Investigating the Introduction to IS course content: Do Faculty, Recruiters, and Students Equally Value Topical Areas?

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ABSTRACT

This research focuses on the possible impact the value and demand for IS knowledge have on Information Systems (IS) course topical coverage. Over the last years, enrollments in MIS programs have been declining with some programs shutting down completely. Although all majors in a Business School are typically required to take the Introduction to Information Systems course, the real or perceived value to businesses and future employers is unclear. In this paper, we examine the content of the Introduction to IS course recommended by the Association of Computing Machinery (ACM) /Association of Information Systems (AIS) from the perspective of three stakeholders, namely students, faculty and recruiters. The Discussion section addresses where stakeholders are in agreement as well as where they hold differing views about the value and relevance of topical areas.

Keywords
Introduction to IS course, IS Curriculum, Foundation, Content

INTRODUCTION

Since 2001 enrollment in Management Information Systems (MIS) programs has been declining and a number of MIS programs in Business Schools have been shut down (Frankel, 2008; Regan, 2008). In other cases, MIS offerings have been trimmed down or relegated to faculty in other departments who are often not as well equipped as MIS faculty to teach the material. Some news outlets have gone so far as to recommend that students avoid MIS as a major area of study (Kolovik, 2013; Loose, 2012). This has led Business Schools and MIS departments to reevaluate the value provided by an MIS degree in general and, more specifically, the Introduction to IS course. The declining enrollments are so widespread that ACM/AIS has, in fact, redesigned its curriculum partly in the hopes of guiding university programs and reversing the trend (IS 2010). Typically, all majors in a Business School are required to take the Introduction to IS course; however what real or perceived value this course provides is unclear. If some colleges are debating whether to remove the Introduction to IS course from the curriculum, then the implication is that the perceived value is lacking. In this paper, we examine the content of the Introduction to IS course recommended by ACM/AIS from the perspective of three stakeholders, business students, business faculty and recruiters, using a survey methodology.

The paper is structured as follows: the next section identifies the stakeholders of the Introduction to IS course and outlines the importance that IS plays in their lives. We then address prior research on factors affecting the IS course content and its value; we review the current curriculum designed by ACM/AIS members. Then, the study which we undertook is detailed: a survey instrument was distributed to faculty members, recruiters and students to gauge the value that these stakeholders assign to the topical areas. The next sections report the results from our study and provide discussion of our findings.

STAKEHOLDERS OF THE INTRODUCTION TO IS COURSE CONTENT

It is important that the content of the Introduction to IS class is valued by those who are enrolled in it, those who are teaching it, and those who will ultimately benefit from it, the potential recruiters of business graduates. It is also critical that non-IS faculty value the Introduction to IS course since information systems affect every student and every major in the college and...
knowledge of IS topics will benefit them throughout their career. Regardless from what major students graduate within the business school, they will be required to take the Introduction to IS course. Hence, it is vital that the content of this course be valued by the students, all faculty in the business school and the employers of business school graduates. Although our study was conducted in 4-year degree granting institutions, the topics covered in the Introduction to IS course are important, valuable, and relevant to programs in technical schools as well.

Because there are many stakeholders of the Introduction to IS course content, it is imperative that the content of the class be closely scrutinized so as to add as much value as possible. Beyond choice of major, course content which is not valued may be avoided so that non-IS majors may not even engage the basics of IS that all students should have to be adequately prepared for their business careers.

STUDY

As universities chase student dollars to stay afloat in these turbulent economic times, some are focusing heavily on the student experience. Although most would agree that the student experience is important, some wonder if we are doing long-term harm to students by adjusting course content to make them happy in the short-term while making them far less marketable in the long-run, and failing to meet recruiter needs. In the case of IS majors/minors, recent comments by students lead many to believe that the content of the Introduction to IS course content may not be fully appreciated by the student stakeholder. And if this is true, it could be a leading factor in decisions to choose other majors/minors. Before making drastic curriculum changes, however, this study looks to examine the content of the Introduction to IS course and seek opinions from not only students, but also faculty members and recruiters. We can then see the differences in how each group values specific content in the course.

COURSE CONTENT FOR INTRODUCTION TO IS COURSE

We start by reviewing the typical content of the Introduction to IS course. The Association for Information Systems (AIS) has worked for many years in designing not only the recommended content of the Introduction to IS course but also recommendations for the entire IS major curriculum. We start there, and supplement with topics from leading IS textbooks to create a list of recommended content.

Curriculum from AIS

In 2008 a select committee formed jointly by members of both the Association of Computing Machinery (ACM) and the Association of Information Systems (AIS) was tasked with developing a set of recommended topics to be included in all Introduction to IS courses taught at accredited universities around the world. The committee proposed topics based on discussions with IS professionals and IS academicians. Their final report proposed the following ten Information Systems topic areas: Globalization, IS Components, IS and the Organization, IS Valuation, Infrastructure, WWW and the Internet, System Security, Business Intelligence, Ethics, and IS Development (IS 2010).

IT Globalization was highlighted by stressing the need to have a thorough grasp of technology-enabled change as well as an understanding of the digital divide. The committee also recommended that classes include information on global IT strategies and the importance of cross-cultural issues associated with the various strategies pursued by corporations with a worldwide footprint.

The second topic recommended was a study of the Components of an Information System. This section covers the basics of IS to include hardware and software availability and use, and how systems capture, store and utilize data. It also includes the study of networks and network components as well as location considerations and facilities management.

IS and the Organization was listed as a study topic and included sections on IS career opportunities and potential, IT project valuation, IS quality and familiarization with the various measures available to determine it, IT strategies, and how organizations can use IT to gain and maintain a competitive advantage.

IS Valuation was a separate topic area that the committee suggested and included a section on familiarization with the skills and knowledge necessary to appropriately value IT. This included sections that discussed the productivity paradox as well as various IT investment analysis tools. The committee determined that a good foundation in systems evaluation was essential for all business majors.

IS Infrastructure and infrastructure requirements was also included in the list of topic areas and the committee listed several key elements that were important in this section. These included computer system hardware components, system software components, data and data storage requirements, and maintenance, as well as attention to IT services and support.
The Internet and the WWW is also a key topic that should be addressed by all Introduction to IS classes. Key elements in this topic area include e-Commerce and e-Business. The committee also recommended a section on e-Government, as well as familiarization with the many social networking applications that are used by many computer users today. A section on Intranets and their characteristics and purpose was also recommended.

Another topic area the committee included was system security and the highlighted areas to be covered. Subtopics were listed and these were 1) Security Awareness to include teaching the students about the many security threats that a system is potentially exposed to as well as the human and technological safeguards that are available to keep them secure and 2) Security Management techniques that familiarize the student with system security planning issues and techniques.

Business Intelligence and the various decision-making tools that are available to organizations was also an important topic area. Several subtopics of interest include 1) Knowledge Discovery tools, 2) System Applications and Utility Tools, 3) Digital Dashboards and their use to management, as well as 4) Geographic Information Systems (GIS).

Ethics as a stand-alone topic was highlighted, and with the continued instances of unethical actions and behaviors by many in leadership roles, can never be highlighted enough. In this topic area the committee listed privacy issues and the different privacy expectations and rules in place across the world as an important area of study. The EU has much more stringent privacy laws than the USA and it is important to realize that privacy issues are important when designing and developing an IS. Data accuracy and information standards were also listed as important areas of study. The committee also recommended study modules on cyber war, cyber terrorism, computer crime, as well as the available tools to help find and prevent the continued occurrence of these actions (e.g., Computer Forensics).

The final topic area the committee recommended was Systems Development and the need to teach students a thorough overview of the tools available in analysis and design tasks. A section on system development life cycles as well as alternative methods to system design was recommended. The committee also listed the need for IS professionals to understand the importance of user driven design and the potential benefits and risks associated with outsourcing systems development projects.

### Course Content Coverage from IS Textbooks

With the list of topics recommended by the select committee on IS Curriculum in mind, we reviewed some of the top IS/IT textbooks to compare their focus with the committee's recommendation. We found that many of the textbooks included chapters on most of the recommended topics as given by the committee on IS curriculum. While not every textbook author included every single topic area, for the most part all textbooks covered the main topics and touched on many of the subcategories as listed above. The table below shows the main topic areas as listed by the select committee and then indicates which authors covered the topics listed. While some authors chose slightly different names and included chapter sections on related or similar topics, the majority covered the recommended topic areas.

<table>
<thead>
<tr>
<th>ACM/AIS Topics</th>
<th>O'Brien/Marakas</th>
<th>Laudon/Laudon</th>
<th>Haag/Cummings</th>
<th>Baltzen/Phillips</th>
<th>Kroenke</th>
<th>Huber et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS Components</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>IS and the Organization</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Globalization</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>IS Value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>IT Infrastructure</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>WWW/Internet</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>IS Security</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Business Intelligence</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>IS Ethics</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>IS Development</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 1. ACM/AIS Curriculum vs Textbook Topic Coverage
RESEARCH METHOD

Using the topics and subtopics from the AIS curriculum, this study utilized a web-based survey instrument to collect data from faculty members, recruiters, and students. The faculty members were solicited from a well known AIS listserv. Of the 352 faculty who agreed to participate, total usable responses were 252. Recruiters were solicited through campus recruiting from a large Northeastern university. Of the 152 recruiters that agreed to participate, we received 64 usable responses. Finally, students were recruited from 3 medium to large US universities. Of the 285 who agreed to participate, 256 were usable.

ANALYSIS AND RESULTS

In order to test how well these stakeholders value the content, we used SPSS version 20 to compare the means of the combined items under each topic across each stakeholder. Individual topic areas were made up for between 3 and 5 items, which were averaged to form the comparison topic area. Although we hoped all three groups are well aligned, it was unlikely that this would happen.

It is important to see how these stakeholders value each topical area, so we can have direction as to what to add, delete, or possibly change from the Introduction to IS course.

The tables below detail the means for each topic area for each of the stakeholders. These means are on a 7 point scale (where 1 is Strongly Disagree and 7 is Strongly Agree and refer to the importance assigned to each topic) and are significantly different at the .05 level.

IT Globalization. From the analysis, faculty and students view topics related to global IT strategies, cross-cultural issues and technology-enabled change as more important than recruiters do.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Faculty</th>
<th>Recruiters</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Globalization</td>
<td>5.92</td>
<td>5.31</td>
<td>5.82</td>
</tr>
</tbody>
</table>

IS Components. Faculty and recruiters consider that topics that fall into the IS component category are more valuable than students consider them to be. This topic includes basic hardware and software issues, data capture, storage and use, and networks.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Faculty</th>
<th>Recruiters</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS Components</td>
<td>5.732</td>
<td>5.588</td>
<td>5.299</td>
</tr>
</tbody>
</table>

IS and the Organization. Recruiters and student perceive topics such as IT project valuation, IS quality, IT strategies, and how organizations can use IT to gain and maintain a competitive advantage as less significant than faculty do.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Faculty</th>
<th>Recruiters</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS and the Organization</td>
<td>6.179</td>
<td>5.450</td>
<td>5.584</td>
</tr>
</tbody>
</table>

IS Valuation. Similar to the IS and the Organization topic faculty consider issues relating to the skills and knowledge necessary to appropriately value IT more critical than either recruiters or students.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Faculty</th>
<th>Recruiters</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS Valuation</td>
<td>6.03</td>
<td>5.52</td>
<td>5.31</td>
</tr>
</tbody>
</table>

IS Infrastructure. While faculty and recruiters perceive as important topics such as computer system hardware components, system software components, data and data storage requirements, and IT services and support, students rated those topics as less important.
The Internet and the WWW. All three stakeholders deem the Internet and the WWW as different in the topic’s importance and relevance. Students rate it the highest in terms of importance, followed by faculty and recruiters.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Faculty</th>
<th>Recruiters</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS Infrastructure</td>
<td>5.919</td>
<td>5.775</td>
<td>5.502</td>
</tr>
</tbody>
</table>

System Security. There is no significant difference among the three stakeholders with respect to security issues. Faculty, recruiters and students all deem System Security a worthwhile topic to cover.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Faculty</th>
<th>Recruiters</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Security</td>
<td>6.266</td>
<td>6.066</td>
<td>6.172</td>
</tr>
</tbody>
</table>

Business Intelligence. While faculty and students differ in their perceptions of the value of Business Intelligence (with faculty rating it higher in importance), recruiters rate it slightly higher than students.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Faculty</th>
<th>Recruiters</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Intelligence</td>
<td>5.713</td>
<td>5.481</td>
<td>5.455</td>
</tr>
</tbody>
</table>

Ethics. While there is no significant difference between how faculty and recruiters view the worthiness of Ethics, students deem the value of Ethics as significantly different from both faculty and recruiters. Student rank the importance of Ethics as higher than the other two stakeholders.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Faculty</th>
<th>Recruiters</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethics</td>
<td>5.875</td>
<td>5.669</td>
<td>6.047</td>
</tr>
</tbody>
</table>

System Development. Faculty consider issues such as tools for analysis and design tasks, alternative methods to system design, and recognizing the importance of user driven design as essential. Recruiters and students give these topics less importance.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Faculty</th>
<th>Recruiters</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Development</td>
<td>6.00</td>
<td>5.49</td>
<td>5.48</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Taking into account the topics covered in the Introduction to IS course, faculty members agree with recruiters on the importance of IS Components, IS Infrastructure, and Ethics. To faculty and recruiters, having a good grasp of the basics in terms of hardware and software issues, data and data storage requirements, and IT services and support is essential, while the study of Ethics is deemed less so. This may be because faculty and recruiters feel that courses that make up the IS curriculum are not the appropriate venue for the teaching of Ethics. Faculty members agree with students on the importance of IT Globalization, rating it higher than recruiters. Recruiters and students seem to agree that there is some value to topics such as IS and the Organization, IS Valuation, and System Development; faculty members, however, rank it at a higher level of importance. Finally, all three stakeholders agree on the value of the topics of the Internet and the WWW, and System Security, rating them highly.
As the analysis revealed, faculty and students view topics related to global IT strategies, cross-cultural issues and technology-enabled change as more important than recruiters do. This could be due to the recruiters sampled not having international responsibilities (only recruiting for a US office), thus not recognizing the importance of global IT as much as faculty and students. This topical area was deemed especially relevant in the curriculum redesign by ACM/AIS as the importance to support global needs is increasingly critical.

Based upon our analysis, faculty and recruiters consider that topics that fall into the IS component category are more valuable than students consider them to be. This topic includes basic hardware and software issues, data capture, storage and use, and networks. General business students might consider these topics more technical in nature (outside of area of interest). Faculty members are recruiters see it as a building block and consider that an understanding of these issues is important before being able to fully appreciate the more senior management/strategy topics.

The above results suggest that recruiters and students perceive topics in the IS and the Organization category, such as IT project valuation, IS quality, IT strategies, and how organizations can use IT to gain and maintain a competitive advantage as less significant than faculty do. This is likely due to faculty having a ‘bigger picture’ insight/long term view of the application of IT. Recruiters and students are likely focusing more on immediate needs and immediate skill sets.

Similar to the IS and the Organization topic faculty consider issues relating to the skills and knowledge necessary to appropriately value IT more critical than either recruiters or students. As detailed above, faculty tend to have a longer-term perspective on issues like this compared to recruiters and students. IT Valuation, similar to IS and the Organization, is definitely higher level.

As per our findings, faculty and recruiters perceive IS infrastructure topics, such as computer system hardware components, system software components, data and data storage requirements, and IT services and support, equally important. Students, however, rated those topics as less important. Faculty and recruiters are looking at multiple skills, a broader skill set (and think that is necessary), while students want to stay away from more technical issues. It has been long viewed that MIS students within the business school are less interested in the more technical side of IS, leaving those areas to for more technical programs like computer science.

All three stakeholders deem the Internet and the WWW as different in the topic’s importance. Students rate it the highest in terms of importance, followed by faculty and recruiters. Students live for the web – everything they do is web-related (social networks, shopping, music, etc.). Students might feel that knowledge of the web is going to be very important to them while recruiters see it less so (unless they are recruiting for a social network position). Recruiters might see this topic as more of a distraction, rather than a legitimate skill to have. Faculty members certainly have experienced the frustration of the Internet on student-held devices used in class.

There is no significant difference among the three stakeholders with respect to Security issues. Faculty, recruiters and students all rate System Security a worthwhile topic. This is not surprising given that security is a standard tool that all systems and organizations have to hone. Also, because of e-commerce, cloud computing, etc. security is in the news and at the forefront. Interestingly, this is the only topic where all three stakeholders are in agreement.

Our findings reveal that, there was no statistical difference between faculty and recruiters on Business Intelligence. Interestingly, there was no statistical difference between recruiters and students. This is due to the close means with recruiters falling in between faculty and students in rating the importance. The likelihood for the difference between faculty and students is that faculty view having more skills is more desirable than having fewer when it comes to Business Intelligence. Given the more technical skills required to conduct business intelligence, and the desire of many students to avoid the more technical aspects of IS, this was somewhat expected.

Students rated Ethics as significantly more important than both faculty and recruiters. This is an interesting finding, but perhaps explained by the rise of the general topic, especially in the areas of computer forensics and accounting forensics.

Finally, the analysis revealed that faculty members consider System Development issues such as tools for analysis and design tasks, alternative methods to system design, and recognizing the importance of user driven design as essential content of the Introduction to IS course. Recruiters and students give these topics less importance. In addition to System Development being the historical foundation of the IS field, faculty tend to feel that having more skills in this area is advantageous. Again, students in business schools tend to avoid more technical topics leaving those to computer science students. Given the focus of recruiters in this sample, it is likely that, overall, they find business skills to be more important than technical skills.
POSSIBLE IMPLICATIONS

As stated above, it was possible, but unlikely, that all three stakeholder groups would value the IS content equally. It is important to note that in the ACM/AIS curriculum evaluation, students were not consulted as to the importance of the IS topics. The outcome of the study, however, demonstrates that these stakeholders differ in their opinions on the importance of each topic area. Although some would consider recruiters as a leading authority in what should be taught, as they do the hiring, we should not automatically discount the opinions of students. Of course, faculty members are primary to this discussion, as well. We suggest that the academic community and the ACM/AIS curriculum developers review the results above and use them as a springboard to important conversations on the topics we teach. At some point, necessary changes may need to be made to make the curriculum fit the needs, but also be more appealing to students. In addition, where the recruiters and students agreed, care should be taken by faculty to adequately communicate the importance of the topic.

CONCLUSIONS

This research attempted to investigate how faculty, recruiters, and students value the content of the Introduction to IS course. IS enrollments have been in decline for years and the value placed on the content by students could be one explanatory factor. The preliminary results outlined here provide some insight into the importance placed on these topics by each stakeholder group.

REFERENCES

1. Association of Information Systems - http://enrollments.aisnet.org/Surveys%20of%20Stakeholders.ashx
Appendix: Sample Survey Instrument (Student)

MEASURING THE VALUE OF MIS EDUCATION
(Student)

Age __________ Gender _______________ School Year/Classification F (1st) S (2nd) J (3rd) S (4th)

Academic Major __________________________ Academic Minor __________________________

Please rate the extent to which you agree with the following statements as they relate to you as you prepare to enter the job market. The listed MIS (Management Information Systems) categories are generally taught at Colleges of Business in both the United States and Internationally. Please respond to each item using the following scale:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Somewhat Disagree</td>
<td>Neutral</td>
<td>Somewhat Agree</td>
<td>Agree</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

GLOBALIZATION
It is important to understand …

1. IT globalization issues ................................................................. 1 2 3 4 5 6 7
2. technology enabled change .......................................................... 1 2 3 4 5 6 7
3. the digital divide and the implications of that assumption ............ 1 2 3 4 5 6 7
4. global IT strategies and the numerous cross-cultural issues associated …. 1 2 3 4 5 6 7

IS COMPONENTS
It is important to have an understanding and knowledge about …

5. information system hardware components ...................................... 1 2 3 4 5 6 7
6. software and its uses & value ....................................................... 1 2 3 4 5 6 7
7. data and how systems utilize/process it ........................................... 1 2 3 4 5 6 7
8. networks and be able to identify specific components of a network …... 1 2 3 4 5 6 7
9. facility requirements for IT utilization ............................................. 1 2 3 4 5 6 7

IS and ORGANIZATIONS
It is important to have an understanding and knowledge about …

10. various information systems career fields ...................................... 1 2 3 4 5 6 7
11. system quality and the various ways it is measured ........................... 1 2 3 4 5 6 7
12. competitive advantage as it relates to IS ........................................ 1 2 3 4 5 6 7
13. strategy as applied to information systems....................................... 1 2 3 4 5 6 7

IS/IT VALUATION
It is important to be able to value systems for an organization ………. 1 2 3 4 5 6 7
15. The ability to make the case for IT is a necessary skill/knowledge set ... 1 2 3 4 5 6 7
16. It is important to understand the IT productivity paradox .................. 1 2 3 4 5 6 7
17. It is important to possess the ability to evaluate IT investments and determine their value to the organization ................................. 1 2 3 4 5 6 7
**INFRASTRUCTURE**
It is important to have knowledge …

18. of typical system hardware components ……………………... 1 2 3 4 5 6 7
19. of system software ……………………………………………. 1 2 3 4 5 6 7
20. of collaboration and potential business benefits ……………. 1 2 3 4 5 6 7
21. and understanding of data and information and their roles in systems … 1 2 3 4 5 6 7
22. of the role of IT services ………………………………………... 1 2 3 4 5 6 7

**WWW and the INTERNET**
It is important to understand …

23. E-business and its potential ……………………………………... 1 2 3 4 5 6 7
24. E-government and its potential uses ……………………………. 1 2 3 4 5 6 7
25. Intranets and how they are established and used in business … 1 2 3 4 5 6 7
26. social networking and its potential uses ………………………. 1 2 3 4 5 6 7
27. Wikis, Blogs and other technological capabilities used by the media, businesses, and the general population ……………………. 1 2 3 4 5 6 7

**SYSTEM SECURITY**
It is important to understand …

28. security threats that a system potentially encounters ………… 1 2 3 4 5 6 7
29. the various technological safeguards available …………………... 1 2 3 4 5 6 7
30. the various human safeguards available ………………………. 1 2 3 4 5 6 7
31. security management issues and techniques ……………………… 1 2 3 4 5 6 7
32. system security in order to help identify and build potential security plans to prevent data loss or compromise …………………... 1 2 3 4 5 6 7

**BUSINESS INTELLIGENCE**
It is important to understand …

33. decision making systems (DSS, ESS, etc) and their capabilities … 1 2 3 4 5 6 7
34. how systems assist in knowledge discovery ……………………… 1 2 3 4 5 6 7
35. software applications and utilities ……………………………….. 1 2 3 4 5 6 7
36. digital dashboards and how they are used ………………………. 1 2 3 4 5 6 7
37. geographic information systems (GIS) …………………………. 1 2 3 4 5 6 7

**IS ETHICS and CRIMINAL ACTIVITY**
It is important to know and understand …

39. privacy issues and regulations …………………………………… 1 2 3 4 5 6 7
40. that accuracy is important with data and information standards … 1 2 3 4 5 6 7
41. cyber war in the global environment ……………………………. 1 2 3 4 5 6 7
42. cyber terrorism and any potential implications …………………. 1 2 3 4 5 6 7
43. current and future cyber criminal actions and techniques ………. 1 2 3 4 5 6 7

**SYSTEMS DEVELOPMENT**
It is important to be familiar with …

44. systems development lifecycles (SDLC) …………………….…….. 1 2 3 4 5 6 7
45. external acquisition considerations ……………………………… 1 2 3 4 5 6 7
46. outsourcing and potential benefits/drawbacks ……………………. 1 2 3 4 5 6 7
47. the various alternatives to the traditional SDLC …………………. 1 2 3 4 5 6 7
48. user driven development ………………………………………….. 1 2 3 4 5 6 7