WHAT ARE THE CAREER PROSPECTS IN IS / IT?

Here’s what the experts say …

“The Bureau of Labor Statistics (BLS) believes there will be 501,000 systems analysts jobs between now and the year 2005.”

There are no more dreaded words in corporate America than these: “The system is down.”
Your boss is screaming, your clients are whining. What can you do? Call a computer systems analyst, that’s what. Systems analysts are the indispensable people who install, customize, and supervise computer operations at offices and factories across the nation. And now, with their services increasingly in demand, it’s no surprise that they have the best job in America, according to the long range projections issued by the Labor Department (December, 1997). Among the top three fastest growing occupations for the next ten years, database administration and systems analysts were ranked first and third. Employment in each of the occupation is forecasted to grow more than 100 percent. The Bureau of Labor Statistics (BLS) believes there will be 501,000 systems analysts jobs between now and the year 2005, a gain of 110% from today’s 455,000 – and that 501,000 – job forecast represents a 37% upward revision from just two years ago.

The New Corporate C.I.O.’s
“Companies are realizing how crucial technical expertise is in staying ahead of the competition.”

In corporate America, an increasing number of Chief information officers – basically, they are the folks in charge of the computers - are amassing greater power as top bosses and company boards realize how
crucial technical expertise is in staying ahead of the competition.

Because technology now touches every corner of almost every company’s business, Ms. Claudio said, chief information officers are probably better prepared than other top managers to assume new responsibilities – including the mantle of chief executive.

A recent survey by Egon Zehnder International, an executive search firm, found that companies are increasingly looking to a new generation of chief information officers to be business strategists, and that these “new” C.I.O.’s spend at least half their time outside the information technology department on efforts like developing and incubating new prospects for electronic commerce.

The survey found that 15 percent of new chief information officers now serve on the boards of their companies and 70 percent are on their companies’ high-level management teams. Those numbers are up sharply from a decade ago, industry specialists say, when 0 percent and 10 percent would have been more likely figures.

The information officers are reveling in their elevation from back-room tinkerers with fancy titles to strategic thinkers on an equal footing with corporate presidents, chief operating officers and chief financial officers.

“We’re in the third generation of C.I.O. now,” Mr. Lochow said. “The first generation was made up of techies, like data center directors. And although the second generation was more vocal in terms becoming part of corporate planning, its members were still one level below directly reporting to their chief executives. Now, however, thanks to the Internet, C.I.O.’s are moving directly into corporate decision-making.”

“I’m a business professional with IT expertise,”

The key technology workers may soon not come from IT at all, as managers rethink where they look for new talent. It’s the critical need for both business and technology skills that has many IT pros on the ropes, fighting off business peers for choice IT jobs.

With today’s IT talent pool looking more like a rapidly drying puddle and the need for business skills growing, many companies say they’ve started looking outside traditional sources for talent to fill IT positions that include business responsibilities.

Meanwhile, the nation’s business school’s are rebuilding MBA programs with technology as a core business strategy. Graduates of these new programs may be potent competition. And enrollments in MIS degree programs, which stress a combined business and technology curriculum, have doubled or tripled at many colleges and universities.

“If you can write code, understand the technology and manage it, you’re a lot commodity,” says Ranjay Gulati, associate professor and director of the Center For Research on Technical Innovation and E-Commerce at Northwestern University’s Kellogg Graduate School of Management in Evanston, Ill.

The bottom line: A wave of new-style IT professionals is starting to build. If you don’t develop business skills to complement your technical abilities, that swell might just sweep you away.

from “The Evolving IT Worker” by Sharon Watson, COMPUTERWORLD, July 31, 2000
WHAT ARE THE REQUIREMENTS FOR A MAJOR IN IS / IT?

IS/IT is an area of concentration in the Business Administration major. Students take B Adm 274 (Operation Research), Psych 201 (Social Psychology) and either B Adm 321 (Individual Behavior in Organizations) or B Adm 323 (Organizational Design and Environment), along with four of the information systems courses that follow.

(Note: not every course is offered in each semester)

B ADM 390 – Information Technology for Networked Organizations
Examines the information technology and its impact on modern organizations. Topics include: (1) IT, Internet Technologies, E-Commerce and business models, (2) organizing and modeling enterprise data, (3) Network protocol and architecture, (4) development of IT systems and, (5) IT management and organization design.
Prerequisite: CS 105 and at least two of the following: FIN 254 and 274, ACCY 201, B Adm 202 and 210.

B ADM 391 / ACCY 332 – Introduction to Management Information Systems
Analyzes information systems from a management Control perspective, emphasizing organization Environment, technology, decision models and performance evaluation as determinants of information processing requirements; cases and design project explore the management of information processing systems, major functional applications and impacts of information technology on individual and society.
Prerequisite: CS 105 or equivalent, or consent of instructor.

This is an introductory MIS/IT course, where a variety of topics are covered to give students an overview on the important concepts, developments,
technologies, and methods in MIS/IT.

**B ADM 392 / ACCY 333 – Information Organization in MIS**
Data collection, classification, verification, and transmission; file organization, including sequential and random processing techniques, record locating, overflow procedures, and file security; analysis of alternative methods of data organization; commercial database management systems; design of data processing systems; and manipulation of database to create value-added information.

**Prerequisite:** BA 391/ACCY 332 or consent of instructor.

*This is a more technical course focused primarily on database management. Students will have the opportunity to develop a database project using MS Access.*

**B ADM 393 / ACCY 334 – Information System Analysis and Development**
Essential steps in developing a management information systems, including primary planning, design, feasibility analysis, implementation schedule, and post-implementation review of the system; including a semester-long project which familiarizes students with methodology and techniques.

**Prerequisite:** BA 392/ACCY 333, or consent of instructor.

*This is a more managerially oriented course, focused on the management of information technology. A collection of business cases on the corporate uses of information technology and the issues involved will be discussed. Students will have the opportunity to develop a team project on reengineering using information technology.*

**B ADM 394 / ACCY 335 – Management Information and Control Systems**
Integration of behavioral, quantitative, and system design concepts in relation to professional work in the management information systems area.
**Prerequisite:** BA 393/ACCY 334, or consent of instructor.

*This is a capstone course where students will develop a team project using the various information technologies and methods they learned from the proceeding MIS/IT courses. They also are required to work with local companies on real-world problems related to MIS/IT.*

**B ADM 395 – Decision Support Systems**
Examines the recent developments in information technology- such as artificial intelligence, database management, expert systems, group decision support, machine learning methods, and computer-supported coordination technology-for managerial decision support. Real-world cases of applying these information technologies to management information systems will be discussed.

*Prerequisite:* BA 392/ACCY 333.

*This course uses data management, taught in BA 392, as a basis, but with a unique focus on using information technology for decision support.*

**B ADM 396 – Enterprise Computing Management**
Course topics include: Unix Operating System, Internet and the World Wide Web, C/C++ programming, Java, and Scripting languages. Course covers a broad spectrum of programming paradigms that form the basis of enterprise computing.

**B ADM 397 – Management of Data Communications**
Course stresses a top-down, business oriented approach to evaluating and selecting data communications technology. Students who successfully complete this course gain practical knowledge of network telecommunications technology, including hardware and software. They learn enough to allow them to help design systems that include network components.
B ADM 294 – Seminar
This class addresses advanced computing methods and their techniques, as well as applications to the real world of business. The topics covered include: Intro to UNIX, Internet, and the World Wide Web; using HTML to design Web pages; C/C++ programming and Java programming.

This course involves a semester-long individual project, weekly programming assignment and two exams to assist students in gaining a firm understanding of the underlying critical technologies supporting the electronic commerce.

B ADM 295 – E-Commerce Applications and Web-Based Systems
The advent and popularization of electronic commerce is largely due to the emergence of recent technologies. This course aims to prepare students with technical skills for building web-based e-commerce applications. Topics include DHTML, JavaScript, VBScript, XML, Active Server Pages (ASP). This course also involves intensive hands-on exercises and a project in developing a web site with e-commerce capability. After taking the course, students should reach a basic level of competence and familiarity with the current e-commerce technologies and development. Nevertheless, the focus of the course is more on general principles than the specific technologies, so that students can become capable of keeping up with the ever-changing technologies after taking the course.

Fundamentals of E-Business
It’s hard to ignore the ongoing buzz: the Internet, the World Wide Web, Electronic Commerce, Net Markets, Virtual Communities. How are all these transforming our lives and, in particular, the way we conduct business? How are various companies - large, small, entrepreneurial - using information technologies to transform their businesses? What new opportunities do they afford? What are the pitfalls of these new modes of doing business?

This introductory course will explore the above
questions and issues. It will focus on the Internet and Web-enabled applications that are being used within businesses and to facilitate connections between consumers, businesses, and public organizations. Through a mixture of lectures, guest lectures, and case study discussions, students will learn to understand the implications of networked technologies, as they transform traditional business functions and the global marketplace.
ALTERNATIVE COURSES AND RECOMMENDED ELECTIVES OFFERED BY THE COMPUTER SCIENCE AND ACCOUNTING DEPARTMENTS

Because the course offerings in MIS/IT (BA 391, 392, 393, 394, and 395) are not always available every semester, the program provides flexibility for students. A petition can be filed to substitute alternative courses. These courses are also recommended as electives.

If a student should decide to take the CS courses, it is suggested that they take one of the programming courses offered by the CS department, such as the C programming language course, CS 110, first.

C S 300 - Data Structures for Non-Computer Majors
Introduction to the concepts, principles, and use of computing data structures for non-computer majors. Topics include pointer, lists, stacks, trees, hashing, graphs, and sorting. Prior experience with the C programming language is assumed. This course meets for half a semester.

Prerequisite: CS 110C or equivalent, or consent of instructor. Students may not receive credit for both CS 300 and 225. Computer science and Computer engineering majors may not receive credit for CS 300.

C S 301 - Files and Information Systems for Non-Computer Majors
Introduction to the concepts, principles, and use of computing information systems for non-majors. Topics include file organization and processing, file storage devices, sorting and retrieval of information, and an introduction to database concepts. This course meets for half a semester.

Prerequisite: CS 110 or 125 or equivalent, or consent of instructor. Graduate students in computer science may not receive credit for CS 301.

C S 302 - Software Design and Development for Non-Computer Majors
Introduction to the concepts, principles, and practices used in modern software design and development for non-majors. Topics include software life cycle, planning, requirements, design, testing, and maintenance.
Introduction to the use of CASE tools. This course meets for half a semester

**Prerequisite:** CS 300 or equivalent, or consent of instructor. Students may not receive credit for both CS 302 and 327. Computer science and Computer engineering majors may not receive credit for CS 302.

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**C S 303 - Computer Device Interface for Non-Computer Majors**

Introduction to the concepts, principles, and use of computer interfacing mechanisms. Designed for students not majoring in computer science/engineering, the course deals with hardware and software issues of interfacing a computer to various types of input/output and scientific equipment. Topics include standard interfaces, digital-to-analog and analog-to-digital conversion, digital signal processing and networking. This course meets for half a semester.

**Prerequisite:** CS 110 or equivalent, or consent of instructor. Students may not receive credit for both CS 303 and 384. Computer science and Computer engineering majors may not receive credit for CS 303.

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**C S 311 - Database Systems**

Examines the logical organization of databases: the entity-relationship model; the hierarchical, network, and relational data models and their languages. Functional dependencies and normal forms. Design, implementation, and optimization of query languages; security and integrity; concurrency control, and distributed database systems.

**Prerequisite:** CS 225 or 310, or consent of instructor.

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**ACCY 331 - Accounting Information Systems**

Examines the fundamentals of accounting systems design, including systems analysis and design techniques; surveys hardware and software considerations; analyzes accounting applications within functional areas of the firm; and studies the control of computerized systems in the business environment.

**Prerequisite:** ACCY 202 and CS 105, or equivalent

*This course has some overlap with the material covered in BA 391. However, it is focused more on the accounting information management.*
# Sample Schedule

## For IS/IT Majors

**First Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 102 or 103</td>
<td>3</td>
</tr>
<tr>
<td>Math 125</td>
<td>3</td>
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<td>Composition I</td>
<td>3</td>
</tr>
<tr>
<td>CS 105</td>
<td>3</td>
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<tr>
<td>Foreign Language, UI Freshman Discovery Course, or General Education</td>
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<td><strong>Total</strong></td>
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**Second Year**

<table>
<thead>
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<tr>
<td>Accy 201</td>
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<tr>
<td>Econ 172</td>
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<tr>
<td>Foreign Language or General Education</td>
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<tr>
<td>General Education or Elective (e.g., C S 110 or C S 125)</td>
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<tr>
<td>Psychology 201</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
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**Second Year**

<table>
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<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Accy 202</td>
<td>3</td>
</tr>
<tr>
<td>Econ 173</td>
<td>3</td>
</tr>
<tr>
<td>Econ 300</td>
<td>3</td>
</tr>
<tr>
<td>Fin 254</td>
<td>3</td>
</tr>
<tr>
<td>Foreign Language or General Education</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
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### Third Year

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</thead>
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<tr>
<td>B Adm 210</td>
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<tr>
<td>B Adm 274</td>
<td>3</td>
</tr>
<tr>
<td>B Adm 391</td>
<td>3</td>
</tr>
<tr>
<td>Composition II</td>
<td>3</td>
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<tr>
<td>Elective (e.g., CS 300)</td>
<td>3</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>B Adm 200</td>
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</tr>
<tr>
<td>B Adm 202</td>
<td>3</td>
</tr>
<tr>
<td>B Adm 321 or 323</td>
<td>3</td>
</tr>
<tr>
<td>B Adm 393</td>
<td>3</td>
</tr>
<tr>
<td>Elective (e.g., C S 301)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

### Fourth Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Adm 392</td>
<td>3</td>
</tr>
<tr>
<td>B Adm 490 / B Adm 294</td>
<td>3</td>
</tr>
<tr>
<td>Electives (e.g., C S 302 or 303)</td>
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<td><strong>Total</strong></td>
<td><strong>15</strong></td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Adm 389</td>
<td>3</td>
</tr>
<tr>
<td>B Adm 394</td>
<td>3</td>
</tr>
<tr>
<td>Electives (e.g., B Adm 395 or Accy 331)</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

*REMEMBER: Business Administration majors, including IS/IT majors, must take 16 elective hours outside of Accounting, Business Administration, and Finance*
JOB OPPORTUNITIES

The shortage of experienced information technology professionals in the job market is turning into really great news for the new crop of college graduates, entry-level IT job candidates and career-changers (Computer World 6/1/98). Three of four IT professionals have received calls from headhunters in the past year. Those IT professionals solicited by employment recruiters received an average of seven calls in the past 12 months.

Information Week (May 18, 1998) reports that the salaries of IT professionals climb by an average of 11%, a rate well above the average of other professions. That's quite amazing, considering that inflation is low and typical workers in other fields have seen their paychecks increase by a paltry 3% to 4% this past year—a quarter of what IT professionals received.

"Until there is a greater supply of IT people, the demand will continue to drive up competition for talent, compensation, and other perks," says Harris Miller, president of the Information Technology Association of America, an industry trade group.

The year 2000 crisis and the race to develop new client-server applications have helped make programmers and systems analysts among the most sought-after IT talent. But the ability to sling code enables programmers to make more money than analysts, says Kurt Wilkinson, president of Wilkinson SoftSearch, an IT job recruiter. "In the past, the move from programmer to analyst was often a step up the ranks, but right now, programmers are worth their weight in gold."

While people who know legacy programming languages such as Cobol are in demand because of year 2000 projects, newer programming language talent is also aggressively sought and handsomely paid. "Object-oriented programmers who work in languages like C++ are among the hardest to recruit," says Paul Davenport, president of Resources Systems Group, an IT job recruitment firm. In addition to C++ and Cobol, other hot programming skills include Web-based languages. "Anything Internet is hot," says M. Victor Janulaitis, president of Positive Support Review, an IT management consulting and research firm. Adds recruiter Wilkinson: "Web-related talent is among the toughest to find."
FREQUENTLY ASKED QUESTIONS

1. May I take the BA 390’s series in a different sequence?
   Yes, you can take the four courses in different sequences, although in principle, BA 391 should be taken first and BA 394 should be taken last.

2. May I take two or three IS/IT courses in the same semester?
   Yes, students can take more than one course out of the sequence in one semester, although you don’t want to take too many courses with computer projects all due at the end of the semester. Try to balance your workload in selecting your “portfolio”.

3. What are the job opportunities for IS/IT majors?
   The job market seems to be excellent for IS/IT graduates now, because most major companies are in the process of reengineering their business processes using computerized systems and information technology as the levers. You can check the Commerce Career Services Office for the listing of IS/IT job offers. The demand is generally high.

4. What kind of students are companies looking for?
   The message we constantly get from corporate recruiters is that they are looking for graduates with both computer skills and managerial knowledge. For MIS/IT majors in the Department of Business Administration, it is usually a good idea to take as many CS courses as possible. Knowledge of a structural programming language, such as C or C++ is also encouraged.

5. What is the current enrollment of the IS/IT program?
   The IS/IT program is one of fastest growing programs in the College of Commerce, the trend line shown in the following a rapidly growth in recent years:

<table>
<thead>
<tr>
<th>Year</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>27</td>
</tr>
<tr>
<td>1994</td>
<td>40</td>
</tr>
<tr>
<td>1995</td>
<td>64</td>
</tr>
<tr>
<td>1996</td>
<td>99</td>
</tr>
<tr>
<td>1997</td>
<td>136</td>
</tr>
<tr>
<td>1998</td>
<td>228</td>
</tr>
</tbody>
</table>
6. What are the starting salaries of IS/IT graduates?
The breakdown of undergraduate by major:

<table>
<thead>
<tr>
<th>Major</th>
<th>Average</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mgmt. Info System</td>
<td>$41,586</td>
<td>33,000-55,000</td>
</tr>
<tr>
<td>Entrepreneurship</td>
<td>36,167</td>
<td>31,000-40,500</td>
</tr>
<tr>
<td>Food &amp; Agribus. Mgmt.</td>
<td>27,000</td>
<td>(one reported)</td>
</tr>
<tr>
<td>Industrial Distrib. Mgmt.</td>
<td>39,714</td>
<td>25,000-47,000</td>
</tr>
<tr>
<td>Management Science</td>
<td>57,000</td>
<td>(one reported)</td>
</tr>
<tr>
<td>Marketing</td>
<td>33,049</td>
<td>20,000-50,000</td>
</tr>
<tr>
<td>Organ. Admin.</td>
<td>31,636</td>
<td>22,000-50,000</td>
</tr>
<tr>
<td>Accountancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Accounting</td>
<td>34,128</td>
<td>28,000-47,524</td>
</tr>
<tr>
<td>Public Accounting</td>
<td>34,602</td>
<td>25,000-42,000</td>
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<tr>
<td>Economics</td>
<td>31,650</td>
<td>23,500-38,400</td>
</tr>
<tr>
<td>Finance</td>
<td>36,308</td>
<td>24,000-70,000</td>
</tr>
</tbody>
</table>
Faculty Profiles

Timothy G. Babbitt
Assistant Professor of Business Administration


Teaching and Research Areas: Teaching interests are: management of IS, information technology and business value, IS strategy, telecommunication/network technology, and electronic commerce. Research interests are: management of IS, MIS human resources, knowledge management, and philosophy of the discipline.

John S. Chandler
Associate Professor of Accountancy


Teaching and Research Areas: Teaches courses in management information and control systems. Research focuses on groupware, group decision making across networks, and machine learning algorithms and their application to business problems. Consultant to: Midwest Universities Consortium for International Activities; MIS Specialist for the Bangladesh Management Education Training Project and U.S.AID.
Judith Gebauer  
Assistant Professor of Business Administration  
  
**Degrees:** Ph.D. Economics/MIS, University of Freiburg, Germany, 1996; M.S. Economics, University of Freiburg, Germany, 1991.  
  
**Teaching and Research Areas:** Teaches management and strategy of electronic business. Research focuses on management of emerging technologies and its impact on organizations, business relationships, and innovative forms of organizations, the changing role of intermediaries, and electronic markets.  
  
Ruth C. King  
Assistant Professor of Business Administration  
  
**Degrees:** Ph.D. Information Systems, University of Texas at Austin, 1987; M.A. Accountancy, Virginia Polytechnic Institute and State University, 1981; B.A., National Cheng-Chi University, Taiwan, 1976.  
  
**Teaching and Research Areas:** Teaches courses in management of information systems, database design and management, telecommunications technology, systems analysis and design, decision support systems and impact analysis of emerging technology. Research focuses on strategic management of information systems, computer supported collaborative work, business process redesign and organizational transformation, information systems professionals management, innovative use of information technology within and among different industries and countries.
Michael J. Shaw  
*Professor of Business Administration*

**Degrees:** Ph.D. Information Systems, Purdue University, 1984; M.S. Industrial Engineering, S.U.N.Y. at Buffalo, 1980; B.S. Industrial Engineering, National Tsing Hua University, Taiwan, 1978.

**Teaching and Research Areas:** Teaches courses in managing information technology, database management, information systems, artificial intelligence / expert systems. Research focuses on managing information technology and manufacturing technology, decision support systems, and computer integrated manufacturing. Conducts research projects with Motorola, IBM, Ford, and Caterpillar.

Riyaz T. Sikora  
*Assistant Professor of Business Administration*

**Degrees:** Ph.D. Business Administration, University of Illinois, 1994; P.G.D.M. Indian Institute of Management, 1988; B.S. Engineering Electronics and Communications Engineering, Osmania University, India, 1987.

**Teaching and Research Areas:** Teaches AI / Expert systems, database management systems, and management information systems. Recent research interest includes intelligent manufacturing, AI / Expert systems, business applications of machine learning in general, genetic algorithms in particular.
Peter A. Silhan  
*Associate Professor of Accountancy*


**Teaching and Research Areas:** Teaches courses in management information systems and theory of accounting systems design. Research focuses on usage of accounting information and information systems design.

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Mu Xia  
*Assistant Professor of Business Administration*

**Degrees:** Ph.D. Information Systems, University of Texas at Austin, 2001; B.S. Electrical Engineering, Tsinghua University, China, 1995.

**Teaching and research areas:** Teaches e-commerce applications and web-based systems, information systems. Research focuses on business-to-business e-commerce, economics of e-commerce and information systems.

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Office of Undergraduate Affairs

College of Commerce and Business Administration  
University of Illinois at Urbana-Champaign  
(217) 333-2740