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DESIGNING AN ELECTRONIC COMMERCE CURRICULUM

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EDUCATION

DESIGNING AN ELECTRONIC COMMERCE CURRICULUM

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ABSTRACT

This paper traces the development and content of the Electronic Commerce curriculum at the Daniels College of Business (DCB) at the University of Denver. The Daniels College has taught an Integrated MBA curriculum since 1993. Electronic Commerce topics are covered at appropriate points in the curriculum. A graduate elective course in Electronic Commerce for MBAs has been taught twice a year since the summer of 1995. A Center for the Study of Electronic Commerce was established in March of 1995. In January 1998, the DCB faculty approved a specialization in Electronic Commerce for MBAs as a variant of an MIS specialization which had been offered since 1984. While the MIS specialization contains 5 IT courses, the Electronic Commerce specialization contains 3 IT courses and two Marketing courses.

In June 1998, an MS in Information Technology was approved with two tracks: one in Business Information Technology and another in Electronic Commerce.

Keywords: electronic commerce, electronic data interchange, teaching electronic commerce, MBA with electronic commerce concentration, master of science in IS programs.

I. INTRODUCTION

An elective course in Electronic Commerce (EC) was offered in the Graduate School of the Daniels College of Business(DCB) at the University of Denver for the first time in the summer of 1995. As is the case with similar endeavors, the first course was something of an experiment. The experiment was successful. Student feedback was quite favorable. It was offered again in the Winter Quarter of 1996 and has been offered every other quarter since then.

The DCB introduced an integrated MBA curriculum in 1993. Traditional academic discipline-based courses were replaced by an MBA core that integrates traditional topics and makes extensive use of cross-disciplinary teaching teams (Slater, McCubbrey and Scudder, 1995). For example, one course, entitled "Positioning in the Competitive Environment" integrates business strategy, marketing strategy and strategic uses of Information technology (IT).

MBA students have long had the option of pursuing a specialization. At the Daniels College, most specializations require five courses. The DCB has offered a specialization in MIS since 1984, comprised of five courses: Systems Analysis and Design, Database Management Systems, a two-course sequence in Software Engineering, and a managerial capstone. The current orientation in the four technical courses is the object-oriented paradigm; the language used in the Software Engineering courses is Java. When the EC elective was introduced, MIS/MBA students were permitted to substitute it for the managerial capstone.

II. BACKGROUND

TIES WITH THE INTERNATIONAL ACADEMIC EC COMMUNITY

Denver University (DU) faculty first became involved in EC in the mid 1980's as the result of an interest in Electronic Data Interchange (EDI), Strategic Information Systems (SIS), and Interorganizational Systems (IOS). In 1987, we began to meet with other faculty from several countries with similar interests at the "Bled Conferences" organized by Professor Joze Gricar in support of the EDI Project in Slovenia (McCubbrey and Gricar, 1995). From rather modest beginnings, the Bled Conference grew to be a high quality international conference on EC for both academics and practitioners. The proceedings published each year trace the migration of the academic community's interest from EDI to IOS to SIS and EC. For example, earlier papers tended to focus on EDI (McCubbrey, 1990; Imai, 1992). Later, the ties between EDI and Strategic Information Systems were noted (Galliers, Swatman and Swatman, 1993) and that Electronic Commerce was more than just EDI (Clarke, 1993).

A symposium on Research and Teaching EDI was instituted at the 1991 Conference under the initial sponsorship of the EDI (now EC) World Institute. It has been held in conjunction with the conferences each year since as a way of letting the academics and students who attend focus on issues of most interest to them. Papers presented at the Research and Teaching Symposium include both research and teaching topics.

TIES WITH THE EC PRACTITIONER COMMUNITY IN COLORADO

DU faculty helped co-found the Colorado EDI (now EC) Roundtable in 1991, an interest group of EDI users, potential users, and support organizations. The Colorado EC Roundtable is not unlike similar groups formed for the promotion of EDI and EC in other cities across the US.

In March 1994, the Board of Directors of the Colorado EDI Roundtable held a retreat to develop a strategy for moving the organization forward. One of the outcomes of the retreat was a suggestion that a Center for the Study of Electronic Commerce be established at DU.

ESTABLISHMENT OF THE CENTER FOR THE STUDY OF ELECTRONIC COMMERCE

A local executive stepped forward to provide seed money for the Center in late 1994 and the Center was formally established in the Daniels College of Business in March 1995. The Center has an educational mission and a research mission. Stated simply, its educational mission is to be sure that the DCB curriculum contains appropriate EC content in all academic disciplines, and that continuing management education courses are made available to the business community. Its research mission is to seek out and perform a small number of projects that have research value to the University and practical value to collaborating companies. More detail on the Center and its projects can be found on the Center's web site (Center, 1998)

III.THE ELECTRONIC COMMERCE COURSE

OVERVIEW

By the time the Center was established in early 1995, it became apparent to many that the pace of change in EC was accelerating. Principally this change was due to the explosion of activity on the Internet with the advent of the World Wide Web. We felt it was time to offer an elective course in EC. For us, the best way to experiment with a new course was to offer it in the summer as a "Topics in Management Information Systems" course.

When it came time to design a course in EC, we approached it from the perspectives we were most familiar with: EDI, IOS, EC and SIS.

A tentative syllabus for the EC course to be offered to graduate students in the summer of 1995 was reviewed with academic colleagues at the Bled Research and Teaching Symposium in June 1995. In general, the reaction from the academics from 15 countries in attendance (who possessed, collectively, several decades of EC experience) was that we were on the right track. Accordingly, the syllabus (Appendix I) was used to teach the first EC course at DU, unchanged from the way it was presented in Bled.

THE FIRST COURSE – SUMMER 1995

As can be seen by examination of the syllabus, the design of the first course had the following key characteristics:

Focus. The first half of the course focused on traditional EDI. It used a practitioner-oriented text authored by the then chairperson of ANSI X12, Bob Crowley. It made heavy use of both outside speakers and field trips. In most cases, outside speakers were fellow board members of the Colorado EC

Field Trips. Roundtable board member companies also served as field trip sites. Field trips included:

- Attendance at a meeting of the Colorado EC Roundtable.
- A visit to Gates Rubber Company to hear a presentation on Gates' EDI operations. Gates, an EDI user for 25 years, exchanges EDI messages with over 600 trading partners. Gates is a member of the Motor Equipment Manufacturers Association (MEMA), and the Automotive Industry Action group (AIAG), both of which have had important EDI/EC initiatives over the years. Gates personnel have also been active on various ANSI X12 committees.
- A visit to a small manufacturer of window hardware which adopted EC as a key component of their strategy. The application they discussed with the students was the vendor managed inventory (VMI) systems they have in place with their large retailer trading partners.

Guest Speakers. Guest speakers included:

- The manager responsible for US West's strategic EDI initiatives. His topic was "The Business Model Approach" to EC.
- A local consultant with expertise in both the health care industry and the standards setting process. He discussed the way that standards were set in the health care industry and the changes that were occurring as the industry moved toward government-mandated EDI.
- Two representatives from AT&T Easylink services who discussed the role of value added networks (VANs) in EC.

The second half of the course looked beyond EDI at other aspects of EC. It included a computer lab session on the World Wide Web, a discussion of emerging issues in electronic commerce, guest speakers and a team project. Guest speakers included:

- A representative of one of the smaller VANs (Datamatix) whose company maintains a capability profile for each of its customers. Datamatix receives Federal Government RFQs in electronic form each day, matches the RFQs to each of their customers' capability profiles, and then delivers, electronically, to each customer, only those RFQs which match their capability profiles.
- A manager from Lockheed-Martin who is very active in CALS efforts nationally. He presented the case for CALS (originally Computer Aided Logistics Support; now Commerce at Light Speed) as having the capability of becoming an umbrella standard for EC efforts, and introduced the students to the notion of internal EDI.

Student teams worked on projects in the business community, chosen from among a set of possible projects that the instructor lined up for them. The ones chosen included:

1. Evaluation of peer group web pages and development of specifications for a web page for a large health insurer.
2. Requirements analysis for two EDI expansion possibilities for an automotive parts distributor:

- Evaluated receipts settlement;
 - Customer inquiries into their inventory data base.
3. Feasibility of using direct deposits for student financial aid checks.
 4. Requirements analysis for adoption of EDI for claims processing at an acute care general hospital.

Class projects began about mid-way through the quarter. The instructor visited the “client” site with the student teams, and made sure there was a good definition of the problem and the project’s deliverables. He also attended a progress meeting about mid-way through the project and adjusted the project’s scope, if necessary. At the end of the project, the students made a presentation to their client, in class, and gave them a written report of their findings.

We were pleased with the way the course went in most aspects, and so were the students. Overall student valuations were approximately 4.5 on a five point scale. They particularly liked the guest speakers, field trips, lab sessions, and projects. While, for the most part, they did well on their projects, and their clients were pleased, in retrospect, they could have used more time. On the other hand, since most projects were EDI related, it was necessary to get them through the EDI fundamentals before turning them loose on a project in the business community.

THE MOST RECENT COURSE – SUMMER 1998

The syllabus for the most recent course is shown in Appendix II. As can be seen, the latest course is quite different from the first one, reflecting the rapid changes in Electronic Commerce. A new text, “Frontiers of Electronic Commerce”, (Kalakota and Whinston, 1996) was adopted in 1996 to drive the course. It covers every major topic in EC from traditional EDI to Software Agents in a thorough and readable form. We have been very pleased with the text. Supplemental readings from the web are assigned and distributed to students via a listserv set up for the class. Chat rooms and discussion areas were used in previous sections, but for simple, effective communications with our students, the

listserv seems to work best. Students are quite willing to use it too, and frequently contribute information on topics covered in class.

Over the three years the course has been offered, the guest speaker/field trip agenda changed each time. The practice of using guest speakers was maintained as it has proven to be very effective and popular with guests and students alike. The summer 1998 course was organized as follows. (For the exact sequence in which individual topics were covered, see Appendix II).

INFRASTRUCTURE

- Network Infrastructure
 - Convergence
 - Broadband Services
 - Security and Firewalls

Guest Speakers:

- ISP CEO
- Network Security Expert

EDI/CALS

- Traditional EDI, Hubs and Spokes
- VANS, Standards, Translation Software
- Next-Generation EDI; CALS
- Case: Requisite Technology (McCubbrey, 1998)

Guest Speakers:

- EDI Consultant for SMEs; Classroom case on implementation
- Gates Rubber Company; EDI in a large corporate setting

THE WEB

- Business to Business
- Business to Consumer
- Advertising and Marketing

- Case: Virtual Vineyards (Gerace, 1996)
- Lab Session: Business Models
- Guest Speakers:
 - Web Entrepreneurs; TheTrip.com, Brainplay.com

OTHER TOPICS

- Software Agents; Lab Session with Kasbah (Kasbah, 1998)
- Corporate Intranets/Extranets
- Electronic Payment Systems
- Case: Mondex (Ives and Earl, 1997)

Guest Speakers:

- Johns-Manville Corporation: Intranets and Extranets
- Consultant: Electronic Payment Systems

Projects in the business community were replaced with in-class projects after the first time the course was taught. It was apparent that, while the students learned a lot, and the companies definitely received benefits, the fact that students needed four to five weeks to master the concepts that would make them effective left too little time to work on the projects. Student projects now fall into two broad categories: research papers and web-based projects. Students who were already familiar with HTML editors and building web sites chose research topics of interest to them and wrote and presented a research paper. Topics covered in the summer 1998 class included:

- Taxation of Web sales
- Privacy issues
- XML/EDI futures
- International EC issues
- Business model for a Web-based fruit broker

Students who did not have much in the way of experience using HTML, web editors, and building Web pages undertook and presented a business-oriented project in this area.

Innovation happens quickly in EC. It has been said, “an Internet year is two months”. Students come to appreciate this from listening to the guest speakers, in particular the entrepreneurs, but the point is made in other ways as well. For example, one classroom exercise they do on the second class day demonstrates this in a vivid way. They are asked to form small ad hoc teams, divide an inheritance they have just received into investments in types of companies they feel will be winners in solving the “last mile” problem of delivering high bandwidth voice, digital, and video services to the home. Invariably, the differences of opinions of the various teams when the class reconvenes leads to a lively classroom discussion of the advantages and disadvantages of the various players (e.g. RBOCs, cable, long distance carriers, satellite, wireless, fiber optic TCP/IP telephony). Also, what almost always happens is that before the end of the quarter, an event occurs in the industry that would cause them to change the way their funds were allocated. For example, in the summer of 1998, the AT&T/TCI merger was announced two weeks after we did the classroom exercise.

Also, during the summer 1998 class, we serendipitously came upon an innovative way to generate the questions for the take home final. A local real estate investor asked if he could present his business idea to the students to critique. It involved building a virtual community of real estate brokers and investors and running online auctions. He sent some materials for us to look over. It occurred to the instructor that inviting this budding web entrepreneur to class to present his idea, and then generating the critical issues for the students to critique in the final would be an interesting way to have the students apply what they had learned. It was a very effective session, worth moving some topics around a bit in order to accommodate it. Hopefully we will be able to schedule a similar session in future sections of the course.

Finally, it is worth emphasizing again the value of the e-commerce site at the MIT Media Lab, and the use of the Kasbah site (Kasbah, 1998) as a computer lab exercise in demonstrating the use of intelligent agents in the facilitation of EC.

IV. DEVELOPMENT OF THE MBA SPECIALIZATION IN ELECTRONIC COMMERCE

As mentioned in the introduction (Section 1), the Daniels College of Business has offered an MBA specialization in MIS since 1984. MBA students opt for “personalized specializations” in which they are permitted to mix and match five courses from different academic disciplines to construct a customized specialization for themselves. Combining MIS with Production and Operations Management is but one of many possible examples. Several MBA students who had taken the EC course came to us for advice on how they could create a personalized specialization in EC. They believed that the best way to construct an EC specialization was to combine IT and Marketing courses.

Interviewing these students, we learned that they did not want to pursue the traditional paths of either Marketing or MIS, but rather wanted to have enough exposure to IT and EC techniques to enable them to function effectively in the new marketing environments. Discussions between the MIS and Marketing faculties resulted in the development of an EC specialization for MBAs consisting of five courses:

1. Electronic commerce
2. Data base management systems
3. Systems analysis and design
4. Marketing research and information management
5. Marketing in an EC environment

The description of these five courses is contained in Appendix III.

It is worth noting that the integrated MBA program at the Daniels College of Business was a definite advantage in working with our colleagues from the Marketing Department in developing the EC specialization. We had worked together for several years in developing and delivering the integrated MBA

curriculum and had been present in the classroom when each of our topics were covered. In this sort of environment, cooperating on an EC specialization combining elements of IT and Marketing was probably more easily accomplished than if we had to deal with the more typical academic “silos”.

Students opting for the EC specialization should come out with enough knowledge of both Marketing and Information Technology to be able to participate in the design and execution of technology-based marketing programs. Positioned between traditional Marketing and IT practitioners, they will serve as a “bridge” between the two disciplines because they will speak the language of each. We believe that as EC continues to grow, there will be an increasing need for students with this sort of orientation. We expect that marketing organizations, advertising agencies and information systems consulting firms will hire them.

V. DEVELOPMENT OF THE MASTERS DEGREES

In mid-1997, we started work on the development of a Master of Science in MIS. The work was begun as a result of the success of other MS programs which incorporated elements of our MBA core curriculum and ten courses in a specialized field (e.g. Finance). A senior executive from J.D. Edwards assisted us in our efforts. The executive is a co-founder and director of J.D. Edwards and a member of our external advisory board. He also teaches sections of Positioning in the Competitive Environment in the regular and Executive MBA programs as an adjunct faculty member in our department. .

The board of J.D. Edwards had asked him to head a committee on college and university relations to help deal with the projected shortage of IT graduates in order to meet the growing needs of companies like J.D. Edwards.

In fairly short order, we developed the curriculum for a Master of Science in Information Technology with two tracks, one in Business Information Technology and another in Electronic Commerce. The effort was made easier by

reference to the work of several others who have been dealing with curricular issues for the MS in IS (e.g. Gorgone and Kanabar, 1997, Gray, 1997) and by the many reports in the trade press about the current and projected shortage of trained IT professionals.

ELECTRONIC COMMERCE TRACK

The EC track for the MS in Information Technology consists of 64 credit (quarter) hours. All students take the following MBA core courses:

Foundations of Business Decisions I and II	8 hours
High Performance Management	8 hours
Positioning in the Competitive Environment – I	4 hours
Values – I	4 hours

Foundations of Business Decisions I and II combines elements of accounting, finance and statistics. High Performance Management focuses on the development of management skills that affect individual and group performance in organizations. Positioning in the Competitive Environment I, as previously described, covers business strategy, marketing strategy and IT strategy. Values I explores the larger social environment of individuals and organization through ethical, legal and political frameworks.

The EC track adds the following five courses to the five required for the MBA specialization in EC for a total of 40 credit hours in ITEC and Marketing courses:

Foundations of Information Systems
Software Engineering – I (JAVA)
Software Engineering - II (JAVA)
Networks and Telecommunications
Practicum/Project Management

These five courses are described in Appendix IV.

BUSINESS INFORMATION TECHNOLOGY TRACK

Students taking the Business Information Technology (BIT) track substitute Corporate Information Systems Management and Enterprise Systems for the two Marketing courses. The ten courses in the BIT track are therefore as follows:

Foundations of Information Systems
Introduction to Electronic Commerce
Systems Analysis and Design
Data Base Management Systems
Software Engineering (Java) –1
Software Engineering (Java) –2
Networks and telecommunications
Enterprise Systems
Corporate Information Systems Management
Practicum/Project Management

Course descriptions for the Corporate Information Systems Management and Enterprise Systems courses are given in Appendix V.

The Master of Science degrees in Information Technology were approved by the DCB administration and faculty in April 1998, by the University's Graduate Council in May 1998 and by the Board of Trustees in June of 1998. Students are enrolling in the degree programs starting in the Fall Quarter, 1998, although marketing efforts for the degrees will focus on Spring 1999 enrollments.

VI. CONCLUSIONS

The sequence we followed in arriving at our EC curriculum is probably a logical model for others to follow. In priority sequence, these are the points that were important in our setting:

1. Be sure that all students, graduate and undergraduate, are exposed to EC concepts throughout the curriculum. This approach is more easily managed if the curriculum is an integrated one. It is important in all instances, however, because EC seems to be shaping up as the way that business will be done in the future.
2. Offer an EC elective. It could follow the approach we have taken at DU, or it could take another tack. Our experience with our graduate level elective is that the broad coverage of EC is preferable to digging more deeply into the technical details of building and managing web sites, for example.
3. Develop an EC specialization or track within degree programs. We expect our offerings will be well accepted by students and employers. We have received more than our fair share of publicity in the local business press.
4. Our next step is to migrate the courses to the undergraduate curriculum, first as an undergraduate minor in EC and then as a major.

Given the pace of change in EC and the increasing evidence that it will be an important element of strategy, the faculty at the Daniels College of Business believes that EC is important that business students be trained in its fundamental concepts and the way it is deployed by organizations. While this paper has focused on EC in the graduate programs at DCB, EC concepts are embedded in our (integrated) undergraduate core curriculum as well.

Editor's Note: This paper was fully refereed. It was received on August 9, 1998 and accepted on August 26. It was published January 4, 1999 as one of the inaugural papers for CAIS.

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APPENDIX I

SYLLABUS MIS 4980 – SUMMER 1995

ELECTRONIC COMMERCE

TEXT

"EDI – Charting a Course to the Future", by R.T. Crowley

COURSE DESCRIPTION

EDI has been in use for over twenty-five years. Beginning with proprietary standards established by large "hub" companies and forced upon their smaller suppliers, EDI evolved to industry standards, national standards and now international standards. The pace of adoption has been slower than what might have been anticipated, given the demonstrated benefits EDI can deliver. Recently, however, more companies are adopting EDI in order to obtain the benefits of transformed interorganizational processes. A new paradigm of partnership may be emerging with EDI as an important enabler.

Electronic Commerce came into widespread use within the past three years in recognition of the broader role technology can play in all aspects of trade and commerce. In particular, with the development of the World Wide Web, and its very rapid growth, new opportunities for conducting business are emerging. The final shape of the world of electronic commerce is as yet unclear, but it is clear that the path towards it is filled with both opportunities and threats.

In an attempt to develop a sharper focus on the world of electronic commerce, this course will examine the world of EDI through readings, case studies and field trips. Next, some of the newer elements of electronic commerce will be explored, including the World Wide Web, commercial on-line services, and Tradepoints. Ways in which leading edge companies are using these resources will be examined.

Finally, students will undertake a project related to electronic commerce in collaboration with either a company in the local business community or with a graduate student from another country.

Date	Topic	Readings
Jun 13	Introduction/Overview	RTC Ch 1
Jun 15	Structure and Syntax	RTC Ch 2
Jun 20	Field Trip: EDI Roundtable	
Jun 22	The Business Model and Business Need Guest Speaker: The Business Model Approach	RTC Ch 3
Jun 27	EDI Standards; Guest Speaker: EDI Standards	RTC Ch 4
Jun 29	EDI Software and Communications; Guest Speaker: The Role of VANs	RTC Ch 5
Jul 6	Begin Projects	
Jul 11	Field Trip: Gates Rubber Company	
Jul 13	Project Work	
Jul 18	Commerce on the World Wide Web; Lab Exercise	Web site
Jul 20	Project Work	
Jul 27	Project Progress Meetings	
Aug 1	Project Work	
Aug 3	Guest Speaker: CALS	Web site
Aug 8	Electronic Markets; Tradepoints; Quiz	Web site

GRADING

Grades will be determined approximately as follows:

Class Project	60%
Class Participation	20
Quiz	20

n.b. Web site readings chosen based upon what is current and relevant at the time.

APPENDIX II

SYLLABUS MIS 4310 – SUMMER 1998 ELECTRONIC COMMERCE

TEXT

Kalakota and Whinston “Frontiers of Electronic Commerce” Addison Wesley, 1996.

READINGS

“Intermediaries and Cybermediaries: A Continuing Role for Mediating Players in the Electronic Marketplace,” *Journal of Computer Mediated Communication*, Vol. 1, No. 3, 1995.

COURSE DESCRIPTION

EDI has been in use for over twenty-five years. Beginning with proprietary standards established by large “hub” companies and forced upon their smaller suppliers, EDI evolved to industry standards, national standards and now international standards. The pace of adoption has been slower than what might have been anticipated, given the demonstrated benefits EDI can deliver. Recently, however, more companies are adopting EDI in order to obtain the

benefits of transformed interorganizational processes. A new paradigm of partnership may be emerging with EDI as an important enabler.

Electronic Commerce came into widespread use within the past three years in recognition of the broader role technology can play in all aspects of trade and commerce. In particular, with the development of the World Wide Web and its very rapid growth, new opportunities for conducting business are emerging. The final shape of the world of electronic commerce is as yet unclear, but what is clear is that the path toward it is filled with both opportunities and threats.

In an attempt to develop a sharper focus on the world of electronic commerce, this course will examine all aspects of it utilizing through readings, case studies, guest speakers and field trips. Ways in which leading edge companies, both large and small, are using these resources will be examined.

Finally, students will undertake a research project related to electronic commerce, possibly in collaboration with a company in the local business community.

Date	Topic	Readings
Jun 15	Introduction: A Model of Electronic Commerce	K&W Ch 1
Jun 17	The Network Infrastructure for Electronic Commerce	K&W Ch 2
	The Internet as a Network Infrastructure	K&W Ch 3
	The Internet Protocol Suite	K&W Ch 17
Jun 22	Interorganizational Commerce and EDI	K&W Ch 9
	Value-added Networks	K&W Ch 10
	In-class workshop. Select Projects.	Web sites
Jun 24	Guest Speaker: EDI Realities for SMEs	
Jun 29	Field Trip: EDI at the Gates Rubber Company	
Jul 1	Next-Generation EDI Frameworks;	Web sites
	CALSCase: Requisite Technology	
Jul 6	Electronic Commerce and the World Wide Web	K&W Ch 6
	Consumer-Oriented Electronic Commerce	K&W Ch 7
	Lab Session	Web sites
Jul 8	The Business of Internet Commercialization	K&W Ch 4
	Broadband Telecommunications	K&W Ch 19
	Guest Speaker: The ISP Business	
Jul 13	Advertising and Marketing on the Internet	K&W Ch 13
	Case: Virtual Vineyards	Web sites

	Hand out take home quiz	
Jul 15	Guests: Two Electronic Commerce Start-ups	Web sites
Jul 20	Network Security and Firewalls – Guest Speaker	K&W Ch 5
	Take home quiz due	Web sites
Jul 22	Intraorganizational Electronic Commerce	K&W Ch 11
	The Corporate Digital Library	K&W Ch 12
	Field Trip: Intranets at Johns-Manville	
Jul 27	No Class. Individual work sessions on projects	
Jul 29	Guest Speaker: Electronic Payment Systems	Web sites
Aug 3	Electronic Payment Systems	K&W Ch 8
	Case: Mondex	
	Hand out second take home quiz	
Aug 5	Consumer Search and Resource Discovery	K&W Ch 14
	On-Demand Education and Digital Copyrights	K&W Ch 15
	Software Agents: Lab Session – “Kasbah”	K&W Ch 16 ; Web sites
Aug 10	Project Presentations	
Aug 12	Project Presentations	
	Project Papers Due	
	Second Take home quiz due.	

GRADING

Grades will be determined approximately as follows:

Class Participation	15%
Quizzes	25%
Cases	25%
Project	35%

n.b. Web site readings chosen based upon what is current and relevant at the time.

APPENDIX III

COURSES FOR THE MBA SPECIALIZATION IN ELECTRONIC COMMERCE

The following paragraphs describe the courses required for the MBA specialization in Electronic Commerce, in addition to the MBA Core.

ELECTRONIC COMMERCE

Overview of Electronic Commerce (EC) trends and techniques including the underlying technical infrastructure, traditional EC techniques such as electronic data interchange (EDI) and commerce at light speed (CALS), using the Internet for EC, business models for business-to-business and business-to-consumer EC, marketing on the Internet, payment and fulfillment mechanisms, security and regulatory issues, and global implications. Uses lectures, cases, outside speakers from industry, and field trips.

DATA BASE MANAGEMENT SYSTEMS

This course covers database concepts, database architecture, data modeling, data dictionaries, database administration, data security, and SQL (Structured Query Language). Using Oracle and Developer 2000, students are introduced to basic client-server database operations. Each student is also be responsible for creating a small database.

SYSTEMS ANALYSIS AND DESIGN

The course covers current theory and approaches to information systems analysis and design with an emphasis on object oriented concepts. Tools used include Oracle and Designer/2000. Topics include problem definition, classes and objects, object association and behavior, development of functional and technical specifications, cost/benefit analysis and implementation planning. A systems analysis and design project is an integral part of the course.

MARKETING RESEARCH AND INFORMATION MANAGEMENT

Research design and data analysis. Application of marketing research methodology to marketing decision-making.

MARKETING ON AN EC ENVIRONMENT

Design of sales and marketing programs for an EC environment, including business-to-business and business-to-consumer environments. Examination of successful business models which have incorporated mass customization, disintermediation, and global reach. Products, services and information-based marketing strategies will be examined.

APPENDIX IV

INFORMATION SYSTEMS COURSES FOR THE MS SPECIALIZATION IN ELECTRONIC COMMERCE

The following paragraphs describe the five information systems courses required for the MS in Information Technology for students taking the EC track.

FOUNDATIONS OF INFORMATION SYSTEMS

Examination of the information technology function within organizations and how non-technical managers can effectively use these resources to gain competitive advantage for their organizational units. Focuses on a management perspective of current and emerging information technologies and their effective use in solving business problems. Effective use of outside resources (e.g., consultants, outsourcing organizations) is also covered.

SOFTWARE ENGINEERING – I

This course serves as an introduction to software engineering in an object-oriented programming environment. Students are introduced to the Java

programming language and fundamental Java programming structures. Underlying concepts of the object-oriented paradigm are covered, including objects, classes, and inheritance. Students also analyze, design, code and debug a small system.

SOFTWARE ENGINEERING – II

A continuation of Software Engineering – I, this course covers systems development in a client-server Internet/Intranet environment using the Java programming language and SQL. Principles of event-driven systems, remote data base access, and building GUI (Graphical User Interface) prototypes for interfacing with desktop systems are included.

NETWORKS AND TELECOMMUNICATIONS

Examination of network-enabling technologies and concepts, including LANs and WANs. Network design, management and trouble-shooting issues are covered. Network design in the age of the Internet is emphasized, including Intranets, extranets, design issues, security and firewalls. Pros and cons of private networks, including virtual private networks are discussed. Alternative technologies such as wireline, wireless, satellite and cable are covered.

PRACTICUM/PROJECT MANAGEMENT

This course consists of an IS project, performed by small teams of students, and tailored to individual students' needs, performed for a "client" in the business community. Supervised by a faculty member, each project permit sstudents to apply what they have learned in a live setting and also focus on project management planning, reporting and problem discovery and resolution.

APPENDIX V

INFORMATION SYSTEMS COURSES FOR THE BUSINESS INFORMATION TECHNOLOGY TRACK

The following paragraphs describe the Corporate Information systems Management and Enterprise Systems courses required of students following the Business Information Technology Track.

CORPORATE INFORMATION SYSTEMS MANAGEMENT

Leading edge management issues and the management of emerging technologies are covered from the perspectives of the chief information officer, functional management and the CEO. Management issues such as outsourcing, process reengineering, systems project management, software quality assurance, and strategic alignment are covered along with developments in telecommunications, networking, hardware, and software. Guest lecturers from industry are invited to address specific topics.

ENTERPRISE SYSTEMS

Enterprise Systems, often called enterprise software or enterprise resource planning (ERP) software, is increasingly being adopted, first by Fortune 2000 companies, and now by medium-sized and even smaller companies as a way to more effectively plan and control their operations. Enterprise Systems consist of modules for business functions such as manufacturing, sales and marketing, human resources, and accounting which is highly integrated. This course examines the characteristics of Enterprise Systems in detail and focus on effective techniques for selection and installation.

ABOUT THE AUTHOR

Don McCubbrey is Clinical Professor and Chair, Department of Information Technology and Electronic Commerce and Director of the Center for the Study of Electronic Commerce in the Daniels College of Business at the University of Denver. He joined the Daniels College faculty in 1984 after a career in information systems consulting with Andersen Consulting/Arthur Andersen & Co. Since then, he has concentrated his teaching and research in the areas of strategic information systems and electronic commerce. He is a board member and co-founder of both the Colorado Electronic Commerce Roundtable and the Colorado Software Association.

LIST OF ACRONYMS

AIAG	Automotive Industry Action Group
ANSI X12	American National Standards Institute
BIT	Business Information Technoogy
CALS	Computer Acquisition and Lifecycle Support
DCB	Daniels College of Business
DU	University of Denver
EC	Electronic Commerce
EDI	Electronic Data Interchange
ERP	Enterprise resource Planning
GUI	Graphical User Interface
HTML	Hypertext Markup Language
IOS	Interorganizational Systems
ITEC	Information Technology and Electronic Commerce
LAN	Local Are Network
MEMA	Motor Equipment Manufacturers Association
MIT	Massachusetts Institute of Technology
RBOC	Regional Bell Operating Company
RFQ	Request for Quotation

SIS	Strategic Information System
SME	Small and Medium-sized Enterprise
SQL	Structured Query Language
TCP/IP	Telecommunications Protocol/Internet Protocol
VAN	Value-Added Network
VMI	Vendor-Managed Inventory
XML	Extensible Markup Language

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