

## ABET-CAC IS ACCREDITATION: CURRICULAR STANDARDS AND PROGRAM RANKINGS

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### ABSTRACT

*In the past four years, the total number of Information Systems (IS) programs attaining ABET-CAC accreditation has grown to 15. As the number of IS programs seeking accreditation is likely to increase, there is a need to assess not only the gains associated with the accreditation process but also potential unplanned negatives. This paper frames the recent ABET accreditation model with respect to the balance between business and stand-alone IS programs. The data analyzed for this paper was restricted to the curriculum of the current 15 ABET-CAC accredited schools and the curriculum of the top 19 MIS programs as identified by a popular and frequently cited ranking system [1].*

**Keywords:** ABET-CAC, MIS Programs, Accreditation, Information Systems

### INTRODUCTION

Five years after the first accreditation of an Information Systems program, there are 15 Information Systems programs accredited by the Accreditation Board for Engineering and Technology-Computing Accreditation Commission (ABET-CAC) [1]. Early discussions on accreditation focused on standards, consistency, defining the discipline, and quality. The first formal attempt at this focus publicly culminated with the IS95 Model Curriculum. This curriculum not only included a rationale for an IS program with suggested courses, but also extensive mapping of course objectives,

learning points, and learning outcomes [11]. The impact was significant and immediate. Now 11 years after that curriculum had been distributed and revised two times, it has become the foundation of the ABET-CAC accreditation that took form in 2002. However, with such a solid and welcomed acceptance, this curricular model evolved into the underlying foundation of accreditation standards. This paper initially presents a brief literature review that focuses on ABET-CAC curricular issues related to Information Systems programs. Then, a model of an information system is used to frame the ABET-CAC program standards as juxtaposed to non-ABET program standards. A detailed overview of the common curricular components of the ABET-CAC is presented in the context of the top 19 rated MIS programs. Finally, innovation will be introduced as something that evolves and dominates outside of accreditation standards.

### BACKGROUND AND CONTEXT

An analysis was performed of previous research by examining ABET IS accreditation in areas such as the value in receiving accreditation, the value in positioning the program in the school of business, and its relationship to AACSB accreditation. The review included an analysis of the prior work on ABET IS accreditation by Gorgone, Hilton, Jones, Lidtke, and MacKinnon. A synopsis of their findings is presented in Table 1 to support the position taken in this paper.

**Table 1.** Selected ABET-CAC Research Since 2001

Researchers	Findings
Gorgone, J. et al.	2002 revision of the IS 97 model curriculum [3].
Lidke, D.K. and Yaverbaum, G.J.	Information Systems Programs, while still in Business Schools, are found in increasing numbers in departments outside of business [10].
Hilton, T.S.E.	Most accredited IS programs are BS degrees, not bound by AACSB [3].
Kohun, F.G., & Wood, D. F.	Accredited IS programs are not usually located in a College of Business [7].
MacKinnon, R. J., & Butler, E. S.	Accredited IS programs have replaced some typical business credits with additional IS credits, thus producing a stronger technically oriented IS programs [12].
Hilton, T.S.E.,	Until recently, AACSB programs did not list information systems as a required content area.

Researchers	Findings
Johnson, D. A., & Kasper, G. M.	Information systems as a content area was absent from early AACSB accreditation standards, but changes in 2003 approved a standard where curriculum includes information technologies as they influence the structure and processes of organizations and economies and the role and techniques of management [5].
Jones, C. G	There is a significant difference in required information systems coursework between IS programs housed in AACSB-accredited business schools and those housed in information system schools [6].
Kohun, F.G., & Wood, D. F.	The first IS programs evaluated by ABET were evaluated by computer science professionals accustomed to evaluating technically strong computer science programs. Therefore, historically, a technically strong IS program would have a better chance of being accredited [8].

As noted by Hilton [4], MIS programs in a business school provide “business graduates with [adequate] education in a major change lever” and “to ensure that a large number of technology professionals are adequately educated in basic business concepts.” ABET accreditation of an MIS department housed within a college of business would only increase the credibility and quality of both the department and the college. However, ABET IS accreditation presents curriculum challenges on the balance of business and IS courses for those programs seeking AACSB accreditation, as noted by Jones [6].

**ABET PROGRAM CURRICULUM AND NON-ABET PROGRAM CURRICULUM**

Ranking of any programs labeled as IS have been unavailable since 1995. However, ComputerWorld’s ranking of IS programs in 1995 included largely MIS programs. Therefore, we chose the US News and World Report’s list of the top 19 MIS programs in 2006 (see Table 2) and compared their programs to the IS2002 model curriculum courses [13].

For many years, one of the most fundamental models to describe an information system has been the “Five Component Framework”, described by David Kroenke: “Hardware, Software, Data, Procedures, and People” [9]. We investigated where in the curriculum these components are treated.

We would like to argue that the ABET model focuses on Hardware, Software, and Data, with a lesser degree of attention to people and procedures. While business courses are a required part of the ABET accreditation, since IS courses are not permitted to be counted as an IS Environment, there are no explicit requirements for IS related business courses in the information system environment. We itemized the required and elective courses from the 19 top MIS

program rankings and categorized them by IS2002 required courses to which they correspond. They are presented in the Table 3.

**Table 2.** Top 19 MIS Programs from U.S. News and World Report 2006

Rank	University / College
1	Massachusetts Inst of Technology
2	Carnegie Mellon University
3	University of Texas–Austin
4	University of Arizona (Eller)
5	Univ of Minnesota–Twin Cities
6	Univ of Maryland–College Park
7A	University of Michigan–Ann Arbor
7B	University of Pennsylvania
9	New York University
10	Georgia State University
11	University of California–Berkeley
12	Indiana University–Bloomington
13	Bentley College
14	Purdue Univ –West Lafayette
15	Arizona State University
16A	University of Georgia
16B	University of Oklahoma
16C	University of Virginia
19	University of Washington

**Table 3.** IS2002 Courses in top 19 MIS Programs

IS2002 Course Title	No of Universities
Analysis and Logical Design	15
Electronic Business Strategy, Architecture, and Design	15
Fundamentals of Info Systems	6
Global and Ethical Issues	4
Information Systems Theory and Practice	2
Information Technology Hardware and Software	2
Networks and Telecom	11
Physical Design and Implementation in Emerging Environments	14
Physical Design and Implementation with DBMS	16
Programming, Data, File and Object Structures	15
Project Management and Practice	8

It can be seen from Table 3 that none of the top 19 programs include all of the IS2002 courses. This is made more noticeable when noting that this table includes not only required courses but also possible electives. Only 5 of the 10 courses are included by over 70% of the top 19 programs. The five courses include Analysis and Logical Design, Electronic Business Strategy, Architecture, and Design, Physical Design in Emerging Environments, Physical Design and Implementation with DBMS, and Programming, Data, File, and Object Structures. Many universities required programming courses to be taken outside the MIS department in a Computer Science department. It seems that MIS programs emphasize the Systems Development Life Cycle with few electives in other areas. A significant discovery was how few institutions even offered courses in Information Technology Hardware and Software, and Information Systems Theory and Practice.

We categorized the IS2002 curriculum, labeling eBusiness Strategy, Analysis and Design, and Project Management as People and Procedure related courses. Based on our categorization, we found the top 19 MIS programs to emphasize Procedures and People and Data in their courses and a lesser degree of attention on hardware and software. This is consistent with the findings of Jones [6]:

“... an AACSB IS program will include 17.2 hours of additional business course work. This business depth comes at the expense of information systems coursework depth. IS

departments in AACSB schools will likely face a tradeoff of information systems coursework for business classes...”

However, these programs included many more courses. The extra courses covered a broad range of topics, including many innovative ones. Table 4 shows those universities listed in Table 2 where courses did not map to any IS2002 model curriculum course.

**Table 4.** Top 19 MIS Program Courses not Included in IS2002 Curriculum

Course Title	University
Advanced Net-Centric Computing	13
Business Intelligence	16A
Collaboration Computing	4
Complex Technological Systems: Past, Present, and Future	2
Data Mining	3
Data Warehousing	5
Directed Reading in MIS	16B
Economics and Psychology or Organizational Communication	2
Economics of Entrepreneurship in High Tech Industries	2
Economics of Technological Change	2
Expert Systems / Artificial Intelligence	16B
Group Support Systems	16B
Independent Study	12
Individual Perspectives on Information Systems	19
Information Needs, Searching, and Presentation	19
Information Systems Applications	2
Information Systems Industry Internship	5
Information Systems Security	12
Information Systems Special Topics	5
Information Technology and Business Systems Consulting	7A
Intelligent Systems	10
Internship	3
Introduction to Artificial Intelligence	4
Introduction to Security and Privacy	10
Knowledge Management: Techniques and Practices	4
Modeling and Data Mining with Spreadsheets	9

Course Title	University
Organizational Communication	2
Organizational Intelligence	2
Research methods in Informatics	19
Research Project in CIS	7A
Rise of Industrial Research and Development	2
Science, Technology and Business in US History	2
Selected Topics in Information Systems	16C
Seminar in Decision Systems	7B
Software Agents and Multi-Agent Systems	4
Special Topics in MIS	4
Special Topics in MIS	16A
Streaming Media	9
Systems Modeling and Simulation	4
The Software Business	1
Topics in MIS	16B

Course Title	University
Electronic Commerce	9
Electronic Commerce	5
Electronic Commerce	16C
Electronic Commerce	16B
Electronic Commerce Strategy	15
Enterprise Resource Planning	12
Financial Information Systems	9
Financial Information Systems and Technologies	5
Financial Systems Engineering	16C
Fundamentals of Digital Business Strategy	1
Info Systems Infrastructure	16B
Information System Strategies for E-commerce	4
Information Technology in Business and Society	9
Integrated Enterprise Wide Systems	16A
Internet Business and Technology	4
Introduction to Enterprise Computing Environments	4
IT Essentials II -- Advanced Technologies for Digital Business in the Knowledge Economy	1
Managerial Decision Making	2
Service Operations Management	7B
Strategic IT management	3
The Supply Chain and Logistics	4
<b>Analysis and Logical Design</b>	
Analysis and Modeling for Business Systems Development	5
Application Design and Development	2
Business Application Development	12
Business Data Analysis	16B
Business Syst. Analysis & Design	13
Enterprise Process Analysis and Design	15
Human Interface to Information Technology	7A
Information System Design	19
Information Systems Analysis and Design	4
Object-Oriented Analysis & Design	14
Systems Analysis	10
Systems Analysis & Design	6
Systems Analysis & Design	9
Systems Analysis & Design	16A
Systems Analysis & Design	12

**ACCREDITATION AND CHANGE**

The courses of IS2002, which embodied people and procedures to the largest extent, were that of Electronic Business Strategy, Architecture, and Design, and Analysis and Logical Design. Table 5 shows those universities listed in Table 2 where the top 19 MIS programs incorporated a great variety of courses within this area.

**Table 5.** People and Procedures Courses in Top 19 MIS Schools

Course Title	University
<b>Electronic Business Strategy, Architecture, and Design</b>	
Advanced Topics in Information Strategy and Economics	7B
Bus Proc & Comm Infrastructure	13
Business Process Excellence	3
Business Process management	16A
Business Process Management Systems	4
Computer Utilization in Business	3
Decision Processes	7B
Decision Support Systems	7B
Ecommerce	6
E-Commerce Info Structure	14
Economics of eCommerce	2

Course Title	University
Systems Analysis and Design Theory	16B
Systems Analysis, Design, and Implementation	7B
Systems Design	10
Systems Design and Electronic Commerce	15
User Interface design, Prototyping, and Evaluation	4

Many of these courses lie in the nature of Business Process Management and Enterprise Systems Analysis. The nature of the standards in ABET, for example, make it very difficult to include them in accredited programs.

### FUTURE RESEARCH AND CONCLUSION

To support the continuous improvement process for an institution’s IS program, the ABET-CAC Board of Governors is pursuing changes to improve the standards and criteria for IS accreditation including flexibility to adjust and adapt the curriculum. The direction appears to focus on the exploration of merging and emerging technologies for programs and disciplines such as biological engineering and the merging and emerging of disciplines themselves such as computer science and information systems [1]. This does not, however, remove the problem of public awareness regarding the nature and context of IS programs. It can be seen that none of the top 19 MIS programs fully encompass the ABET curriculum. This is, for the most, the result of other than ABET accreditation restrictions. Furthermore, because of ABET’s historical engineering and science context, there has not been a focus to fully integrate business into the curriculum although there is requirement to have a number of stand-alone business courses.

Programs offered today may blend in the future and become more interdisciplinary where economic and market driven constraints, due to shrinking enrollments, may drive towards a “generalist” IS program. Courses on business, mathematics, science, social studies and communications will continue as prerequisites for IS programs, while higher level and capstone courses will concentrate on the integration of these courses through technology oriented courses in programming and analysis. To meet that evolution, ABET-CAC is currently revising its accreditation model into a more “outcome focused” process,

thereby resulting in a more non-prescriptive curriculum criterion [1].

A pilot of the revised model will occur at selected institutions starting in Fall 2006. From the results on the pilot, ABET will either recommend the new, outcome based ABET-CAC accreditation model starting in Fall 2007 or revise the model with a targeted Fall 2008 startup date [2].

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