.njit.edu	Information Systems, BS	10/01/2002-Present	2013-2014
16. Pace University	New York, NY, US	www.pace.edu	Information Systems, BS	10/01/2000-Present	2012-2013
17. Quinnipiac University	Hamden, CT, US	www.quinnipiac.edu	Computer Information Systems, BS	10/01/2005-Present	2012-2013
18. Radford University	Radford, VA, US	www.radford.edu	Information Science and Systems - Information Systems Concentration, B.S.	10/01/2008-Present	2015-2016

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School Name	Location	Website	Program and Degree Name	Accreditation Dates	Date of Next Comprehensive Review
19. Regis University	Denver, CO, US	www.regis.edu	Computer Information Systems, BS	10/01/2010-Present	2016-2017
20. Robert Morris University	Moon Township, PA, US	www.rmu.edu	Computer Information Systems, BS	10/01/2001-Present	2015-2016
21. Rowan University	Glassboro, NJ, US	www.rowan.edu	Management Information Systems, BS	10/01/2006-Present	2012-2013
22. Slippery Rock University	Slippery Rock, PA, US	www.sru.edu	Information Systems, B.S.	10/01/2003-Present	2016-2017
23. Southern Utah University	Cedar City, UT, US	www.suu.edu	Information Systems, BS	10/01/2009-Present	2013-2014
24. The University of Tampa	Tampa, FL, US	www.ut.edu	Management Information Systems, BS	10/01/2009-Present	2016-2017
25. University of Arkansas at Little Rock	Little Rock, AR, US	www.ualr.edu	Information Science, BS	10/01/2006-Present	2013-2014
26. University of Houston, College of Technology	Houston, TX, US	www.tech.uh.edu	Computer Information Systems, BS	10/01/2009-Present	2014-2015
27. University of Houston-Clear Lake	Houston, TX, US	www.uhcl.edu	Computer Information Systems, BS	10/01/2004-Present	2013-2014

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School Name	Location	Website	Program and Degree Name	Accreditation Dates	Date of Next Comprehensive Review
28. University of Nebraska at Omaha	Omaha, NE, US	www.ist.unomaha.edu	Management Information Systems, BS	10/01/2002-Present	2015-2016
29. University of North Alabama	Florence, AL, US	www.una.edu	Computer Information Systems, BBA	10/01/2006-Present	2013-2014
30. University of North Florida	Jacksonville, FL, US	www.unf.edu	Computing and Information Sciences: Information Systems, BS	10/01/2001-Present	2013-2014
31. University of South Alabama	Mobile, AL, US	www.usouthal.edu	Information Systems, BS	10/01/2001-Present	2014-2015
32. University of South Carolina	Columbia, SC, US	www.sc.edu	Computer Information Systems, BS	10/01/2004-Present	2011-2012
33. Utah State University	Logan, UT, US	www.usu.edu	Computer Science - Information Systems Option, BS	10/01/2005-Present	2014-2015
34. Utah Valley University	Orem, UT, US	www.uvu.edu	Information Systems, BS	10/01/2007-Present	2014-2015
35. Virginia Commonwealth University	Richmond, VA, US	www.vcu.edu	Information Systems, BS	10/01/2001-Present	2014-2015
36. Wright State University	Dayton, OH, US	www.wright.edu	Management Information Systems, BSB	10/01/2004-Present	2011-2012

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Appendix B. Alphabetical List of Universities, IS Program and Degree, and Website URL

1. Arkansas Tech University. Information Systems, BS.
http://www.atu.edu/academics/catalog/colleges/applied_sciences/dept_comp_info_sci.html.

2. California State University. Computer Information Systems, BS.
http://csci.ecst.csuchico.edu/programs/bs-cins.

3. California University of Pennsylvania. Computer Information Systems, BS.
http://www.calu.edu/academics/programs/computer-information-systems/index.htm.

4. Drexel University. Information Systems, BS.
http://www.ischool.drexel.edu/PS/UndergraduatePrograms/AcademicPrograms/BSIS/.

5. Fitchburg State College. Computer Information Systems, BS.
http://www.fitchburgstate.edu/academics/undergraduate-day-programs/computer-information-systems/.

6. Florida Memorial University. Computer Information Systems, BS.
http://www.fmuniv.edu/home/academics/school-of-arts-and-sciences/computer-science-mathematics-and-technology/bachelor-of-science-in-computer-information-systems/.

7. Gannon University. Management Information Systems. http://www.gannon.edu/Academic-Offerings/Engineering-and-Business/Undergraduate/Information-Systems/.

8. Grand Valley State University. Information Systems, BA (BS no longer exists).
http://www.cis.gvsu.edu/degrees/inf.

9. Illinois State University. Information Systems, BS.
http://it.illinoisstate.edu/undergraduate/majors/information-systems/.

10. Jacksonville State University. Computer Information Systems, BS.
http://www.jsu.edu/mcis/index.html.

11. James Madison University. Computer Information Systems, BBA.
http://www.jmu.edu/cob/cis/cismajors.shtml.

12. Kennesaw State University. Information Systems, BS.
http://coles.kennesaw.edu/undergraduate/programs/information-systems.htm.

13. Metropolitan State College of Denver. Computer Information Systems, BS.
http://www.mscd.edu/cis/.

14. New Jersey Institute of Technology. Information Systems, BA.
http://is.njit.edu/academics/undergraduate/bais/index.php.

15. New Jersey Institute of Technology. Information Systems, BS.
http://is.njit.edu/academics/undergraduate/bsis/index.php.

16. Pace University. Information Systems, BS. http://appsrv.pace.edu/academics/view-programs/?School=SCS&Cred=BS&Maj=ISC&Location=nyc&details.

17. Quinnipiac University. Computer Information Systems, BS.
http://www.quinnipiac.edu/academics/colleges-schools-and-departments/school-of-business/departments/department-of-computer-information-systems/bs-in-computer-information-systems.

18. Radford University. Information Science and Systems - Information Systems Concentration, B.S.
http://www.radford.edu/content/csat/home/itec/programs/information-science/information-systems.html.

19. Regis University. Computer Information Systems, BS. http://cps.regis.edu/degrees-bachelors-computer-systems.php.

20. Robert Morris University. Computer Information Systems, BS.
http://www.rmu.edu/web/cms/schools/scis/cis/Pages/bs-computer-info-systems.aspx.

21. Rowan University. Management Information Systems, BS.
http://www.rowan.edu/colleges/business/programs/bs_mis/index.cfm.

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22. Slippery Rock University. Information Systems, B.S.
http://catalog.sru.edu/preview_program.php?catoid=20&poid=3127&returnto=408.

23. Southern Utah University. Information Systems, BS.
http://www.suu.edu/prostu/majors/ciet/informationsystems.html.

24. The University of Tampa. Management Information Systems, BS.
http://www.ut.edu/businessdegrees/itm/mis/.

25. University of Arkansas at Little Rock. Information Science, BS.
http://ualr.edu/informationscience/.

26. University of Houston. Computer Information Systems, BS.
http://www.tech.uh.edu/programs/undergraduate/computer-information-systems/degree-requirements/.

27. University of Houston-Clear Lake. Computer Information Systems, BS.
http://prtl.uhcl.edu/portal/page/portal/SCE/COMPUTING_MATHMATICS_DIV/cis/CIS_BS/BS_requirements.

28. University of Nebraska at Omaha. Management Information Systems, BS.
http://www.ist.unomaha.edu/?p=und/mis.

29. University of North Alabama. Computer Information Systems, BBA.
http://business.una.edu/cis.php.

30. University of North Florida. Computing and Information Sciences, Information Science, BS.
http://www.unf.edu/catalog/link/CCEC-BSCCISCIS2/.

31. University of South Alabama. Information Systems, BS.
http://www.southalabama.edu/bulletin/cis.htm#isc.

32. University of South Carolina. Computer Information Systems, BS.
http://www.cse.sc.edu/undergraduate/cis.

33. Utah State University. Computer Science - Information Systems Option, BS.
http://catalog.usu.edu/preview_program.php?catoid=3&poid=1067&returnto=244.

34. Utah Valley University. Information Systems, BS. http://www.uvu.edu/ist/.

35. Virginia Commonwealth University. Information Systems, BS.
http://www.business.vcu.edu/infosys.html.

36. Wright State University. Management Information Systems, BSB.
http://www.wright.edu/programs/management-information-systems.

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