

Program Review

Undergraduate Program in Business Informatics

Dr. Ben Martz, Chair, Business Informatics Department

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College of Informatics, Northern Kentucky University

Submitted to the Program Review Steering Committee and the Dean, College of
Informatics on February 15, 2007

1. **BRIEF PROGRAM PROFILE**

- a) **Name and Brief Description of the Program:** Bachelor of Science in Information Systems (BIS).

The major in Business Informatics prepares students for careers in business computing, including work as computer programmers, programmer/analysts, systems analysts, systems designers, database and data communications specialists, computer consultants and other professional-level occupations involving analysis, design, development, and management of computer-based information systems. The program combines technical skills, analytical techniques, business knowledge, and a systems perspective for integrating the computer within business processes such as transaction processing, quantitative analysis, project management, management information, and decision-support systems. In this sense, the term “business computing” is broadly defined to include work in business and industrial firms, government institutions, educational organizations, health-care facilities, and other production and service organizations using computers to do the operational and administrative work of the company.

- b) **Name and Position of the person who is responsible for administering the program:** Ben Martz, Chair, Business Informatics Department.
- c) **Any department committees charged with monitoring the program and description of their function with respect to the program:** College of Informatics curriculum committee oversees any changes to the curriculum before such changes are submitted to the University Curriculum committee. The department also seeks input from a standing advisory committee consisting of business professionals.
- d) **Brief Summary of previous reviews and reference to accreditation status from any professional organization**

The Association to Advance Collegiate Schools of Business (AACSB) accredits the BIS program. AACSB International accreditation represents the highest standard of achievement for business schools, worldwide. Institutions that earn accreditation confirm their commitment to quality and continuous improvement through a rigorous and comprehensive peer review. AACSB International accreditation is the hallmark of excellence in management education.¹

Although the program is NOT housed in the College of Business, the AACSB accreditation process allows for programs that are business related but not housed in a College of Business to receive such accreditation. The program

¹ Reproduced from the AACSB Website - <http://www.aacsb.edu/accreditation/>

went through a comprehensive reaccreditation review process and was along with the College of Business accredited during January 2007. There is a tri-party agreement among campus administration, the COB, and the COI, that recognizes the interdependence between the COB and the BIS department in satisfying several of the AACSB accreditation guidelines. NKU's "operationalizing" of this interdependence was evaluated and agreed to by the AACSB with the re-affirmation granted in 2007.

2. PROGRAM MISSION AND GOALS: PROGRAMS MISSION AND GOALS.

Program Mission:

The mission of the Business Informatics (BIS) undergraduate program is to provide an effective education for the student desirous of learning and applying information systems in a business context. To be considered effective, the department will deliver a quality curriculum, by recognized scholars in a proactive student-learning environment.

- a) Quality Curriculum: The BIS program provides a quality and current curriculum geared to creating information systems professionals. It follows AACSB standards for the business component and AIS standards for the information system component.
- b) Recognized Scholars: The BIS faculty collectively produces scholarly work (peer-reviewed and publicly accessible) in three areas: Learning and pedagogical scholarship, discipline-based scholarship, and scholarly contributions to practice. In the period from 2005-2007, the BIS faculty (7 faculty plus or minus 1 during that time) collectively produced 31 peer-reviewed journal articles and 44 conference proceedings or book chapters.
- c) Proactive Student Learning Environment: Faculty members are expected to create a broadly defined environment for student learning. In the narrowly defined teaching environment, faculty members should incorporate various teaching methods such as problem based learning, case study and teaching technologies. In the extended environment, they are expected to mentor students, keep in touch with alumni, recruit new students for the program, help in career placement of the existing students and participate in general college and university activities that further the development of the program.

3. RELATIONSHIP TO INSTITUTIONAL MISSION:

Learner-centered teaching:

The B.S. in Business Informatics was designed specifically to meet the needs of students whether matriculating at NKU or transferring into NKU. An assessment of

syllabi and other teaching materials occurs annually as part of the AACSB accreditation. These assessments are also considered during the annual faculty performance reviews and the reappointment, tenure and promotion process. Active and problem based learning is encouraged in all courses, and specifically required in many upper-division business courses. The department is moving to teach its classes in computer classrooms in an effort to provide graduates with a higher level of computer skills and information literacy.

Excellence

Students desiring to major in Business Informatics must meet selective admissions requirements for the Department of Business Informatics. Some of the selective admissions courses may fulfill requirements in several mandatory categories: general studies requirements, requirements for the major in information systems and requirements for the minor in business administration. The selective admissions requirements for the major in business informatics can be met by completing a list of 15 courses and maintaining a minimum grade-point average of 2.50 in 10 specific courses of those required.

Access with the opportunity to succeed

Because BIS classes fundamentally teach computer literacy and information systems, the BIS program maintains two computer labs for students. In these labs students have access to hardware, if they have none, and to the specialized software needed for their classes. In this way, the program guarantees the student the learning environment necessary to become successful.

In addition, cooperative education is an integral part of the curriculum. Although not mandatory, there is a departmental coordinator assigned to monitor the cooperative education component, who makes visits to companies where students do the internship not just to monitor their progress but to ensure that our curriculum meets the needs of the real world.

4. INSTRUCTIONAL EFFECTIVENESS:

AACSB prescribes each organization seeking their accreditation provide policies and procedures to demonstrate an assurance of learning. The AACSB leaves these policies and procedures to the discretion of the reviewed, but they must tie into the stated mission and goals of the organization; in this case the BIS department and the larger COB. The Spring 2006 versions of these documents are displayed in the attached Appendix A.

To summarize the BIS department process; we have established an ongoing data collection schedule that coordinates the BIS courses and learning goals with a measurement instrument. The instruments are deployed and data are collected and analyzed. The analyzed data are formatted and used to identify potential areas of change or enhancement.

4.a.1. The BIS program does not offer any general studies courses.

4. a.2. The program does offer service courses to other degree programs: The courses are: IFS 105, IFS 300, INF 186, INF 282, INF 284, and INF 286.

- ❖ INF 186 is a service class for the Media Informatics Program. It was offered for the first time in the Spring 2007 Semester.
- ❖ IFS 105 is a service course for the College of Education. It is a prerequisite of EDU 316. Completion of the IFS 105 course also satisfies the university's computer literacy requirement.
- ❖ Two service courses are provided for the College of Business, IFS 105 and IFS 300. IFS 105 is a prerequisite of ACC 200 and IFS 300. IFS 300 is part of the required Business Administration Minor for all Business students.
- ❖ Multiple sections of both classes are offered each semester, and they are offered day, night, and weekend every semester.
- ❖ Class offerings are determined based on previous enrollment history and projections of future needs.
- ❖ Three classes that are jointly used by both Computer Science and Business Informatics are offered each semester, INF 282, 284, and 286; Each of these classes is offered each semester

4. a.3 Strengths and weaknesses of the current curriculum

Strengths

- ❖ The curriculum follows the basic curriculum prescribed by the Association of Information Systems (AIS)
- ❖ The BIS curriculum meets the quality standards of AACSB
- ❖ The curriculum is pre-requisite based which provides a curriculum with a greater depth in the topic area
- ❖ The delivery of the curriculum is predominately done in computer supported classes
- ❖ Classes, in general, remain small: under 35 at the freshman and sophomore level and under 20 at the junior and senior level
- ❖ Software products are current and industry standard

Weaknesses

- ❖ The pre-requisite based curriculum does not allow for easy transition into the program by juniors and seniors.
- ❖ The need to teach classes in computer classrooms (rooms with computers for students) is straining resources.
- ❖ The curriculum must provide a broader set of electives.
- ❖ The BIS curriculum, in general, does not appeal to female students. Studies are planned to address this issue.

4. a.4 Role of technology in the delivery of the curriculum

The role of technology in the delivery of the curriculum grows. All classes are taught with the support of NKU smart classrooms (projector, computer console, basic software). Faculty members are moving more and more courses to have support with Blackboard providing asynchronous support for the class over the internet. There is a concerted push to have most if not all classes taught in computer classrooms (rooms where students have computers in front of them). This push is being hampered as the current supply of computer classrooms is not sufficient to keep up with demand.

4. a.5 **Co-ops and internships.** The department has an ongoing co-op program. Although it is not required for graduation, many students make use of the co-op program and gain valuable real-world experience. The co-op coordinator, Dave Manning, visits the co-op program companies not just to evaluate the current students in the program but also to maintain ongoing contacts with the co-op organizations. The table below provides the number of co-op students in recent years. Timing and seasonal issues in the marketplace generally cause the fluctuation in numbers. Traditionally the department has promoted the program and has been able to place any interested student in a coop position.

Semester	No of Coop Students
Fall 2003	6
Spring 2004	6
Summer 2004	7
Fall 2004	5
Spring 2005	14
Summer 2005	9
Fall 2005	10
Spring 2006	10
Summer 2006	3
Fall 2006	6

4. B. Enrollment

There is both good news and bad news in the enrollment numbers. First, the number of declared majors is down. While this is consistent with national trends for business informatics type (information systems, management information systems, etc.), this trend was probably accentuated with our move out of the College of Business where we traditionally recruited those students interested in business and computers. The national trend has the demand for these programs leveling off. We anticipate the BIS program to follow that trend.

On the positive side, the total enrollments in BIS classes grew 10% from 04-05 to 05-06 and is stable from 05-06 to 06-07. We believe that the program is positioned to reclaim some of its luster given;

- ❖ the name change to Business Informatics;
- ❖ the completion of the transition to the College of Informatics
- ❖ the curriculum changes to allow/promote electives
- ❖ more attention to computer-based classroom instruction

BIS Enrolled Majors & Enrollments								
	Fall 2004	Spring 2005	Summer 2005	Fall 2005	Spring 2006	Summer 2006	Fall 2006	Spring 2007
Majors								
UG Total	205	177	79	156	170	60	141	124
Graduate	51	39	20	35	21	4	23	34
TOTAL	256	216	99	191	191	64	164	158
Enrollments								
By Semester	826	994	221	988	1019	240	999	1009
By year	2041			2247				

Undergraduate Enrollment

	2002	2003	2004	2005	2006
Graduates	63	46	33	41	
Enrolled Majors	107	85	62	58	36
Enrolled Pre-Majors	254	185	143	98	66

Service Courses	2002	2003	2004	2005	2006
IFS 105	1005	1049	894	931	906
IFS 300	0	42	165	228	286
INF 186	0	0	0	0	24
INF 282	0	0	0	0	65
INF 284	0	0	0	0	66
INF 286	0	0	0	0	64
Service classes also reflect All Semester Enrollments					

4C. Faculty

The AACSB requires an annual self-study report by its members. The self study includes the recording and tabulation of the department’s qualifications and intellectual contributions to assure academic currency in the field (Table 2); faculty sufficiency to assure the faculty resources are available to the program (Table 1C); and, the deployment of faculty (Table 2c) to assure that the program applies the resources in a manner adequate to deliver a quality program. Each metric has a threshold level; the BIS met these levels.

Fall 2006 – Information Systems
Table 1C Summary of Faculty Sufficiency in Discipline and School
(Re: Standard 9 – Using Courses)

Name	Participating or Supporting (P or S)	Amt. of Teaching if P (blank if S)	Amount of teaching if S (blank if P)
Information Systems			
Bledsoe, M.	P	4	
Braun, F. **	P	3	
Cata, T.	P	3	
Duggal, S.	P	3	
Manning, D. **	P	3	
Martz, B *	P	1	
Raghavan, V.	P	3	
Sakaguchi, T.	P	3	
Scott, G.	P	4	
Zhang, X.	P	3	
Braun, T.	S		1
Simpson, R.	S		1
Gonnella	P	1	
Downing	S		1
Burk	S		1
Total		31	4
		$\frac{31}{31+4} = 88\%$	
Std. 9: $\frac{P}{P+S} > 60\%$			

* Department Chair

** Other Admin Duties

Fall 2006 – Department of Information Systems
TABLE II: SUMMARY OF FACULTY QUALIFICATION, INTELLECTUAL CONTRIBUTIONS
AND PROFESSIONAL RESPONSIBILITIES
(RE: Standards 2, 9, & 10)¹

Name ²	Highest Earned Degree & Year	Date of First Appt. to School	Percent of Time Dedicated to School's Mission ³	Acad Qual ⁴	Prof Qual ⁴	Other ⁴	Number of Contributions during the last five years						Normal Professional Responsibilities ⁶
							Learning & Pedagogical Scholarship ⁵		Discipline-Based Scholarship ⁵		Contributions to Practice ⁵		
							PRJ	OIC	PRJ	OIC	PRJ	OIC	
INFORMATION SYSTEMS													
Bledsoe, M.	EdD '99	2002	1.00		Yes							2	UG SER
Braun, F.	MBA '86	2000	1.00		Yes				1				UG/GR, SER
Braun, T.	MSIS '03	2004	.25		Yes								UG
Burk, A.	MBA '75	1995	.25		Yes								UG
Cata, T.	PhD '03	2003	1.00	Yes				3	7 ²		1 ¹		UG/GR, RES, SER
Duggal, S.	EdD '86	1979	1.00	Yes			2		12				UG/GR, RES, SER
Gonnella, J.	MBA '85	1995	1.00		Yes								
Manning, D.	Med '84	1984	1.00		Yes								UG, SER
Martz, B.	PhD '89	2006	1.00	Yes			2	6	17	1		9	ADM, UG/GR, RES, SER
Raghavan, V.	PhD '90	1987	1.00	Yes				1		6 ²		1 ¹	UG/GR, RES, SER
Sakaguchi, T.	PhD '99	1999	1.00	Yes					2		5 ⁴		UG/GR, RES, SER
Scott, G.	ABD	1976	1.00			Yes							ADM, UG, SER
Simpson, R.	MSIS '03	2006	.25		Yes								UG
Downing, M.	MSIS '02	2005	.25		Yes								UG
Zhang, X.	PhD '01	2001	1.00	Yes					8	12	2	3	UG/GR, RES, SER
Total							2	9	32¹	53¹²	2	16²	

Superscript number indicates number of publications co-authored with at least one NKU faculty member.

Fall 2006 - Department Of Information Systems
TABLE IIA: CALCULATIONS RELATIVE TO DEPLOYMENT OF QUALIFIED FACULTY
(RE: Standard 10)¹

NAME	QUALIFICATION (ACADEMIC-AQ PROFESSIONAL- PQ OTHER-O) (FROM TABLE II)	AQ faculty- % of time Devoted To Mission (FROM TABLE II)	PQ faculty- % of time devoted to mission (FROM TABLE II)	OTHER ² faculty- % of time devoted to mission (FROM TABLE II)	QUALIFICATION RATIOS PER STD 10
Information Systems					
Bledsoe, M.	PQ		1.00		
Braun, F.	PQ		1.00		
Braun, T.	PQ		0.25		
Burk, A.	PQ		0.25		
Cata, T.	AQ	1.00			
Duggal, S.	AQ	1.00			
Gonnella, J.	PQ		1.00		
Manning, D.	PQ		1.00		
Martz, B.	AQ	1.00			
Raghavan, V.	AQ	1.00			
Sakaguchi, T.	AQ	1.00			
Scott, G.	O			1.00	
Simpson, R.	PQ		0.25		
Downing, M	PQ		0.25		
Zhang, X.	AQ	1.00			
TOTAL INFORMATION SYSTEMS		6.00	5.00	1.00	$AQ_A / (PQ_A + AQ_A + O_A) \geq 50\%$ $6.0 / (6.0 + 5.0 + 1.0) = 50. \%$ $(AQ_A + PQ_A) / (AQ_A + PQ_A + O_A) \geq 90\%$ $(6.0 + 5.0) / (6.0 + 5.0 + 1.00) = 91\%$

Please see Appendix E for a detailed listing of all faculty scholarly productivity.

D. Learning Outcomes

The course syllabi act as the “learning contract” between the student and the program. These syllabi include the specific course goals, learning objectives, and grading measures for the courses. These are provided to students each semester.

As part of the AACSB accreditation process, the program identifies and tracks learning assessment objectives. The table provided below summarizes the recent results (Spring 2006) of assurance of learning evaluation. Column 1 in the table refers to the following goals described in section 2.

1. Demonstrate strong analytical skills and technological expertise in developing business systems.
2. Apply theoretical information systems concepts in real world.
3. Evaluate and adopt new technology.
4. Work effectively in diverse project teams.

For detailed evaluation methods including all exhibits see Appendix A.

AACSB ASSURANCE OF LEARNING
Spring 2006
Undergraduate BSIS Program

Learning Goal	Class	Instructor	Date Due	Measurement Instrument	Note
1	IFS 402	Zhang	May 15, 2006	Exhibit A	
1	IFS 410	Sakaguchi	May 15, 2006	Exhibit B	69% Exceeded expectations. 25% met expectations; 5% did not meet expectations.
1	IFS 435	Raghavan	May 15, 2006	Exhibit C	61 %Exceeded Expectations; 20% met expectations; 19% did not meet expectations – Note did not meet expectations was defined as less than 80% of the total points available.
2	IFS 330	Braun	May 15, 2006	Exhibit D	
2	IFS 330	Braun	May 15, 2006	Exhibit E	
3	IFS 310	Sakaguchi	June 15, 2006	Exhibit F	Class cancelled during spring semester/ Do in Summer
3	IFS 310	Sakaguchi	June 15, 2006	Exhibit G	Class cancelled during spring semester/ Do in Summer
4	IFS 410	Sakaguchi	May 15, 2006	Exhibit H	75% Exceeded expectations 13% met expectations; 13% did not meet expectations.
4	IFS 410	Sakaguchi	May 15, 2006	Exhibit I	100% Exceeded expectations.
5	IFS 300	Braun T/Cata	May 15, 2006	Exhibit J	
5	IFS 485	Mahaney R	May 15, 2006	Exhibit K	77.7% of the students met expectation. 22.3% did not meet expectations

5. SCHOLARSHIP

The Department of Business Informatics follows the scholarship standards set forth in the College of Business documents as the department meets the standards for AACSB accreditation. The department encourages and rewards scholarship in formal policies covering 1) Active Scholar status, 2) Performance Review, 3) Retention, Promotion and Tenure and 4) Graduate Faculty status.

Intellectual contributions include the following, all of which must meet the standards that they are publicly available and of good quality:

- ❖ peer reviewed, academic, pedagogical or professional journal articles that is publicly available and of good quality
- ❖ research monographs
- ❖ scholarly (professional) books
- ❖ chapters in scholarly (professional) books
- ❖ textbooks
- ❖ regional, national or international proceedings from scholarly meetings
- ❖ publications in trade journals
- ❖ written cases with instructional materials
- ❖ papers presented at academic or professional meetings
- ❖ instructional software
- ❖ other publicly available materials describing the design and implementation of new curricula or courses
- ❖ obtaining new professional certification
- ❖ faculty internship
- ❖ major editorial responsibilities such as editor-in-chief or executive editor of a journal/practitioner periodical
- ❖ other (with documentation)

In the period from 2005-2007, the BIS faculty (7 faculty plus or minus 1 during that time) collectively produced 31 peer-reviewed journal articles and 44 conference proceedings or book chapters. The entire faculty listed as graduate faculty meets the standards of two peer-reviewed journal publications in the past two years. Please see Appendix E for a detailed scholarly productivity for the past two years for all graduate faculty members.

6. CIVIC ENGAGEMENT

The department contributes to all university wide initiatives of civic engagement. It has an excellent record of participating in all such civic engagement opportunities. In addition, it also sponsors initiatives on its own.

For example, the department sponsors a summer camp for middle school students where they were trained in introductory computer and web development skills. This has been an ongoing program for the past four years that has provided significant exposure to prospective future students and outside stakeholders.

The BIS courses themselves provide opportunities for civic engagement activities. For example, in the graduate MBI program, we have established and project with St. Claire Medical Center using our graduate project management class. The class is performing an information security audit for the medical center. More of these types of projects are anticipated as skills such as project management and web design can be used as both outreach and class projects.

7. Student Involvement and Satisfaction

Students with a major in BIS may join the following student organizations, all of which have faculty advisors:

- American Marketing Association
- Economics Club
- Finance Student Association
- NKU Chapter of the Institute of Management Accountants
- NKU Finance Student Association
- NKU Sports Business Club
- Phi Beta Lambda

The activities of these student organizations usually include regular meetings, outside speakers, and field trips. Phi Beta Lambda participates in regional and national business competitions with great success.

Each department within the College of Informatics has professional, full-time, year-round advisor/lecturers available for appointments, walk-in, and electronic advising and career counseling sessions. While the advisors may cross-advise, the department specialist provides students a coherent and consistent advising experience. The college-wide advising and recruiting activities are coordinated through the college's Assistant Dean position. These activities include but are not limited to; staffing Northern Exposure, Black and Gold days, major/minor fair and other recruitment activities.

Historically as part of the COB, the BIS department had received student Senior Surveys to help coordinate advising.

8. Information Resources and Instructional Equipment

The library holdings are currently adequate for the program. The new Masters in Health Informatics will require continued investments to improve our library holdings. The department is beginning to incorporate SAP into its curriculum. Faculty members who are involved in teaching in this new area have attended training classes through NKU funding Continued investments for faculty development (training and education) in these two areas (SAP and Health Informatics) receive high priority from the department.

The faculty and administrative staff have currently adequate computer resources. However, NKU's policy change away from a three-year replacement cycle for computer equipment may prove problematic. Some of the software licenses currently used in classrooms, labs, and faculty offices require annual renewal. Most years these expenses are funded by Learning Software Advisory Committee (LSAC), yet it is not guaranteed and under annual reviews.

BIS faculty needs ongoing investments in hardware and software to embrace new technologies and keep the program current. Also, faculty may want to use innovative equipment and software such as tablet PCs and new application software. Other peripheral equipment such as printers may need to be updated regularly. Yet there is no guaranteed stream of revenue for such support.

The department maintains two labs: ST 242 and ST 211. While the computers fall under the campus replacement policy, the department receives none of the funds collected by the campus for student lab tech fees. The department must fund the lab's operating supplies such as paper and toner cartridges from its departmental budget. This drains limited departmental resources that should be used for faculty development, curriculum enhancement or outreach opportunities. This situation is being exaggerated in 2007-2008 as the department is adding four new positions (three in BIS and one in MHI). This growth requires a corresponding growth in operating budget.

Related to equipment and facilities is the issue of support staff. The equipment in classrooms, labs, and offices are maintained and updated regularly by Office of IT staff. Licenses check and beginning-of-semester reimaging of software are scheduled adequately. However, due to specialty in the field of study, emergency needs for services and change in software in classrooms and labs require closer attention and dedicated personnel. During the creation of College of Informatics and along with the move of department from BEP building to AST building, lab assistant personnel for the college is promised by administration but not realized.

Business Informatics classes are better classes when students have hands-on computer interaction. The department has two smart classrooms (BEP 304 and AST 110) where it can currently schedule classes. These classrooms are scheduled more than 60% of the time and are scheduled 100% after noon through 9:00 pm Monday through Thursday and 9:00 A.M. through 3:00 P.M. on Saturdays. Additional computer classrooms are required,

as the need for classrooms will grow significantly with the creation of SAP classes and the MHI major.

The department/college also needs additional resources for conference room to schedule college meetings and research seminars. The conference room available for this purpose (ST 368) needs to be furnished as soon as possible.

9. Program Benchmarking

The BIS Department was benchmarked as part of COB. As such the benchmarking section of their report, extracted below, seems appropriate.

As required by AACSB, in April 2003 the College of Business initiated a process to select peer, aspirant and competitive institutions. The Executive Committee identified nine selection criteria to be considered: 1) mission; 2) degree programs in business; 3) number of students; 4) institutional affiliation (public, private, religious and urban/rural/suburban); 5) number of full-time faculty; 6) faculty workload; 7) business operating budget; endowment; 8) Carnegie classification; and 9) average ACT/SAT of freshmen. Based on their knowledge of other schools, faculty, administrators and advisory board members were then asked to suggest potential peer schools. Twenty-two potential peer and aspirant schools were identified (three in Kentucky and two in the greater Cincinnati region) and potential competitive schools also were identified, but were not asked to provide criteria. Letters were then sent to the business deans of the twenty-two schools asking them to provide information on the selected criteria. Once the data was received and summarized, the Executive Committee, Advisory Board and NKU President James Votruba reviewed it and agreement was reached on the following peer and aspirant institutions, which were accepted by AACSB:

Comparable:

- Eastern Kentucky University
- Western Kentucky University
- Marshall University
- Youngstown State University
- Southern Indiana University
- California State University – Fresno
- California State University – Bakersfield
- Wichita State University
- Portland State University

Aspirant:

- University North Carolina – Charlotte
- Middle Tennessee State University
- Wright State University
- University of Toledo
- Ball State University
- University of Alabama - Birmingham

Miami University

Competitive:

University of Cincinnati
Xavier University
University of Kentucky
University of Louisville

NKU contributes annually to the AACSB database, and in return receives routine aggregate data from peer and aspirant schools.

a. Comparison to peer institutions from 2005 data:

- ❖ The College of Business is very efficient—the total student enrollment is second largest of the peer schools while the total operating budget is below average
- ❖ Operating funds per enrolled student (\$2426) is only about half the average (\$4989) of the peer schools
- ❖ The College of Business uses the largest number of part-time faculty
- ❖ The College of Business utilizes the highest percentage of its operating budget for instructional activity
- ❖ The quality of undergraduate students as measured by SAT and ACT scores compares favorably with those at the peer schools
- ❖ NKU has smaller class sizes (29.6) than the average of the peer schools (33.5)

10. External Evaluators

The B.S. in Business Informatics is an AACSB accredited degree program; accreditation was affirmed in January 2007.

The BIS Department has in place an active and interested advisory board. The board is made up of local business professional and alumni. The goal is to have our faculty meet with them each year to discuss the curriculum, the current information field, and possible partnerships between the BIS department and their organizations. A key activity performed by this group is the critique provided of the curriculum or possible curriculum changes. The final decision on curriculum rests with department, but the external input is valued heavily.

In September 2006, the BIS faculty met with the advisory board. The main curriculum issues discussed included reactions to four initiatives; project management, quantitative analysis, co-ops, ERP with SAP, and Health Informatics. In addition, the BIS department asked for the advisory board to provide feedback on the overall program curriculum by evaluating the courses in the curriculum. An electronic meeting system was used to capture the input; the results are listed in Appendix B through appendix D.

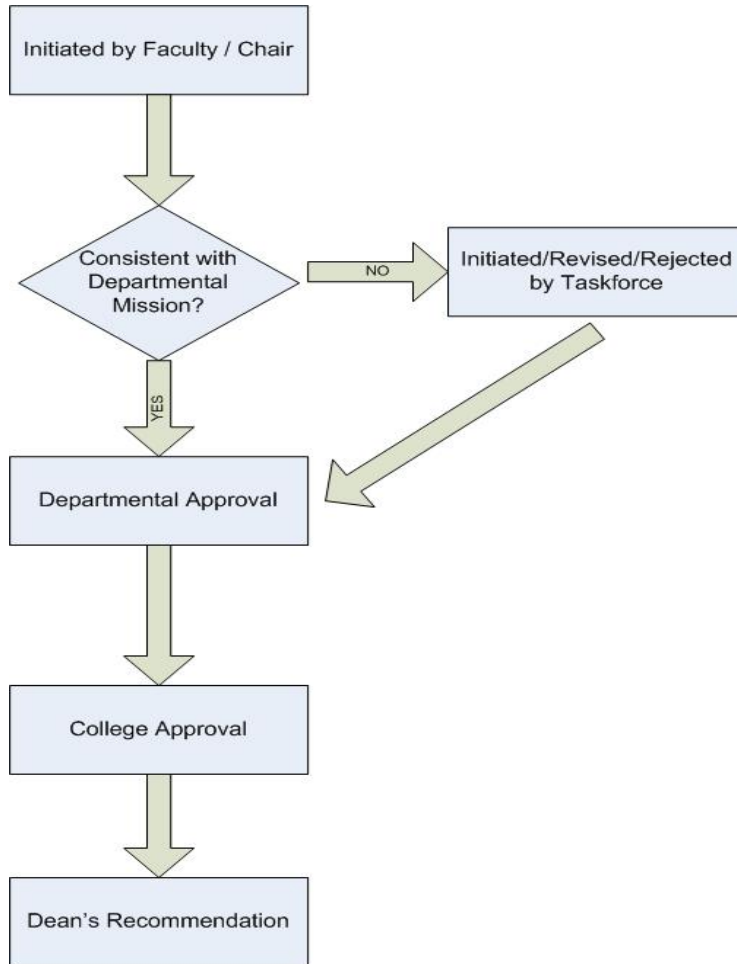
To summarize the results; the project management, quantitative analysis, co-ops, ERP-SAP, and Health Informatics were positively received. Both project management and quantitative analysis were identified as skills whose needs are on the rise in the industry. Co-ops were identified and a key component to grow in the program to help students receive real-world experience. In the two major initiatives, ERP-SAP and Health Informatics, the feedback was positive but also carried a level of concern for a possible over commitment of resources.

The input collected on general skills important for the students and on the reaction to particular courses provided the faculty a prioritized list of skills and courses, respectively. From the results, one finds the advisory board emphasizing broad based skills (problem solving, critical thinking, team skills, written and oral communication) and pointing to courses such as project management, data base, knowledge management as key. These perceptions give additional guidance for the faculty as we evaluate our program.

11. Program Planning

Curricular improvements are discussed within the department. The Departmental advisory committee offers inputs on various aspects of the curriculum. An Example of how the departmental business advisory committee provides curricular improvement suggestions is detailed in Appendix B through Appendix D. The department regularly meets every alternate week (typically a Friday) to discuss all departmental affairs including program and course planning. The flowchart below depicts the program planning decision processes.

DEPARTMENTAL PROGRAM PLANNING PROCESS



APPENDIX A

AACSB ASSURANCE OF LEARNING Assurance of Learning

IFS UNDERGRADUATE PROGRAM

Goals	What it means – measurable objective	Measurement Method – Timing and Where	Instrument	What is Satisfactory Performance	Outcome of Analysis	Program Follow-up
1. Demonstrate strong analytical skills and technological expertise in developing business systems.	<ul style="list-style-type: none"> ▪ Demonstrate sound programming knowledge & skills (1) ▪ Effectively apply database design concepts (2) 	<ul style="list-style-type: none"> ▪ Embedded test questions in IFS 402 will be used for (1) ▪ Embedded test questions in IFS 410 will be used for (1) ▪ All students in IFS 435 will be assessed (2) 	<p>Exhibit A</p> <p>Exhibit B</p> <p>Exhibit C</p>	Does not meet expectation: Average score less than 70% across all students for each sub-question; Meets Expectations: Average score of 70%; and Vastly Exceeded Expectations if this score is 85% or better.		
2. Apply theoretical information systems concepts in real world.	<ul style="list-style-type: none"> ▪ Demonstrate practical application of IT project management concepts. ▪ Demonstrate practical 	<ul style="list-style-type: none"> ▪ Embedded test questions will be used in IFS 330 and all students will be assessed. ▪ IT Project Management Case Study 	<p>Exhibit D</p> <p>Exhibit E</p>	Does not meet expectation: Average score less than 70% across all students for each sub-question; Meets Expectations: Average score of 70%; and Vastly Exceeded Expectations if this score is 85% or better.		

	application of IT project management concepts. <ul style="list-style-type: none"> ▪ 					
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Goals	What it means – measurable objective	Measurement Method – Timing and Where	Instrument	What is Satisfactory Performance	Outcome of Analysis	Program Follow-up
3. Evaluate and adopt new technology.	<ul style="list-style-type: none"> ▪ Demonstrate skills identifying and comparing software alternatives. ▪ Demonstrate skills on understanding tangible and intangible benefits of the new system and the feasibility of the process. 	<ul style="list-style-type: none"> ▪ Assessed in group project in IFS 310 involving both written report and presentation. ▪ Assessment is by instructor. ▪ All students in IFS 310 will be assessed. 	Exhibit F Exhibit G	Does not meet expectation: Average score less than 70% across all students for each sub-question; Meets Expectations: Average score of 70%; and Vastly Exceeded Expectations if this score is 85% or better.		
4. Work effectively in diverse project teams.	<ul style="list-style-type: none"> ▪ Demonstrate understanding of concepts pertaining to individual and team accountability. ▪ Demonstrate understanding of JAD and roll of users in systems development. 	<ul style="list-style-type: none"> ▪ Embedded questions will be used in IFS 410 and all students will be assessed. 	Exhibit H Exhibit I	Does not meet expectation: Average score less than 70% across all students for each sub-question; Meets Expectations: Average score of 70%; and Vastly Exceeded Expectations if this score is 85% or better.		

Assurance of Learning Program – IFS Undergraduate Continued

Exhibit A

1. _____ are private, internal systems to help carry out the day-to-day information processing, management information, and work-flow activities of organizations.
 - a. Intranets
 - b. Internets
 - c. Extranets
2. Which of the following is correct?
 - a. <% Page Language="vb" Debug="True" %>
 - b. <% @ Page Language="vb" Debug="True" @%>
 - c. <% @ Page Language="vb" Debug="True" %>
 - d. <@% Page Language="vb" Debug="True" %>
3. Which of the following syntax is correct?
 - a. <% @ Namespace="System.Data.OleDb" %>
 - b. <% @ Import Namespace="System.Data.OleDb" %>
 - c. <% @ Import Name="System.Data.OleDb" %>
 - d. <% @ Import Namespace="Data.OleDb" %>
 - e. <% @ Import Space="System.Data.OleDb" %>
4. Which is the correct syntax for including the ASP.NET Write() method inside an element?
 - a. <% Write("Hello World"); %>
 - b. <%= Write("Hello World"); %>
 - c. <% Response.Write("Hello World"); %>
 - d. <%= Response.Write("Hello World"); %>
5. Which the following syntax is correct?
 - a. Dim DBConnection = New OleDbConnection & _
("Provider=Microsoft.Jet.OLEDB.4.0, Data Source=eCommerce.mdb")
 - b. Dim DBConnection = New OleDbConnection _ &
("Provider=Microsoft.Jet.OLEDB.4.0; Data Source=eCommerce.mdb")
 - c. Dim DBConnection = New OleDbConnection _
("Provider=Microsoft.Jet.OLEDB.4.0; Data Source=eCommerce.mdb")
 - d. Dim DBConnection = New OleDbConnection _
("Provider=Microsoft.Jet.OLEDB.4.0, Data Source=eCommerce.mdb")
6. _____ displays database table information within a row and column grid.
 - a. <asp:Label/>
 - b. <asp:GridView/>
 - c. <asp:AccessDataSource/>
 - d. <asp:Button/>
7. Which of the following helps you locate survey.aspx on the server?
 - a. Server.Path("survey. aspx ")
 - b. Server.Find("survey. aspx ")
 - c. Server.Locate("survey. aspx ")
 - d. Server.MapPath("survey. aspx ")

Exhibit B
Assurance of Learning – Undergraduate IFS Program

Goal #1: Demonstrate strong analytical skills and technological expertise in developing business systems.

- Demonstrate sound programming knowledge & skills
- Embedded test questions in IFS 410
Question: Write a main method to accept an input x in double value with JOptionPane, round x to the nearest integer, and produce output in JOptionPane. Use the function $y = (\text{int}) \text{Math.floor}(x + .5)$ to round the double number into integer.
- **What is satisfactory performance?**
 1. Answers are to be graded on the bases for completeness of the program. Students are expected to do the following:
 - a. Format the program to run
 - b. Perform the function as specified
 2. All students are expected to answer both points. A few minor errors may be permissible.

Exhibit C PROJECT CASE

Project Description

As a large service organization, Mountain View Community Hospital depends on a large number of persons for its continued success. There are four groups of persons on whom the hospital is most dependent: employee, physicians, patients, and volunteers. Of course some attributes are shared by all of these persons: **Person_ID (identifier), Name, Address, City/State/Zip, Birth_Date, and Phone.**

Each of the four groups of persons has a least one unique attribute of its own. Employees has a **Date-Hired**, **Volunteers has a Skill**, **Physicians have a Specialty and a Pager# (pager number)**, and **Patients have a Contact_Date (date of first contact with the hospital)**. Some other persons in the hospital community do not belong to one of these four groups (their numbers are relatively small). However, a particular person may belong to two (or more of these groups at a given time (e.g., **Patient and Volunteer**)).

Each patient has one (and only one) physician responsible for that patient. A given physician may not be responsible for a patient at a given time, or may be responsible for one or more patients. Patients are divided up into two groups: residents and outpatients. Each resident patient has a **Date_Admitted** attribute. Each outpatient is scheduled for zero or more visits. The entity visit has two attributes: **Date (partial identifier) and Comments**. Notice that an instance of visit cannot exist without an outpatient owner entity.

Employees are subdivided into three groups: **nurse, staff, and technician**. Only nurse has the attribute **Certificate, which indicates the qualification (RN, LPN, etc.)**. Only staff has the attribute **Job_Class**, and only technician has the attribute **Skill**. Each nurse is assigned to one (and only one) care center. Examples of care centers are Maternity, Emergency, and Cardiology. Attributes of care center are **Name (identifier) and Location**. A care center may have one or more nurses assigned to it. Also, for each care center, one of the nurses assigned to that care center is appointed **nurse_in_charge**. A nurse cannot be appointed **nurse_in_charge** of a care center unless she or he had an **RN certificate**. Each technician is assigned to one or more laboratories. Attributes of laboratory include **Name (identifier) and Location**. A laboratory must have at least one technician assigned to it and may have any number of technicians assigned.

There may be no beds assigned to a care center, or a care center may have one or more beds (up to any number) assigned to it. The only attribute of bed is **Bed_ID (identifier)**. **Bed_ID** is a composite attribute, with components **Bed# and Room#**. Each resident patient must be assigned to a bed. A bed may or may not have a resident assigned to it at a given time.

Question:

1. Draw each relationship as a separate ER diagram. Mark clearly your participation and cardinality constraints. Write Four lines for each ER diagram. Look for strong/weak entities and superclass/subclass relationships.
2. Combine all the entities into one Enterprise ER model.

Exhibit D

IFS 330 IT Project Risk Management Exam Questions

- 1) The Project Management Body of Knowledge (PMBPK) that defines the process of risk management includes all of the following except
- a) Risk Management Planning
 - b) Risk Identification
 - c) Qualitative Risk Analysis
 - d) IT project Risk Impact Analysis
 - e) Risk Response Planning

Answer: D

- 2) Identifying what you know, what you think you know and things you need to find out would be activities most closely associated with:
- a) Learning Cycles
 - b) Brainstorming
 - c) Nominal Group Technique
 - d) Delphi Technique
 - e) Cause and Effect Diagrams

Answer: A

- 3) A structured technique for identifying risks which requires participants to rank and prioritize ideas in round-robin fashion is most closely associated with:
- a) Learning Cycles
 - b) Brainstorming
 - c) Normal Group Technique
 - d) Delphi Technique
 - e) Cause and Effect Diagrams

Answer: C

- 4) In which step of the risk planning process does the text say one might decide to transfer project risk to someone else (i.e. use insurance)?
- a) risk planning
 - b) risk identification
 - c) risk assessment
 - d) risk strategies
 - e) risk monitoring and control

Answer: A

- 5) Receiving a much larger than usual gas utility bill because of an early spring cold spell is an example of what type of risk?
- a) known risk
 - b) known-unknown risk
 - c) unknown-unknown risk
 - d) known-known
 - e) none of the above

Answer: B

Exhibit E

IFS 330 – IT Project Management Text Companion Website Case Study Husky Air

Husky Air is a fictitious company that will provide a background for your group assignments. The navigation buttons on the website provide information about the company, its services and products, the team assignments, and several general aviation links to give you some information about the industry.

Take a look at the different areas within the company (E.g., Charter, Rentals, Instruction, Pilot Angels, Services and Supplies). Your instructor will either assign one of the case areas or let you choose your own. Over the semester, you and your team will work together on a series of assignments as a consulting team hired by Husky air. These assignments will integrate much of the material in the textbook, Information Technology Management: Providing Measurable Organizational Value. In addition, you will work on a number of information technology project deliverables very similar to real-life IT project team.

There are several areas of sub-cases that can be used as a background for completing a series of assignments over the course of the semester. The instructor will assign one of these sub-cases to each group, or the students can decide which area of the company is most interesting to them. The sub-cases include:

- Corporate Charters
- Rentals
- Instruction
- Pilot Angels
- Service
- Pilot Supplies

In addition, a number of aviation-related links provide additional information about this industry.

Currently, there are 11 assignments that can be used with any of the sub-cases. The assignments the corresponding chapters include:

- Assignment 1 – The Team Charter (Chapter 1)
- Assignment 2 - The Business Case (Chapter 2)
- Assignment 3 - Defining the Project Infrastructure – The Project Charter (Chapters 3 & 4)
- Assignment 4 - The Scope Management Plan (Chapter 5)
- Assignment 5 - The work Breakdown Structure (Chapter 6)
- Assignment 6 - The Project Schedule and Budget (Chapter 7)

- Assignment 7 - The Risk Management Plan (Chapter 8)
- Assignment 8 - Tracking and Reporting (Chapter 9)
- Assignment 9 - The Quality Management Plan (Chapter 10)
- Assignment 10- The Change Management Plan (Chapter 11)
- Assignment 11- The Implementation and Project Closure Plan (Chapter 12)

The assignments were designed to be completed in teams. Instructors can assign students to teams or have the students select their own members. Experience with this case in the past suggests that small teams of 3 or 4 students are optimal. The case and assignments allow the students to play the role of consultants who have been hired by Husky Air to plan the development of information systems to support one of the sub-cases or areas within the company. The assignments require that the students provide a series of project deliverables throughout the project life cycle.

Exhibit F
Assurance of Learning – Undergraduate IFS Program

Goal #3: Evaluate and adopt new technology.

- Demonstrate skills identifying and comparing software alternatives.
- Assessed in group project involving a written report in IFS 310
 - Analyze Alternatives (Configuration Phase)
 - a) Specify the alternative solutions for the new system (brief description of each candidate) - Candidate Matrix
 - b) Analyze each alternative for Technical feasibility, Operational feasibility, Economic feasibility (Cost-Benefit -Payback/NPV analysis), and Schedule Feasibility - Feasibility Matrix
 - c) Propose a solution and justify
- **What is satisfactory performance?**
 1. Answers are to be graded on the bases for completeness of the project.
Groups are expected to do the following:
 - a. Create candidate matrix explaining alternative solutions
 - b. Analyze feasibility of each alternative solution
 - c. Systematically evaluate alternative solutions and recommend the best solution
 2. All groups are expected to do all points. A few minor errors may be permissible.

Exhibit G
Assurance of Learning – Undergraduate IFS Program

Goal #3: Evaluate and adopt new technology.

- Demonstrate skills on understanding tangible and intangible benefits of the new system and the feasibility of the process
- Embedded test questions in IFS 310
 1. One of the tangible benefits is:
 - a. enhancing accuracy of information.
 - b. decreasing the time of processing.
 - c. maintaining a good business image.
 - d. improving the decision-making process.
 2. Intangible benefits include:
 - a. access to otherwise inaccessible information.
 - b. decreasing the time of processing information than was possible before.
 - c. decreasing the amount of employee time needed to complete specific tasks.
 - d. enhancing accuracy of information.
 3. When the project is expensive relative to the size of the company, which analysis should be used?
 - a. Break-even
 - b. Payback
 - c. Present value
 - d. Cash-flow
 4. The process of measuring how beneficial the development of an information system will be is called:
 - a. economic feasibility
 - b. operational feasibility
 - c. cost-benefit analysis
 - d. feasibility analysis
 5. Use ____ if the project needs to be justified in terms of cost, not benefits.
 - a. present value
 - b. net present value
 - c. cash flow
 - d. break-even

Exhibit H
Assurance of Learning – Undergraduate IFS Program

Goal #4 Work effectively in diverse project teams

- Demonstrate understanding of concepts pertaining to team accountability
- Final Exam (written – short answer question) – IFS410
Question: Discuss advantages and disadvantages of developing a system with a team of professionals. What did you learn from your teammates? What would be the key to the success for a project with a variety of backgrounds possessed by the team members?
- What is satisfactory performance?
 1. Answers are to be graded on the bases for awareness of issues involved.

Students are expected to discuss following:

- a. Advantages of team work (shared knowledge, synergy, etc.)
 - b. Disadvantages of team work (group thinking, unfavorable disagreement, etc.)
 - c. Importance of communication, leadership, understanding different opinions, etc.
2. All of students are expected to answer all points. A few minor errors may be permissible.

Exhibit I

Goal #4 Work effectively in diverse project teams

- Demonstrate understanding of JAD and roll of users in systems development
- Final Exam (written – short answer question) – IFS410
Question: Discuss JAD and JAD sessions. Include advantages and disadvantages of JAD, important issues and do's and don'ts in the JAD sessions.
- What is satisfactory performance?
 1. Answers are to be graded on the bases for awareness of issues involved. Students are expected to discuss following:
 - a. Advantages of JAD (fast feedback from users, expectation control, etc.)
 - b. Disadvantages of JAD (scheduling, unspoken expectations, etc.)
 - c. Importance of communication, leadership, etc.
 2. All students are expected to answer all points. A few minor errors may be permissible.

APPENDIX B

Business Informatics Advisory Board

September 15th, 2006

Opportunity Finding (Topic Commenter)

(Results are edited to show only the curriculum issues are shown for the SACS Program Review report)

4. Co-ops

Real life experience critical to understanding BIS

It is a critical offering for student retention.

Need more coop jobs offered by companies.

An extremely valuable program, in my opinion more important and valuable than any curriculum item. It allows students to get real world experience where they can learn the lingo of business as well as understand the balance between theory and practice. I would almost like to see this be mandatory.

Great program / real world experience.

Outsourcing having negative impact on entry level positions.

NKU should regularly promote to companies the co-op option.

this should be required for all undergrads

Very essential part for being part of understanding the theory imparted in classrooms with the real world business environment.

I can not speak highly enough as to the importance of this program. Over the years NKU has consistently produced top notch candidates.

This is very important step!

5. Initiative - Health Informatics

Partnerships with local healthcare providers?

Partnerships with healthcare administration (ex. UHC)?

A health informatics program within the Department of Business Informatics could draw upon the resources already within the department, thus compensating for currently low enrollments, etc.

Is there an agreement on what it is? What are the job functions of graduates of this program

May help drive HIPAA standardization of requirements

Will drive school's reputation

6. Initiative - Project Management

Growing more important for BIS success

Outsourcing may need to be addressed separately in a course

this should be a track with advanced options and this should enable PMP prep - We also need a Masters level degree in this region

This seems to be an interesting initiative since the current IT environment is changing so much.

Increasingly important. Align to PMI standards.

When PMs apply for a position, one of the interview questions generally is if they have been certified. Beyond the PM course, can NKU also assist those that are interested in becoming certified. I'm aware that George Washington University has one such program.

Need team building skills

What is the thought of adding ITIL to the Management environment in the Graduate program ??

7. Initiative - Quantitative Analysis

Very relevant and I see the introduction of Excel as an analysis tool. It is funny that Excel is the most common analysis tool used in business and majority of the people only use 10% of the capabilities. This tool should help in better decision making.

Excel can do lot more than simply add? are we teaching these other things

something around six sigma or integration with operations research could be considered - maybe a minor from another dept could address this need.

Very relative to customer determining requirements

8. Initiative - ERP/SAP

ERP should be a 3 course track that would lead to competency - another consideration should be APICS certification

do we have the resources?

10. Alumni Program

There is a great need to create an Alumni database

yes - this is a great idea

Need to use this source more fully for funding, ideas, and gatherings.

How can we sustain alumni interest in our department is what we need to discuss

Once they graduate you never see them again.

There should be an active alumni program

More alumni support is a good idea.

Better leverage the Alumni network to assist the University.

Appendix C - Curriculum Review - General Skills (Vote)

Participant Instructions

Place the list in order of importance with the most important skill listed at the top.

INSTRUCTIONS: Place cursor on item, left click, holding the left mouse button down, drag item to desired location in the list.

Voting Results

Rank Order (Allow bypass)

Number of ballot items: 18

Total number of voters (N): 11

Rank Sum

155	1. Problem Solving Skills
150	2. Critical Thinking
144	3. Listening Skills
142	4. Project Management Skills
140	5. Oral Communication Skills
131	6. Written Communication Skills
131	7. Leadership
130	8. Ethics
127	9. Teamwork Skills
116	10. Business Process Analysis
109	11. Analytical / Conceptual Skills
100	12. Motivation
87	13. Presentation Skills
65	14. Quantitative Analysis
58	15. Forecasting, Predicting
55	16. Computer Literacy
30	17. General Legal Knowledge

Appendix D - Curriculum Review - Course Ratings (Vote)

Participant Instructions

Please rate each item on a scale of lowest to highest. A 5 is considered high.

Voting Results

5-Point - 5 is highest importance

(Allow bypass)

Number of ballot items: 36

Total number of voters (N): 10

Mean

4.80	1. IFS330
4.50	2. INF282
4.40	3. INF284
4.30	4. MSIS640
4.20	5. MSIS645
4.20	6. IFS485
4.20	7. MSIS650
4.10	8. MSIS635
4.10	9. IFS110
4.00	10. MSIS660
4.00	11. FIN605
4.00	12. MSIS680
4.00	13. IFS440
3.90	14. IFS435
3.90	15. IFS310
3.80	16. IFS420
3.80	17. IFS300
3.70	18. MSIS685
3.70	19. IFS410
3.70	20. IFS305
3.70	21. IFS105
3.70	22. INFS286
3.60	23. MSIS665
3.50	24. MSIS675
3.50	25. MSIS625
3.50	26. IFS430
3.50	27. MKT625
3.40	28. IFS402
3.40	29. MSIS655
3.40	30. ACC605
3.40	31. INF186
3.30	32. IFS384
3.20	33. INF260
3.20	34. INFS120

3.10 35. MSIS606
3.10 36. MSIS670

APPENDIX E
Intellectual Contributions
Northern Kentucky University
January 1, 2005 - December 31, 2007

Information Systems

Braun, Frank (Lecturer)

Conference Proceedings

Conference Proceeding (Published)

BRAUN, F. *The Role of Accountability in Motivating Knowledge Sharing Among Team Members in Information Technology Projects*. Americas Conference on Information Systems 2006.

Cata, Teuta (Assistant Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Lee, S. M., Cata, T. (2005). Critical Success Factors of Web-Based e Service: The Case of e-Insurance.. *International Journal of e-Business Research*, 1(3), 21-40.

Journal Article, Academic Journal (Published)

Cata, T. (2006). "Challenges and opportunities of silent commerce – applying Radio Frequency Identification technology". *Journal of Internet Banking and Commerce*, 11(1).

Journal Article, Academic Journal (Published)

Cata, T., Raghavan, V. "Lifecycle of Outsourcing Relationships: A Case Study Investigation". *Journal of Information Technology Cases and Applications Research*, 8(3), 11-26.

Journal Article, Academic Journal (Accepted)

Cata, T., Lee, S. M. "Adoption of Web-Based Application in the Financial Sector: The Case of Online Insurance". *To appear in Journal of Internet Commerce*, 5(2), 41-61.

Journal Article, Academic Journal (Accepted)

Martz, W. B., Cata, T. "Business Informatics as Research Discipline". *To appear in International Journal of Teaching and Case Studies*, 1(1-2).

Conference Proceedings

Conference Proceeding (Published)

Cata, T. (2005). *"The impact of firm's age and size on website security level: The case of web-based insurance activities."*. Las Vegas, NV: 4th Annual Security Conference.

Conference Proceeding (Published)

Cata, T. (2005). *"Purchasing Behavior of Internet Shoppers: An Experimental Study"*. Las Vegas, NV: ISOneWorld Conference.

Conference Proceeding (Published)

Newell, J., Cata, T. (2005). *Biometric Security and its Future*. Las Vegas, NV: 4th Annual Security Conference.

Conference Proceeding (Published)

Vairappan, C., Cata, T., Sakaguchi, T. (2005). *"Privacy and security in global context: A case of Japan"*. 6th Annual Global Information Technology Management World Conference.

Conference Proceeding (Published)

Downing, M., Cata, T. (2005). *"Privacy legislation as a method to establish consumer trust in global electronic commerce"*. Proceedings of the 36th Annual Meeting of Decision Science Institute.

Conference Proceeding (Published)

Cata, T., Raghavan, V. (2005). *"Lifecycle of outsourcing relationship - A multiple case study approach."* (pp. 863-868). International Business Information Management Association Conference.

Conference Proceeding (Published)

Cata, T. (2005). *The Website Features and Categories in the Context of Fortune e-50 Companies* (pp. 213-222). Proceedings of the International Business Information Management Association Conference.

Conference Proceeding (Published)

Vairappan, C., Cata, T., Sakaguchi, T. (2006). *"E-commerce development in Japan"*. 7th Annual Global Information Technology Management World Conference.

Conference Proceeding (Published)

Cata, T., Raghavan, V. (2006). *"An Investigation of Lifecycle of Outsourcing Relationship"*. Los Angeles, CA,: In Proceedings of the Fifth Annual International Smart-Sourcing Conference (Eds. Shailendra Palvia and Praveen Katwa) Sept. 21-23, 2006 pp.42-50.

Conference Proceeding (Published)

Cata, T. (2006). *Trends of Web Sales in Financial Industry - The Case of e-Insurance*. International Business Information Management Association Conference.

Conference Proceeding (Accepted)

Cata, T. *Outsourcing Web-based Applications - The Case of e-Insurance*. ISOneWorld 2007.

Conference Proceeding (Accepted)

Cata, T., Martz, W. B. *Student's Perception about: Outsourcing, IS careers and Academic Programs*. ISOneWorld 2007.

Conference Proceeding (Accepted)

Herzog, N., Cata, T., Sakaguchi, T. *Use of Biometrics as Enhanced IT Security: A Preliminary Study*. Eighth Annual Global Information Technology Management (GITM) World Conference.

Duggal, Sudesh M. (Full Professor)

Conference Proceedings

Conference Proceeding (Accepted)

Simkonis, C., Duggal, S. *Offshore Outsourcing: New Spin or Same Old Business.*

Martz, William B. (Full Professor)

Book Chapters

Book, Chapter in Scholarly Book-New (Published)

Martz, W. B., Reddy, V. (2005). *Critical Success Factors for Distance Education Programs.* Encyclopedia of Information Science and Technology.

Book, Chapter in Scholarly Book-New (Published)

Martz, W. B., Reddy, V. (2005). *Five Factors for Operational Success in Distance Education* (pp. 1265-1271). Encyclopedia of Online Learning and Technology.

Book, Chapter in Scholarly Book-New (Published)

Martz, W. B., Shepherd, M. (2005). *A new Concern for Distance Education: Lower Perceived Performance.* Encyclopedia of Online Learning and Technology.

Book, Chapter in Scholarly Book-New (Published)

Martz, W. B., Shepherd, M. (2007). *Lower Perceived Performance in Internet Testing* (vol. 10). Educational Innovation in Economics and Business.

Book, Chapter in Scholarly Book-New (Published)

Martz, W. B., Neil, T., Williams, R., Biscaccianti, A. (2007). *The Entrepreneurial Lifestyle* (vol. 10, pp. 638 pp). Educational Innovations in Economics and Business.

Book, Chapter in Scholarly Book-New (Accepted)

Beranek, P., Martz, W. B., French, M. *A Comparison of Training Techniques for Developing Trust in Virtual Teams.* Encyclopedia Of Networked And Virtual Organizations.

Book, Chapter in Scholarly Book-New (Accepted)

Martz, W. B., Shepherd, M., Raghavan, V. *Demonstrating the Ambiguity of Consensus.* Encyclopedia of Networked and Virtual Organizations.

Book, Chapter in Scholarly Book-New (Accepted)

Martz, W. B., Gardner, S. (2007). *Using the Web for Contract Negotiations.* Encyclopedia of e-Collaboration.

Book, Chapter in Scholarly Book-New

Martz, W. B., Shepherd, M., Ferguson, J., Klein, G. (2007). *A Survey of Distance Education Programs* (vol. 10). Education Innovation in Economics and Business.

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Martz, W. B. (2005). A Systems Approach to Technology Transfer: Contributions from Reference Disciplines. *Comparative technology Transfer and Society*.

Journal Article, Academic Journal (Published)

Martz, W. B., Beranek, P. (2005). Making Virtual Teams More Effective: Improving Relational Links. *Team Performance Management Journal*, 11(5/6).

Journal Article, Academic Journal (Published)

Martz, W. B., Klein, G., Jiang, J., Wang, E. (2005). CIO Strategies for IT Value Achievement. *International Journal of Management Theory and Practices*, 6(1).

Journal Article, Academic Journal (Published)

Martz, W. B., Neil, T., Williams, R., Biscaccianti, A. (2005). A Multi Cultural Perspective of the Entrepreneurial Lifestyle. *Journal of enterprising Culture*, 13(4), 357-379.

Journal Article, Academic Journal (Published)

Martz, W. B., Neil, T., Biscaccianti, A. (2006). Exploring Entrepreneurial Decision Making Strategies. *International Journal of Innovation and Learning*, 3(6), 658-672.

Journal Article, Academic Journal (Published)

Martz, W. B., Shepherd, M. (2006). Media Richness Theory and the Distance Education Environment. *Journal of Computer Information Systems*, 47(1).

Journal Article, Academic Journal (Accepted)

Martz, W. B., Klein, G., Beranek, P., Jiang, J. (2006). The Relationship of Control and Learning to Project Performance. *To appear in Cybernetics and Systems*, 37(2-3), 137-150.

Journal Article, Academic Journal (Accepted)

Martz, W. B., Shepherd, M. (2006). Organizational Memory: Three Experiments on the Quality of Information.

Journal Article, Academic Journal (Accepted)

Martz, W. B., Cata, T. Business Informatics as a Research Discipline. *To appear in International Journal of Teaching and Case Studies*.

Journal Article, Academic Journal (Accepted)

Martz, W. B., Shepherd, M. M. Managing Distance Education for Success. *To appear in International Journal of Web-Based Learning and Teaching Technologies*, 2(2), 50-59.

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