

Alumni Perceptions Regarding Organizational & End-User Information System Curricula for a Knowledge-Based Economy

Co-authors:

C. Steven Hunt
Morehead State University
Department of Information Systems
Combs 315, UPO Box 868
Morehead, KY 40351-1689
Email: c.hunt@moreheadstate.edu

Tena B. Crews
University of South Carolina
Technology Support and Training Management
Carolina Coliseum 118B
Columbia, SC 29208
Email: tcrews@gwm.sc.edu

Susan Feather-Gannon
Pace University
Goldstein Center
861 Bedford Road
Pleasantville, NY 10570-2799
Home Address: 826 Van Wagner Road
Poughkeepsie, NY 12601-6504
Email: sfeathergannon@pace.edu

Darla Hunt
Morehead State University
Department of Information Systems
Combs 304—UPO Box 868
Morehead, KY 40351-1689
Email: d.hunt@moreheadstate.edu

Keywords: Organizational & End-user Information Systems, OEIS, Information Technology (IT) curriculum development, information systems education, information management, end user computing, undergraduate programs

ABSTRACT

The objective of this research was to determine the perceptions of organizational & end-user information systems alumni from selected colleges and universities in the U.S. regarding the newly reengineered Organizational & End-User Information Systems (OEIS) Model Curriculum that was sponsored by the Organizational Systems Research Association (OSRA). This organization has again taken the lead in ascertaining the competencies that information technology specialists and end-user support personnel should acquire for entry-level employment. This model curriculum, a major update of the 1996 version, breaks new ground by emphasizing the technical aspects of information technology at the desktop of end users in our web-based, digital economy.

Specific objectives were (1) to determine the perceived level of importance of the OEIS curriculum content and objectives and (2) to ascertain alumni perceptions regarding the overall importance of the objectives. The results of this study will further assist in the solidification and validation of specific competencies needed by IT professionals as well as provide academicians with vital professional opinions that will have the potential to influence future updates to the Model Curriculum.

THE PROBLEM

The changing e-commerce and enterprise-wide initiatives, as well as business applications at the desktop level in organizations, have continued to place pressure on organizational and end-user information systems (OEIS) undergraduate programs to undertake continuous curriculum innovation. "Much of the change in the IT field is a result of advances in technologies, such as networking, telecommunications, information security, the Internet, and collaborative technologies" (Daniels and Feather-Gannon, 2003, p. 7). Given these trends and emerging technologies, the Organizational Systems Research Association (OSRA) has sponsored and selected a national task force to re-engineer their 1996 Model Curriculum. The newly-designed 2004 framework has been developed by an international group of OEIS faculty and IT practitioners. However, an inadequate research base of knowledge currently exists that solidifies the importance of these objectives as perceived by information technology alumni.

REVIEW OF THE LITERATURE

Need for Current IT Curricula

Over a decade ago, Trauth and Farwell (1993) identified a gap between industry expectations and academic preparation. This gap emphasizes the need for curricula and course updates so that institutions are providing students with the essential skills needed upon graduation. "Because of the changes that are sweeping across corporate America, universities have had to respond with curriculum modifications preparing students for a new type of workplace" (August and Caouette, 1998, p. 37). In tandem with dramatic corporate environmental changes, "The number of workers in the computer and software industries has almost tripled in the past decade" (Freeman and Aspray, 1999, p. 35). Moreover, preparing students to become competent Information Technology (IT) employees with well-rounded skills is a goal of post-secondary departments with an end-user support system focus. The driving force behind these changes in business and economic growth has been the demand for well-prepared IT professionals.

Consequently, academia faces the difficult task of providing an up-to-date curriculum in an environment that is constantly changing. This only emphasizes the need for educational institutions to bridge the gap and produce qualified graduates who will become eligible applicants for the available positions in the IT world. Those responsible for teaching key courses in the area of end-user information systems (EUIS) must ensure that the curriculum produces graduates equipped with the essential skills necessary to advance in the job market or to a higher level of education. The IT industry currently employs many young workers; almost 80 percent of the computer programmers and approximately 75 percent of computer systems analysts and computer scientists are under the age of 45 (Mears & Sargent, 1999). Therefore, post-secondary institutions are charged with the responsibility to educate students to become highly-skilled employees in the IT field.

Research by Gonzenbach (1998) resulted in the recommendation that when teaching in the area of information systems, most emphasis should be placed on teaching the following: telecommunications, operating systems, systems analysis and design, networks and business communications. A combination of these skills will help provide students with the necessary aptitude to be competitive in the information technology (IT) workforce. The continued development in e-commerce, wireless networks, and further advances in technology will only increase the need to update skills in the area of IT. As technology advancements occur, it is necessary to look toward new trends and issues in the area of IT and end-user computing. Security is an important element in IT and will continue to heighten its level of importance in the future. Network security and password encryption are also gaining increased attention as businesses and educational institutions install wireless networks. Due to the access to data and the flaws in network topologies, improved security is critical. Improved security standards are being developed by the Institute of Electrical and Electronics Engineers (IEEE). Network administrators are learning how to update, maintain, and protect their data, users, and investment in telecommunications environments without wires.

Need for IT Workers

The IT environment consists of a wide variety of technological challenges to prepare IT graduates. As the IT environment rapidly changes, this poses a challenge not only for Management Information Systems (MIS) managers, but also for academicians (Maier, Clark, & Remington, 1998). In an effort to prepare IT students for the work world, obtaining input from professionals in the field is essential.

It is obvious that the need for Information Systems (IS) workers is growing and in demand, but the identification of the specific skills required for the variety of IS positions is not as clear (Noll & Wilkins, 2002). Management Information Systems (MIS) managers are challenged by trying to find competent workers for their positions. The proliferation of the Internet, security, data growth, and data management also pose challenges for MIS managers. This challenge is enhanced by the constant change in information systems. Straub and Watson (2001) note that “with the explosion of the Internet and other networks (e.g., cell phone, cable TV, satellite downlinks and uplinks), systems that have been the historical focus of IS research are being rapidly transmogrified” (p. 1).

The IT Association of America (ITAA) released findings from a study that discussed the current availability and skills of IT workers in the United States. Findings from the study (ITAA, 2002) showed a deficit of skilled IT workers and that this deficit inhibits the profitability and productivity of corporations.

Importance of End-User Information Systems Skills

Forecasts reveal that businesses which will dominate the global economy of the future will be information, technology, or knowledge-based organizations. Against this

scenario, the emerging information technologies are also requiring a new breed of IT professional—a person who understands the needs of the business as well as IT and its potential for enhancing productivity at the desktop. Moreover, the *Occupational Employment Projections to 2008* has revealed a 102% escalated growth in new positions for the IT area (Bowman, 1999).

Although many people believe that for prospective employees to be competitive in the IT market, programming is essential to their repertoire, Meares and Sargent (1999) reported in the U.S. *Department of Commerce Technology Administration Office of Technology Policy* that programming positions did not grow as rapidly (2.2%) during the 1983–1998 period as other IT related positions. Further, it is projected that numerous IT related careers will grow from 1.5 million in 1996 to 2.6 million in 2006. “During this period, the United States will require more than 1.3 million new highly skilled IT workers in these occupations – an average of about 137,800 per year – to fill newly created jobs (1,134,000) and to replace workers who are leaving these fields (244,000)” (Meares & Sargent, 1999, p. 25).

The OEIS area of concentration in a curriculum prepares undergraduates who *bridge the gap* between the developer of information systems and the typical end-users of computers. This area of concentration also gives emphasis to understanding how IT contributes to individual and work group performance in the digital economy. Programs in OEIS often equip students for *non-programming*-related job opportunities and specifically for entry-level career titles such as: software trainer, PC support specialist, technology coordinator, Web designer, helpdesk administrator, network analyst, and other mid-level positions, such as process improvement manager or director of online learning.

RESEARCH DESIGN

The Sample

Participants in the study represented a selected group of alumni from Morehead State University, Pace University, University of South Carolina, and Southern Illinois University-Carbondale. The researchers emailed a letter explaining the Web-based survey project and specifics of the model, to the selected population. A total of 40/117 (34%) alumni responded during the four weeks following the initial email submission.

The objectives of the courses in the OEIS curriculum model provided the basis for the instrument developed to seek the opinions of alumni regarding the curriculum. The web-based instrument required participants to assess the importance of each of the objectives on a 5-point Likert-type scale. Responding to the question *What is the level of importance of each of the following potential objectives of a curriculum specialization in Organizational & End-User Information Systems (OEIS)*, participants rated the level of importance for each objective on the following scale: 5 = critical importance; 4 = considerable importance; 3 = some importance; 2 = little importance; and 1 = no importance. No effort was made to associate the objectives with individual courses in the

model, given that the topics are often covered at more advanced levels in a number of courses.

Participants also provided demographics regarding job titles, size of their organizations, and the nature of their respective organizations. They also provided other evaluations of the model and provided feedback regarding courses which have been helpful to them in the workplace.

RESULTS OF THE ANALYSIS

Given that Facilitate.com™ software (a group support system that includes a survey utility) was used, the descriptive statistics were received and tabulated weekly based upon the number of respondents. The analyses included the calculations of means and mean-ranks for the OEIS curriculum objectives. Figure 1 contains the item, the means, and ranks of the means for the curriculum objectives and the average response to the objectives as a whole.

For the analysis of the mean responses, a response in the range of 4.5-5.0 was interpreted to be an objective of *critical importance*; 3.5-4.9, *of considerable importance*; 2.5-3.49, *of some importance*; and 0.00-1.49, *of no importance*. The means ranged from a low mean of 3.3 to a high mean of 4.6. The overall assessment rating of 4.2 by the alumni indicated that the respondents found the curriculum (as a whole) to be of considerable importance. The mean evaluations and the aggregate evaluation indicate that, in general, the respondents found the objectives to be important for a program in organizational and end-user information systems.

FINDINGS/CONCLUSIONS

The demographic analysis showed that the majority of graduates (70%) have worked for their company only two years or less. This could be explained by the fact that the more recent graduates of the institutions involved in the survey felt a stronger affiliation to their institutions and were, thus, more motivated to respond to the survey. Approximately 58% are working in positions that are related to end-user computing. The overwhelming majority (85%) are also working for companies with more than 25 employees. However, less than half (40%) were able to acquire full-time information technology (IT) related employment immediately upon receipt of their degree.

Fifty percent or more of the graduates rated six OEIS topics to be of *critical importance* which are also shown in Figure 1.

- Demonstrate readiness for employment for an entry-level IT-related position through completion of an IT internship (75%).
- Install, configure, upgrade, and maintain software (58%).
- Set up and perform disk, directory, and file backups (58%).

- Assess user needs and recommend computer solutions (50%).
- Design cost-effective technical training, including new training and upgraded training (50%).
- Demonstrate an understanding of software systems maintenance and troubleshooting (50%).

These data further solidify the importance of an internship experience and validate that every institution should consider this as one of the most important components to an end-user-based curriculum. Additionally, 50% or more of the graduates' responses identified the following components to be of *considerable importance*.

- Explain how systems concepts can be applied to planning, design, implementation, and administration of end-user support systems (60%).
- Identify and prescribe solutions for commonly occurring helpdesk end-user problems (55%).
- Apply project management methodology and tools to the development of OEIS systems analysis and design projects (50%).
- Identify project objectives and end-user requirements (50%).
- Develop course delivery systems for end-user training (50%).
- Demonstrate effective use of online telecommunication applications and services (50%).

Therefore, understanding the systems development life cycle (SDLC) and analysis and design side of an end-user support environment in combination with troubleshooting, i.e. helpdesk, project management skills, training program development, and using online telecommunications are perceived by alumni of end-user computing programs to be essential components to an effective end-user curriculum.

Graduates have obtained positions with a variety of job titles. Position titles ranged from *systems analyst* to *end-user support specialist*. Some titles noted *end-user in customer service*, but approximately 12 of the 33 submitted position titles obviously dealt with technology, troubleshooting, and/or analysis and support, which would help to explain why alumni perceived the components listed above to be either *critically* or *considerably important*.

Graduates were also asked to reveal what specific courses in their end-user support undergraduate program have proven to be most valuable to them since gainful employment. The most common response was networking followed by web design, database, hardware, and training fundamentals. Other items mentioned were technical writing, project management tools, analysis and design, and systems security. Students did note that additional courses involving hands-on experiences and experiential learning arrangements would be beneficial. Other courses that were noted as necessary in existing programs were more computer systems support, more web design, advanced database, and a course in managing and supervising people. When rating the overall program from

which they received their degree, 80% indicated that their degree was of *considerable* or *critical importance*.

When comparing the OEIS Model Curriculum, the topics identified by alumni as of *critical* or *considerable importance* match course content in the new model. A description of these core and optional courses are shown in Appendix A. Graduates perceived the internship experience as being the *most critical* component of a curriculum. OEIS 7 (Internship) in the model is one of the seven (7) core courses. Additionally, OEIS 2 (Computer User Support), another core course in the model, covers software, troubleshooting, and file management skills identified by graduates as being of *critical importance*. User needs and recommended solutions are also covered in OEIS 2, thereby satisfying another of the perceived *critically important* topics. OEIS 4 (Technical Training & Delivery Methods) encompasses the design of cost-effective training solutions, also was identified as *critically important*.

Moreover, graduates ranked the ability to explain how systems concepts can be applied to planning, design, implementation, and administration of end-user support systems as high priority in the hierarchy of *considerably important* components of the curriculum. The OEIS foundations course (Organizational & End-User Information Systems) provides an introduction to many of these skills before students move into more in-depth courses in the OEIS model. These skills are further covered in OEIS 3 (Planning, Design, Implementation, & Evaluation). The remaining five components designated as components of *considerable importance* are included in OEIS 2 (Computer User Support), OEIS 3 (Planning, Design, Implementation, & Evaluation), and OEIS 4 (Technical Training & Delivery Methods).

The findings related to the value of coursework in the graduates respective institutions reinforced the need for networking (of *critical importance*)—OEIS 5 (Networking & Telecommunications) in the curriculum. Additionally, web design was identified as a *critical* component of the curriculum. OEIS 8 (eBusiness & Web Technologies), though considered an optional course in the OEIS model, allows the flexibility for schools of higher education to include web design as a component in the curriculum. OEIS 6 (Cases in IT) can also be designed to incorporate those areas deemed of critical importance. The optional courses allow programs to enhance student learning in collaborative learning technologies, network administration, security, and other special topics.

In summary, the graduates' perceptions of the model curriculum appeared to reinforce its effectiveness by identifying those concepts that were of value to them as they work in an IT environment. However, further research with other IT populations would be desirable to further validate the model. Moreover, as IT-related jobs evolve and as new technologies and job titles emerge, a need exists to review and revamp model curricula to adapt to these dramatic changes.

Figure 1—Alumni Ratings of Curriculum Objectives—Summary of Findings

<i>Components/Objectives of the OEIS Curriculum</i>	Mean	Std Dev	N Value
Demonstrate readiness for employment for an entry-level IT related position through completion of an IT internship.	4.6	1.0	40
Assess user needs and recommend computer solutions.	4.4	0.6	40
Set up perform disk, directory, and file backups.	4.4	0.9	39
Install, configure, upgrade, and maintain software.	4.4	0.9	40
Demonstrate an understanding of software system maintenance and troubleshooting.	4.3	0.9	39
Understand and apply the concepts and theories underlying the administration of information systems security.	4.3	0.8	39
Implement, monitor, and troubleshoot basic information, network, and Web security systems.	4.2	0.8	38
Describe characteristics of end-user work environments and the impact of information technology on work performance.	4.2	0.9	40
Identify project objectives and end-user requirements.	4.2	0.7	40
Design cost-effective technical training including new training and upgraded training.	4.2	1.0	40
Identify organizational and management issues related to the use of technology in the workplace.	4.2	1.0	40
Setup, install, configure and troubleshoot hardware.	4.2	0.9	40
Describe the concept of end-user technology support and differentiate possible approaches for providing such support to end-users.	4.2	0.9	40
Demonstrate an understanding of different operating system platforms.	4.1	0.8	39
Demonstrate an understanding of operating system installation, administration, and upgrading.	4.1	1.0	39
Identify human factor issues associated with the use of OEIS technologies.	4.1	0.8	39
Explain how systems concepts can be applied to the planning, design, implementation, and administration of end-user support systems.	4.0	0.6	39
Manage, configure, and troubleshoot networked software connections.	4.0	0.9	39
Assign users to groups and ensure adequate permissions on the network.	4.0	0.9	39
Identify problems and formulate solutions related to telecommunications and networking.	4.0	0.9	40
Examine and use current methodologies for information systems security design, implementation, and monitoring.	4.0	0.8	38

Function as an entry-level facilitator and team leader in a collaborative technology setting.	3.9	0.9	39
Create workplace design solutions to ensure worker comfort, safety, and productivity.	3.9	1.1	40
Demonstrate an understanding of the vocabularies and theories of telecommunications and networking.	3.9	1.0	40
Develop sufficient technical expertise to create informative Web pages.	3.9	1.2	39
Identify and prescribe solutions for commonly occurring Helpdesk end-user problems.	3.9	0.9	40
Apply project management methodology and tools to the development of an OEIS systems analysis and design project.	3.9	0.9	40
Demonstrate effective use of online telecommunication applications and services.	3.9	0.9	39
Discuss effective application of emerging communication technologies.	3.9	1.0	40
Investigate key functional aspects of Web-based applications.	3.8	1.1	39
Develop course delivery systems for end-user training.	3.8	0.8	40
Undertake review and benchmarking of information systems security practices, techniques, and methods for securing and organization's information assets.	3.8	0.8	39
Justify the desirability of strategic planning and how OEIS solutions can drive organizational goals.	3.8	1.0	40
Acquire the fundamentals of evolving Internet technologies and Web authoring using currently popular Web editor tools.	3.7	1.3	39
Understand the prevalent models for developing technical training materials.	3.7	1.1	40
Recognize and apply appropriate Web design to meet user requirements.	3.7	1.3	38
Evaluate the alternative solutions from both the end-user and technical perspectives.	3.7	1.0	40
Recognize the value of virtual, collaborative, Web-based groupware tools.	3.7	1.1	39
Articulate the relationships among various end-user information systems both from business and technical perspectives.	3.7	0.9	40
Consider and analyze the impact of information systems security on organizations and society.	3.7	1.1	39
Defend the selected OEIS solution in the context of real-world business problems.	3.7	1.0	40
Understand the principles of global and ethical consideration as related to end user information systems.	3.6	1.1	39
Understand the context of Internet process within the overall functioning of global organizations.	3.6	0.9	39

Practice knowledge management for effective organization and utilization of organizational knowledge in terms of its properties, resources, strategies, and outcomes.	3.6	1.0	39
Recommend learning and performance measures for the selected training type.	3.5	0.9	40
Report and document OEIS activities via oral presentations and supporting multimedia.	3.5	1.2	40
Develop a systematic implementation and evaluation plan for Knowledge Management in a realistic organizational environment.	3.5	1.1	37
Implement and use group decision support systems for managing knowledge in contemporary organizations.	3.4	0.9	39
Apply qualitative and quantitative methods of analysis through OEIS case studies.	3.4	1.0	40
Write and evaluate reports generated through multiple Helpdesk reporting solutions.	3.4	1.0	40
Evaluate alternative business models and strategies.	3.3	0.9	38
Overall Alumni Assessment	4.2	0.9	39

RECOMMENDATIONS/IMPLICATIONS

This research provides further evidence to educators and curriculum designers that the objectives established by the designers of the OEIS Curriculum Model are indeed valued by alumni of OEIS programs at selected colleges and universities. The implications are especially important for schools that have adopted only portions of the model's content. Moreover, given the importance of these curriculum objectives, venues should be explored by universities for offering these courses in an online environment.

Educators whose programs do not include an internship experience should consider adding some type of experiential learning experience. Educators whose programs already include an internship experience should assess the nature of internship experiences to determine what such experiences are related to end-user technology support in some way and redesign accordingly.

To supplement the findings of this study, further research to document the number of institutions following the curriculum is needed. Assessment of the extent to which individual programs are meeting curriculum objectives are also needed. The success rate of our alumni will continue to be determined by the extent to which OEIS objectives are implemented and the willingness of faculty to update and revise IT education based upon trends in the global workplace.

REFERENCES

- August, A. and Caouette, J. (1998). Matching Office Information Systems (OIS) curriculum to relevant standards. *Informing Science*, (1)2, 37-42.
- Bowman C. (1999). Employment outlook: 1998-2008 (BLS projections to 2008: A Summary), *Monthly Labor Review*, 122, (11). p. 4.
- Daniels, K., & Feather-Gannon, S. (2003). The development and revision of a model curriculum in Organizational and End-user Information Systems, *Information Systems Education Journal*, (1)53, <http://isedj.org/1/53/>. ISSN: 1545-679X.
- Freeman, P. and Aspray, W. (1999). The supply of information technology workers in the United States. Washington, D.C.: Computing Research Association.
- Gonzenbach, N. W. (1998). Developing an information systems curriculum with input from business and industry. *Office Systems Research Journal*, 9-14.
- Hunt, C. S., ed.(2004). Organizational & End-user Information Systems Curriculum Model for Undergraduate Education in Information Technology. Morehead, KY: Organizational Systems Research Association.
- Information Technology Association of America. (May 2002). Bouncing back: Jobs, skills and the continuing demand for IT workers. *ITAA Report Executive Summary*. Retrieved September 20, 2004 from the Dice Tech Jobs, Tech Talent web site: <http://www.dice.com/assets/docs/generic/itaa.html>
- Maier, J. L., Clark, W. J., & Remington, W. S. (1998). A longitudinal study of the management information systems (MIS) job market. *Journal of Computer Information Systems*, XXXIX(1), 37-42.
- Meares, C. A. and Sargent, J. F. (1999). The digital workforce: Building infotech skills at the speed of innovation. U. S. *Department of Commerce Technology Administration Office of Technology Policy*. Retrieved September 22, 2004 from the U.S. Department of Commerce web site: <http://www.technology.gov/Reports/itsw/digital.pdf>
- Noll, C. L. & Wilkins, M. (2002). Critical skills of IS professionals: A model for curriculum development. *Journal of Information Technology Education*, 1(3), 143-154.
- O'Connor, B. N., ed. (1996). Organizational and End-user Information Systems Model Curriculum. Springfield, MO: Office Systems Research Association.
- O'Connor, B. N. and Thomas, E. G., eds. (1986). The Office Systems Research Association's Model Curriculum for Office Systems Education. Cincinnati: South-Western Publishing Co.
- Hunt, C. Steven, C. Ray, and S. Echolts, (December, 1997). "A National Evaluation of a Curriculum Model for End-user Computing Support," *Journal of International Information Management*. 6, (2) pps. 1-18.
- Straub, D. W. and Watson, R. T. (2001). Research commentary: Transformational issues in researching IS and net-enabled organizations. *Institute of Operations Research and the Management Sciences*, 12 (4), 337.

Trauth, E. M., Farwell, D. W., & Lee, D. M. S. (1993 September). The IS expectation gap: Industry expectations versus academic preparation. *MIS Quarterly*, 293-307.

Appendix A

OEIS Course Descriptions Used in Developing Survey Instrument

***OEIS 1- Organizational and End-user Information Systems**

An overview of organizational and end-user information systems (OEIS)--technologies, business processes, and worker performance, this course emphasizes methods used to plan for and implement information technologies in the workplace. This course discusses advances in information systems hardware and software, emphasizing applications designed for technology end users are discussed. Emphasis is on understanding end-user needs and how to select or design systems to address those needs. Work flow and systems analysis methodology, work (re)design, organizational change, systems implementation, and management issues are covered. Basic computer literacy is assumed. As an introduction to the OEIS curriculum, this course provides an overview of course content covered in depth in future courses.

OEIS 2- Computer User Support

This course introduces the responsibilities of a computer user support specialist and develops skills for microcomputer troubleshooting. Students develop skills necessary to work with help desk and support center operations to better fulfill end user support needs. Students examine how to support and communicate with non-computer professionals; use a variety of software, remote management tools to evaluate support applications, call tracking, and statistical analysis of calls/issues. Students develop problem-solving skills and install, configure and troubleshoot microcomputer hardware and software. Prerequisites: computer literacy, demonstrated skills in using hardware and application software.

OEIS 3- Planning, Design, Implementation, & Evaluation

This course covers the four stages of OEIS development: assessment, design, implementation, and evaluation. Students learn methods and procedures that empower them to define and solve large-scale OEIS problems or address new opportunities. In studying the integration of hardware/software into jobs and the work environment, the course will give attention to various organizational development and management factors including strategic planning, techniques for developing ROI, planned change strategies, human factors, and job redesign. Students will complete a systems analysis and design proposal with special attention given to inter-organizational goals.

OEIS 4- Technical Training & Delivery Methods

This core course builds upon skills and knowledge acquired in OEIS 1, 2, and 3. Students briefly overview change management, learning, and training theory in conjunction with technical training practices, which are supportive of and conducive to, organizational and end-user information systems implementation where OEIS tools are to be integrated into the work environment. Students focus on the design, development, and delivery of technical training. Students investigate and apply delivery methods including both traditional and state-of-the-art techniques. Planned change strategies (including addressing resistance to change) for technology implementation are also addressed, along with the application of relevant theories and evaluation of technical training effectiveness.

OEIS 5- Telecommunications & Networking Foundations

This course provides foundation information and skills relating to telecommunications and networking in the business environment including conceptual information, telecommunication applications, networking fundamentals, and the use the Internet/intranets. Management issues and practical applications are an integral part of this course.

OEIS 6- Cases in Information Technology

As a capstone course, this class involves the analysis, synthesis, evaluation and application of advanced concepts, theories, principles, and skills associated with information technologies (IT) or other comprehensive OEIS capstone experience through case studies for developing the solution to business problems and redesigning business processes. The course is ideally taken in the student's last term before graduation.

OEIS 7- Internship

This course is designed to provide the senior-level student an experiential learning arrangement related to information technology in an approved on-campus site or off-campus site. Students may perform information systems trainer/consultant and/or end-user support duties. Students will meet periodically with the instructor to discuss problems and issues relevant to the area of organizational and end-user information systems. Compensation may or may not be granted for the internship/practicum.

****OEIS 8- e-Business & Web Technologies**

This course (or course stream—*foundation* and *practicum*) is dedicated to investigating principle aspects of implementing and administering Web-based applications for both non-profit and for-profit organizations, where the e-business aspect has gradually become an integral part of the entire business model. It will provide the students with a foundation in the fundamentals of evolving Internet technologies and Web authoring using currently popular Web development software. Topics include: E-Business models and strategies, Intermediate and advanced HTML, design principles of hypermedia, Website hosting and setup procedures, Web server administration, information security, Internet protocols, XML, dynamic PHP/MySQL Web content driven by back-end databases, and streaming media. The students will apply the knowledge and skills learned to create or redesign an actual e-business Website as the group project that utilizes recommended Website development practices. The students are required to publish their Website projects on the Internet and ensure that all features and functions are properly working.

OEIS 9- Collaborative Technologies & Knowledge Management

This course is designed to provide the senior-level OEIS student with an introduction to group decision support systems, electronic meeting management, desktop video conferencing, as well as other groupware applications. Students will be introduced to concepts fundamental to an understanding of groupware tools and various collaborative technologies for enhancing group processes and computer-mediated communication in today's digital economy. The course addresses a wide range of topics including implementation, design, electronic facilitation, as well as GSS as an enabling technology in business process reengineering, knowledge management and collaborative learning. Special emphasis will be placed on using groupware technologies and

systems to create, store, and distribute explicit and tacit knowledge within contemporary organizations. *Prerequisites: Management Information Systems or Senior Standing.*

OEIS 10- Network Administration

This course is designed to develop senior-level OEIS students' advanced network administration skills. Both client and server applications will be dealt with and a strong emphasis will be placed on network operating system software. Students will also be exposed to multi-vendor networking topics and specific course topics will include: Setting up and configuring a Working Web Server, Web Site Security using SLL, DNS (Domain Name System), DHCP (Dynamic Host Configuration Protocol), WINS (Windows Internet Naming Service), Remote Access, IP (Internet Protocol) Routing, IP (Internet Protocol) Security, NAT (Network Address Translators), and other core networking/internetwork applications.

OEIS 11- Operating Systems

This course will provide the theoretical foundation and skills required to install, troubleshoot, maintain, and support operating systems. A thorough survey of personal computer and intermediate server operating systems available today will be provided, including Windows, UNIX, Macintosh, and DOS. Topics include their functional similarities and differences, file management distinctions, installation procedures, printer and other peripheral device management, interoperation with legacy systems, maintenance, backup operations, and troubleshooting methods.

OEIS 12- Information Systems Security

Information Systems Security is an introduction to end-user systems security from a management aspect. The course emphasizes the methods for the management of information security through the development of policies, procedures, audits, and logs. It also provides an understanding of the methods used for identifying threats and vulnerabilities, as well as analyses of the legal, ethical, and privacy issues in information systems and discusses emerging technologies related to systems security.

***Bolded course titles** refer to the recommended core courses.

**Non-bolded titles refer to electives or optional courses in the curriculum based upon career paths.