An Implementation of IS2002:
BSCIS'04 – Bentley College

Leslie J. Waguespack, Jr. Ph.D.
Computer Information Systems, Bentley College
Waltham, MA 02452, USA

Abstract

IS undergraduate curricula design remains a consummate challenge for business school faculty around the world. IS 2002 guides the way by providing philosophy, focus and discussion for curriculum designers attempting to provide the best possible preparation for IS graduates who will compete in a global marketplace. This paper briefly describes the result of applying the guidance of IS 2002 to the design of an actual IS curriculum at Bentley College, Massachusetts, USA. We describe the balance we attempt to strike between breadth and depth of technical and business education goals in our BSCIS'04.

Keywords: IS curriculum, curriculum design, IS 2002 implementation, computing program in a business college

1. INTRODUCTION

The BS degree in computer information systems (BSCIS'04) prepares graduates for careers as business professionals engaged in the design, implementation and management of business information systems in the 21st century. Building on Bentley College's rich foundation of general education and the comprehensive business common body of knowledge, BSCIS'04 fuses the learning of technologies and skills for building enterprise-scale information systems, business domain expertise, and professional soft skills preparing the graduate for entry level employment, life-long professional learning and career advancement. The CIS faculty is committed to maintaining Bentley's leadership in undergraduate CIS education and accomplishing the college's goal to reach the next, next level by integrating business and leading edge information technology education.

2. MOTIVATIONS FOR REDESIGNING THE BSCIS CURRICULUM

In the seven years since the implementation of the current program, BSCIS'96 (Waguespack 1996), several changes have occurred that converge to motivate the redesign of the program: challenges in the IT job market, changes in IT directions, and changes in Bentley College. The CIS faculty is also applying lessons learned from the BSCIS'96 implementation. The first class of BSCIS'04 will enter the job market in 2006.

Challenges in the Job Market

The U.S. Department of Commerce projects 2.2 million new jobs for IT professionals in the next decade (US DOC 2003). And, although many new IT jobs are springing up offshore (some of which will displace domestic positions in the U.S.) the long-term employment prospects for IT seem strong. Regardless, the job market facing CIS graduates in the next 5 to 10 years will be challenging.

Today's CIS graduates face a more competitive environment filled with displaced IT workers who, although they may have entered the IT arena with limited formal preparation, nonetheless, now they swell the ranks of job seekers and have resumés with practical experience.

Challenge identified by the U.S. Department of Commerce …

To meet the challenge …

"Specific technical skills often lose their value over time, sometimes in as little as 2 or 3 years. This means that IT workers must acquire new skills frequently in order to maintain their labor market viability and upward mobility." (US DOC 2003– item 10)

CIS graduates must be prepared to be life-long learners.

"Experience is a high, if not the highest, priority in employer hiring considerations. … This view is reflected in the high priority IT workers place on learning IT in a real workplace, with real projects and problems, through hands-on, on-the-job training." (US DOC 2003– item 14)

CIS graduates need experience with industrial-quality tools on realistic hands-on projects.

Although employers are "… willing to hire individuals without bachelor's degrees (two-year degrees or certificates) for [support positions], further formal post-secondary education or even a four-year degree would typically be needed for advancement in the field, especially to IT management." (US DOC 2003– item 8)

CIS coursework must integrate with the general education and business core curricula.

"Today, IT is central to nearly all core business functions and to the overall operation of most companies and IT professionals are integral to the core business team. Accordingly, 'soft skills' (e.g., interpersonal skills, oral and written communications, teamwork, problem solving, and critical thinking) and business skills (e.g., needs analysis, project management, client/customer relations, understanding company financial information, and cost-benefit analysis), which have for many years been important to the advancement of non-technical professional workers, have become increasingly important for IT workers as well." (US DOC 2003– item 17)

CIS graduates must be business professionals as well as IT professionals.

Employers are carefully recruiting the "whole package," problem solvers who can communicate clearly and professionally both orally and in writing, who understand business organization and practices, who are skilled in state-of-the-art technologies and who understand the underlying computing theory enabling them to gather and employ emerging technologies to achieve business goals and objectives.

Changes in the IT Environment

In the past seven years, information systems have moved steadily toward enterprise-wide, network enabled business function integration. That move has been enabled and sustained by the Internet-based communications infrastructure and object oriented software design and development technologies. Object orientation is displacing structured analysis and design and entity relationship modeling as the driving paradigm for systems analysis and design. Where the primary role of the web used to be publishing information, the web is now becoming the main means of delivering business applications – applications integrated with database systems providing business-reach not only company-wide but worldwide.

Changes in Bentley College

Seven years ago at Bentley College one would have to look to the CIS department to find information technology taught as a lever for competitive advantage or as an enabler of business strategy. Today, Bentley has

become a "business university," where the impact of IT on business practice is part of every business curriculum. Every business student in his or her discipline studies the impact of IT. It is integrated in the business core and in their major courses of accountancy, management, finance, or marketing. The responsibility of *evangelist* for IT in business is now shared by all of CIS's sibling departments. Bentley College has supported an aggressive faculty recruitment program resulting in a stronger breadth and depth of technical, managerial and policy expertise in the CIS department. The CIS department can now turn its focus to moving to the *next level* in CIS education at Bentley – a next level that prepares CIS graduates to exploit the opportunities of global connectivity and information systems that integrate seamlessly with corporate business models.

Lessons Learned in BSCIS'96

In 1996, the CIS department made a conscious effort to expand the flexibility of the BSCIS. Programming theory and practice were concentrated in six credit hours with an additional 1.5 credit hours in applied database programming.

As it was the dawn of the web-programming era, the curriculum included several web development options utilizing HTML, JSP, ASP, and VBScript tools. Although rich in their diversity, the full potential of the learning experience in these courses was seldom realized. This was primarily due to the prerequisite structure, which often resulted in classes with a great imbalance in student preparedness for the course material. Compounding the situation was the modification college-wide in the class meetings of 1.5 credit hours courses that resulted in seven-week courses often meeting only 5 weeks effectively – further limiting the learning opportunity. As rich as were the range of options, few were required and any individual CIS graduate could not be guaranteed to have proficiency in any particular development tool or methodology.

The prerequisite structure also had the unintended effect of delaying student learning of theory and practice vital to the capstone applied software projects course. Student teams in this course usually included individuals who were not proficient in analysis, programming or database as they had not yet completed coursework in those areas.

In 1996, object-orientation was not the imperative paradigm for systems development that it has become today. In that program, object-orientation was available as an elective but students often did not study it early enough to impact their learning in related areas.

3. LEARNING OUTCOMES AND CURRICULAR RESOURCES

The BSCIS'04 curriculum described herein is the CIS faculty's encapsulation of the essential theory and professional practice necessary for every successful business professional involved in the design, implemen-

tation and management of business information systems in the 21st century.

Consistent with the IS 2002 model curriculum (IS2002), we envision the 21st century business information systems professionals as leaders in business in a global economy, who combine their communication, creative and reflective strengths of the arts and sciences with the analytical, technological and problem solving strengths of business. (See Figure 1 below.)
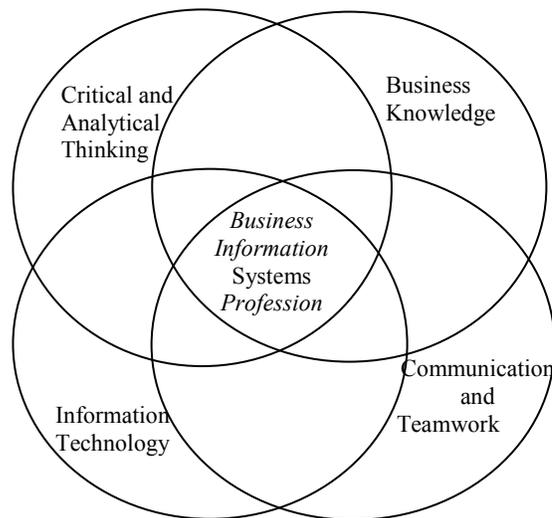
Figure 1 - BSCIS'04 Professional Preparation Dimensions

As a four-year bachelor's degree in business, the BSCIS'04 incorporates the breadth and depth of general education and core business education that support all of the AACSB accredited business programs at Bentley College. Section 4 below describes the IT components of the BSCIS'04 while Section 5 describes the general education and business core contributions to the BSCIS'04 program.

4. INFORMATION TECHNOLOGY EDUCATION

CIS's special task in the professional formation of BSCIS graduates is the careful selection of theory and practice in the information technology domain. We select theory and practice that may be fused with learning in the areas of business knowledge, critical and analytical thinking, and communication and teamwork.

The selection of theory and professional practice in information technology draws from four essential domains: 1) programming and software development, 2) data modeling and database management, 3) systems development, modeling and design, and 4) net-centric computing. A fifth focus area, integrative initiatives, attempts to exploit the synergies among the four areas to reinforce the students' grasp of systems thinking and more fully extend the information technology experi-

ence into the business application domain. (See Figure 2 below.)
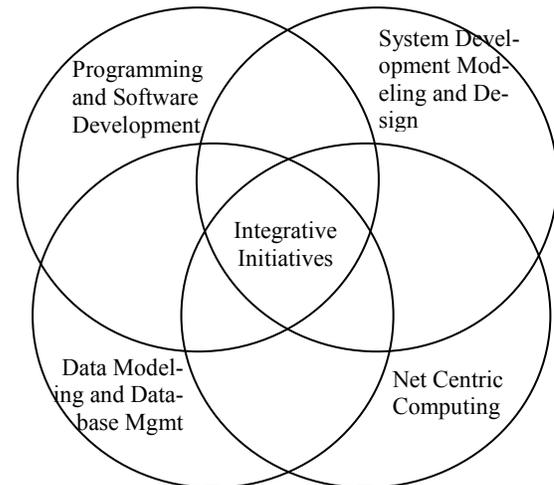
Figure 2 - BSCIS'04 Information Technology Learning Tracks

This section defines the focus of each of the learning tracks depicted above. In Table 1 that follows, the courses in the BSCIS'04 curriculum are indicated by track and learning level. Learning level corresponds to the degree with which the course material is integrated with professional practice.

Programming and Software Development

Business application systems in the 21st century require programming and software development, systems integration, and configuration management on the web supporting e-commerce and enterprise-wide decision support activities. BSCIS graduates need fluency in web-based applications and the object oriented technologies that enable them. BSCIS graduates need practical experience in designing, programming, configuring and supporting web-based systems.

Data Modeling and Database Management

Database and data management are at the core of business processes. Data modeling and database programming theory and skills are essential. Well-developed analytical skills for defining data representation and relationships as well as presentation skills for transactions and reporting are key to business application effectiveness.

System Development, Modeling and Design

IT support for business systems begins with business requirements analysis, problem description, and project management. BSCIS graduates need fluency with system modeling and project management methods and tools to assure efficient and effective communication with stakeholders as well as team members. In this 21st century, object oriented methods and tools form the foundation in this area also.

Net-Centric Computing

Business information systems are increasingly dependent upon computer networking, whether locally in the workplace or globally through the web. Reliability, capacity, availability, and serviceability of the computer and networking systems that underpin most business systems require careful consideration throughout the systems development process. BSCIS graduates need to understand the opportunities and constraints that computer and network infrastructure represent to the business systems designer and developer.

Integrative Initiatives

Finally, but perhaps most importantly, BSCIS graduates are systems thinkers. Immersed in the business domain learning provided by the business common body of knowledge, BSCIS graduates are taught to seek information solutions that align with the business model to support business goals and objectives. IT is a tool that finds its most effective use when it supports that alignment. The following, Table 1, summarizes the BSCIS'04 course offerings categorized by learning track and level of learning outcome.

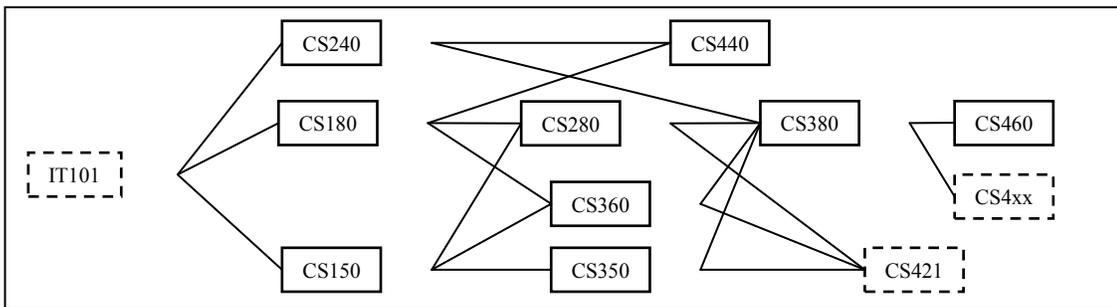| **BSCIS'04**	*Programming and Software Development*	*Data Modeling and Database Management*	*System Development, Modeling and Design*	*Net-Centric Computing*
Introductory	**CS180** Programming Fundamentals	**CS150** Introduction to Data and Information Management		
Theoretical	**CS280** Object-Oriented Application Development	**CS350** Database Management Systems	**CS360** Business Systems Analysis and Modeling	**CS240** Business Processing and Communications Infrastructure
Technical	**CS380** Multi-tiered Application Development			
Professional			**CS460** IS Project Management and Practice	**CS440** Advanced Net-Centric Computing

Table 1 - BSCIS'04 Major Course Offerings

Figure 3 – BSCIS'04 Course Prerequisite Structure

	Critical and Analytical Thinking / Problem Solving	*Business Knowledge*	*Communication and Team Work*
General Education Core:	Microeconomics Macroeconomics Mathematical Sciences I and II Philosophy		Expository Writing Literature
Business Common Body of Knowledge:	GB201 Financial Reporting and Analysis GB202 Accounting Information for Decision-Making GB204 Data Analysis GB205 Quantitative Analysis for Business Decisions	GB101 World of Business GB201 Financial Reporting and Analysis GB202 Accounting Information for Decision-Making GB203 Information Support Systems in Business GB301 Integrated Business Functions GB401 Strategic Management	GB102 Managing Teams GB301 Integrated Business Functions
Examples of Electives:	LA109 Law and Ethics for Cyber society MA239 Linear Algebra MA243 Discrete Probability MA252 Mathematical Statistics PH111 Introduction to Logic PH130 Business Ethics: Corporate Social Responsibility PH131 Business Ethics: Philosophy of Work PH133 Business Ethics: International Business Ethics PH135 Special Problems in Business and Professional Ethics PH251 Ethics PH252 Theories of Knowledge EC361 Introduction to Econometrics *Modern language courses* *Catalog descriptions of these courses may be found at* *www.bentley.edu/undergraduate*	Any elective course in business disciplines LA300 Cyber law	COM210 Effective Speaking COM323 Small Group Communication COM324 Design as Communication IDCC230 Fundamentals of Content Development IDCC240 Fundamentals of Visual Communication IDCC320 Managerial Communication IDCC360 Public Relations and Information Technology IDCC370 Web Design I: Information Design, Principles and Practices IDCC380 Web Design II: Information Architecture and Site Management INT104 Introduction to Cross-Cultural Understanding MG240 Interpersonal Relations in Management MG241 Leadership, Power and Politics in Organizations MG342 Managing Technology-based Organizations MG343 Project Management MG380 Negotiating PS311 Social Psychology

Table 2 - General Education and Business Common Body of Knowledge Content

5. GENERAL EDUCATION AND BUSINESS FOUNDATION

The BSCIS'04 program relies heavily upon the foundation of the general education core and business common body of knowledge. A brief survey of these curricula illustrates the breadth and depth of their foundation. (See table 2 above.)

6. JOB TITLES AND BSCIS'04

The traditional job titles in information systems (i.e. systems analyst, programmer, data base administrator, systems architect, etc.) have been joined in the last decade or so by a myriad of hybrid titles (e.g. requirements analyst, business analyst, systems programmer, applications programmer, web designer, web programmer, web site administrator, software engineer, database analyst, database programmer, data administrator, network administrator, network architect, modeler, OO class de-

signer, OO class architect, component configuration manager, etc.) all of which are found modified by a specific technology adjective in the job listings (e.g. Java, C++, Oracle, VB, ASP, .NET, UML, XML, HTML, MS Access, etc., etc.). Along with these jobs/titles have emerged a wholly new category of IT jobs called "support" (e.g. desktop support, customer support, network support, system support, etc.).

{This latter group of IT support job titles has actually spawned a new category of curricula in 2-year and 4-year schools called "IT." These programs focus on using particular "brand name" technologies but include limited (if any) theory or problem domain content.}

Despite the apparent confusion in the job market, there is little confusion about the core capabilities that information system professionals must possess to be successful in the rapidly changing technology and economic landscape.

Employers are looking for _problem solvers who possess a deep familiarity with a problem domain and a command of applicable technology_.

Problem Solvers

The BSCIS curriculum instills and develops quantitative and qualitative analytical skills. Specific pedagogy is found in the general education, business common body of knowledge and BSCIS major courses. Students are trained in both individual and group situations with pedagogy focused on oral and written communication and effective team dynamics.

In the BSCIS major, the three courses of the programming sequence impart the fundamentals of attention to technical detail, process analysis, problem decomposition, solution composition and solution testing. The two courses of the data management sequence focus on representing real world situations as stored information that can be analyzed, manipulated and tested. These problem-solving skills underpin every professional practice exercise whether in data management, e-commerce application development, infrastructure design or project management.

Problem Domain

The primary problem domain of IS professionals is *systems*. Systems frame human experience: social, economic, scientific, political, physical, etc. Bentley College's frame of reference is the business domain. The BSCIS major includes 30 course credit hours of business education in the common body of knowledge that provides the BSCIS graduate with a deep familiarity with business process and vocabulary. This rich preparation in domain knowledge clearly distinguishes the CIS graduate from graduates of either CS or IT programs.

Applicable Technology

The rapid evolution of computing technology and practice presents a daunting challenge for curriculum designers. The BSCIS program chooses to focus on system development in the object oriented paradigm, the emerging backbone of business infrastructure, the Inter-

net, and the foundation of business decision-making, data management. The fusion of these technologies defines the future of information systems in the 21st century. To the extent possible, learning these technologies is melded with the problem solving and problem-domain commitments already described. The result is a merging of problem description and solution composition frameworks that streamlines both the pedagogy and the toolset of the CIS graduate.

BSCIS'04 graduates will be prepared to assume *entry-level* professional positions with any of the following job titles *(as in all cases, site-specific on-the-job technology training will be appropriate)*:

Traditional:
systems analyst,
programmer,
data base administrator,
systems architect,

Organizationally Specific:
requirements analyst,
business analyst,
systems programmer,
      {May require careful selection of additional advanced technology elective(s)}
applications programmer,

Technology Specific
web designer,
web programmer,
web site administrator,
software engineer,
database analyst,
database programmer,
data administrator,
network administrator,
network architect,
modeler,
OO class designer,
OO class architect,
component configuration manager,

Function Specific:
desktop support,
customer support,
network support,
system support

7. PROGRAM STRUCTURE RATIONALE

The program has four main thrusts: systems, data management, software development, and net-centric computing (as described in Table 1). We choose to emphasize hands-on IT / IS capabilities in light of the growing emphasis in the job market for relevant, technical skills while attempting at the same time to preserve (in a nine course program) the theoretical foundations that enable life-long learning and career growth. (See figure 3 above for prerequisite structure.)

In a sense, we are attempting to optimize the learning potential in each of the required courses. There is a tight prerequisite structure homogenizing the student preparation for each course. This assures that every student entering a course has virtually identical preparation and experience within the program. It also has the administrative side-benefit of improving the predictability of registration numbers. The program is roughly divided into four levels of study: introductory, theoretical, technical, and professional. At each level the integration of the course material with professional practice is increased.

Introductory Level

This level is composed of Introduction to Data and Information Management, CS150, and Programming Foundations, CS180. These are "zero-based" introductions to building computer software to solve problems. The courses are numbered to encourage registration by sophomores. IT101 is the common general education IT prerequisite required of all undergraduates. The presence of two distinctive choices for a "first taste" of the CIS major is intended to appeal to a larger student population. At best students will be inspired by both these courses and hopefully, at worst, one will capture their imagination if the other doesn't.

CS150 Introduction to Data and Information Management: CS150 draws upon the model of data management pedagogy currently in use for the IT minor. Although students receive a healthy dose of relational database theory in this introductory course, the use of a high-level development tool such as MS Access™ permits first course students to produce gratifying computer applications and tempers the theoretical rigor with a sense of practical accomplishment. Students are able to solve basic business data problems by building working applications after completing only one CIS course.

CS180 Programming Fundamentals: This course derives from the introductory programming standard, CS1 and CS2, ascribed to in both the national curricula for computer science and IS. It is the first of a three-course sequence to prepare students to build commercial-strength software with programming languages, development environments and software engineering tools. It also begins the students' program-long immersion in object-oriented technology. This course lays the foundation of programming principles that will be assumed when students advance to building systems using objects. As the first of three courses that share the responsibility of teaching students how to program business applications, this course attempts to present a more accessible introduction than the two-course model of BSCIS'96. The development skill set imparted by the three-course software development suite is at the heart of the competitive advantage that CIS graduates achieve. It is a rigorous and challenging course of study. Extending this suite over three courses is calculated to soften the "first course" learning experience by relaxing the learning curve.

Theoretical Level

This level presents the foundation computer and systems theory that expands the students' grasp of computing from the individual application to the business or enterprise breadth of systems. It introduces the concepts of computer systems and software from a business perspective and prepares students to make cost benefit assessments of individual technology or development choices in the broader context of system benefits. The courses are numbered to encourage students to register for them between the first semester of the sophomore year and the second semester of the junior year.

CS240 Business Processing and Communications Infrastructure: CS240 draws on a rich experience of CS220 and CS340 in CIS at Bentley. CS240 introduces computer hardware structures to de-mystify the internal functioning of computer equipment and to help students develop a sense of layered architecture in systems. Basic concepts of number and value representation begin to provide an understanding of storage capacity and relative performance issues. Basic understanding of processes and computer control structures underpin the concepts of control-flow, event handing, and transaction processing that will be seminal to enterprise systems design and implementation. CS240 also presents a seamless intersection of computation and communication as it integrates the technology of inter-process and Internet communications. This fusion of computer structure and networking concepts prepares the student to make capacity and performance assessments on an application, system and enterprise scale.

The IT101 prerequisite assures an appropriate level of computer fluency for computer-based exercises and technology demonstrations.

CS280 Object-Oriented Application Development: This course is the second in the three-course application development sequence. Where CS180 introduces programming concepts that are largely ubiquitous across all programming paradigms, CS280 delves heavily into the object-oriented paradigm and specifically its implementation in a particular programming language (Java). Students are introduced to class libraries and component structures. They progress to designing and implementing their own class structures to construct completed business applications. CS280 extends the introduction of OO concepts in CS180 to the full use of OO terminology and concepts based in an object oriented programming language.

CS180 is a prerequisite as it introduces basic programming concepts and object-oriented terminology necessary to understand the initial CS280 material. CS150 is a prerequisite contributing basic data organization concepts (sorting and searching) along with systems analysis concepts of requirements-based data type selec-

tion and definition. CS150 also provides experience in interface and transaction design.

CS350 Database Management Systems: CS350 continues the exploration of data management with deeper theoretical and practice treatment of the relational data model. Central to this treatment is a comprehensive coverage of SQL and the variety of data access mechanisms that are based upon it (e.g. ODBC, JDBC, etc.). Formal business systems analysis and design methods are applied to database design and testing, integrity constraints, and security issues. Logical versus physical database design issues are addressed. Concepts of data distribution, redundancy, and recovery round out a discussion of database administration and information asset management. The course offers the student the opportunity to expand their application development skills to include MS Access™ to Oracle database connectivity, which introduces distributed database topics. Where CS150 focuses more often on single user data resources, CS350 expands to multi-user access, transaction processing, and distributed computing.

CS150 is prerequisite to CS350 as it introduces the basic terminology and technology of database that is assumed in CS350.

CS360 Business Systems Analysis and Modeling: This course is classic in its coverage of business systems issues: requirements analysis, systems analysis, cost/benefit analysis, technology assessment and selection, systems design, software project documentation, and Pert/critical path method. However, all these systems activities are accomplished in the object-oriented paradigm. UML is the lingua franca of this course and systems documentation will revolve around standard UML diagrams: use case, class, sequence, and activity. Where CS180-CS280 converse in the Java dialect of objects, CS360 is programming language independent.

CS150 is prerequisite to CS360 as it provides basic data modeling concepts and user interaction experience to the incoming student. CS180 is prerequisite to support the object-orientation.

Technical Level

This level is the technical culmination of the required CIS curriculum. The single course in this level is intended to fuse all the theoretical concepts developed up to this point in the students' learning and extend their professional capabilities using advanced business system technologies and software engineering tools. Students are challenged to combine their systems, programming, data management and net-centric knowledge in individual development projects to build professional quality multi-user, database accessing application systems. This course is numbered to encourage registration between the first-semester of the junior year to the first semester of the senior year.

CS380 Multi-tiered Application Development: CS380 gathers the preparation of the theoretical level in the program permitting each student to build a significant application product. The product integrates technologies and methods developed in the four prerequisite courses. Students are encouraged to stretch by incorporating additional new technologies that they assimilate during the course. The course is a significant technology and systems integration exercise.

CS380 requires CS240, CS280, CS350 and CS360 as prerequisites. These courses comprise the technology and methodology resources to be incorporated and integrated in CS380.

Professional Level

This level of CIS coursework is called professional both because of the topics and issues covered and because the student is on the threshold of their professional life. These courses represent the cutting edge of the CIS graduates' competitive edge in the job market as well as the capstone of their academic preparation to be a business, information systems professional. The professional level consists of two required courses (If a student has not exhausted their business or unrestricted electives they may choose more than the required 9 courses in the CIS major. This is their choice. The 50% rule of Arts & Sciences vs. Business courses currently remains in effect at Bentley although AACSB has rescinded this requirement from the national guidelines for business majors.) The electives provide students the opportunity to hone their competitive edge, their CIS experience at Bentley – to position themselves for a specific job market or opportunity. It may be a broadening of perspective on emerging technology or practical experience in industry as an intern.

CS440 Advanced Net-Centric Computing: More advanced topics concerning communications (e.g. wireless, protocol evolution, trans-national law and policy, …) and computer systems architecture are important topics that will impact the evolution and distribution of information. CS440 is the opportunity to extend the introductory material of CS240 and address the broader range of networking and communications issues and systems software topics.

CS180 and CS240 are the prerequisites as they introduced the domain of computation and terminology of computer systems and communications structures.

CS460 IS Project Management and Practice: CS460 is the capstone course in the CIS program. Where students have worked on individual projects or in teams on learning assignments in prior courses that focused on technology, this course focuses on the conduct of a team project covering a complete system life cycle. Schedules, meetings, deadlines, work breakdowns, risk and crisis management, written and oral team communication, and customer and contract management all converge as students attempt to integrate their general education, business core, and CIS coursework to "test drive" their professional skills and attitude. In relatively large teams, members experience practical and inevita-

ble project surprises and learn to recognize and manage them.

CS380 is the prerequisite for CS460. In CS380 students have demonstrated their individual command of technology and they bring that to their CS460 group project experience.

CS4xx Advanced Net-Centric Technology: This elective represents perhaps more than one elective. There are emerging technologies (VB.NET and J2EE among them), which may be particularly advantageous in the job market. This placeholder permits special topics or emerging areas of importance to be addressed quickly in the curriculum approval cycle.

CS421 Information Systems Internship: Despite the fact that CIS graduates are "college graduates," many lack practical work experience and are at a disadvantage in the job market. As the U.S. Department of Commerce reports, work experience is a key factor in employer hiring decisions. The CIS internship enables students to get industry experience in the course of their academic program. Limited by academic standing requirements, CIS interns also serve as a key liaison between the CIS department and the critical employer market we serve. The flow of experience back and forth helps keep our faculty attuned to the industry needs and trends.

8. SUMMARY

As the line blurs between technical expert and business information manager, IS professional preparation continues to be a challenging and difficult task for curriculum designers. The program described above attempts to exploit to the fullest extent the business and practical information education provided in the general education and common business body of knowledge offered by the sibling business departments. As such, the program described herein delves deeper into the implementation and project management domains of IS development than we have been able to achieve in the past. The demands of the ever-evolving job market and the continuing integration of information technology into business practice lead us this way.

9. ACKNOWLEDGEMENTS

This CIS program results from the work of virtually every member of the CIS faculty at Bentley College. Track team volunteers spent dozens of hours reviewing the current program and assessing the direction of CIS / IS curricula to reach their recommendations for the courses and structure proposed here. No program results from the total and complete agreement of everyone on the structure, content or approach. This program is no different. There were compromises to meet the constraints of the enclosing Bentley general education and business curricula while honoring the design principles

that were set out. The author wishes to recognize and applaud the careful, frank and focused effort employed by all in reaching this final design.

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Author email: LWaguepack@Bentley.edu