BUSI 3402A
Systems Analysis and Design
Winter 2017

INSTRUCTOR: Dr. Shaobo Ji (shaobo.ji@carleton.ca)
OFFICE: 1721 Dunton Tower
TELEPHONE: 613-520-2600 x. 5751
OFFICE HOUR: by appointment

TA: TBD

CLASS TIME/ROOM:

Date and Time: 6:05 – 8:55pm (Tuesdays)
Location: UC282
(Note: first class meets on Tuesday, January 10, 2017; last class is April 4, 2017)

LAB TIME/ROOM:

Online lab/tutorial will be made available through cuLearn.

COURSE DESCRIPTION, LEARNING OBJECCTIVES AND TOPIC[1]

Description

This course focuses on the processes, methods, techniques and tools that organizations use to determine how they should conduct their business, with a particular focus on how computer-based technologies can most effectively contribute to the way business is organized. The course covers a systematic methodology for analyzing a business problem or opportunity, determining what role, if any, computer-based technologies can play in addressing the business need, articulating business requirements for the technology solution, specifying alternative approaches to acquiring the technology capabilities needed to address the business requirements, and specifying the requirements for the information systems solution in particular, in-house development, development from third-party providers, or purchased commercial-off-the-shelf (COTS) packages.

Learning objectives

1. Understand the types of business needs that can be addressed using information technology-based solutions.
2. Initiate, specify, and prioritize information systems projects and to determine various aspects of feasibility of these projects.
3. Clearly define problems, opportunities, or mandates that initiate projects.
4. Use at least one specific methodology for analyzing a business situation (a problem or opportunity), modeling it using a formal technique, and specifying requirements for a system that enables a productive change in a way the business is conducted.
5. Within the context of the methodologies they learn, write clear and concise business requirements documents and convert them into technical specifications.
6. Communicate effectively with various organizational stakeholders to collect information using a variety of techniques and to convey proposed solution characteristics to them.
7. Manage information systems projects using formal project management methods.
8. Articulate various systems acquisition alternatives, including the use of packaged systems (such as ERP, CRM, SCM, etc.) and outsourced design and development resources.
9. Use contemporary CASE tools for the use in process and data modeling.
10. Compare the acquisition alternatives systematically.
11. Incorporate principles leading to high levels of security and user experience from the beginning of the systems development process.

[1] IS 2010 Curriculum Guidelines for Undergraduate Degree Programs in Information Systems, Association for Computing Machinery (ACM) and Association for Information Systems (AIS).

12. Design high-level logical system characteristics (user interface design, design of data and information requirements).
13. Analyze and articulate ethical, cultural, and legal issues and their feasibilities among alternative solutions.

Topics

1. Identification of opportunities for IT-enabled organizational change
2. Business process management
3. Analysis of business requirements
    a. Business process modeling
    b. Information requirements
4. Structuring of IT-based opportunities into projects
5. Project specification
6. Project prioritization
7. Analysis of project feasibility
    a. Operational
    b. Tangible costs and benefits (financial and other measures such as time savings)
    c. Intangible costs and benefits such as good will, company image
    d. Technical
    e. Schedule
    f. Legal
    g. Cultural (organizational and ethnic)
8. Fundamentals of IS project management in the global context
9. Using globally distributed communication and collaboration platforms
10. Analysis and specification of system requirements
    a. Data collection methods
    b. Methods for structuring and communicating requirements
    c. Factors affecting user experience
    d. User interface design
    e. System data requirements
    f. Factors affecting security
    g. Ethical considerations in requirements specification
11. Different approaches to implementing information systems to support business requirements
    a. Packaged systems; enterprise systems
    b. Outsourced development
    c. In-house development
12. Specifying implementation alternatives for a specific system
13. Impact of implementation alternatives on system requirements specification
14. Methods for comparing systems implementation approaches
15. Organizational implementation of a new information system
16. Different approaches to systems analysis & design: structured SDLC, unified process/UML, agile methods

COURSE REQUIREMENT AND SCOPE

Calendar description and prerequisites

BUSI 3402 [0.5 credit]
Systems Analysis and Design
Methods of analysis of computer-based information systems. The systems development life cycle, planning, analysis, design, implementation and maintenance. Structured and object-oriented methods will be used. Use of a CASE tool.
Precludes additional credit for SYSC 3100, BUSI 3403, (no longer offered) and BUSI 3404 (no longer offered).
Prerequisite(s): one of BUSI 2400, COMP 2404, or SYSC 2004 (with a grade of C or higher).
Lectures three hours and tutorials one hour a week.

Required Textbook

Title:	Systems Analysis and Design (October 2014, ©2015), 6th Ed.
Authors:	Alan Dennis, Barbara Haley Wixom, Roberta M. Roth
Publisher:	Wiley
ISBN:	978-1-118-89786-7 (E-text); 978-1-118-89784-3 (Paperback)
Website:	http://ca.wiley.com/WileyCDA/WileyTitle/productCd-EHEP003168.html

Additional cases (to be provided by the instructor through cuLearn)

1. Ji, S. - Online Electronic Thesis Support System at Maritime University (case) (a.k.a., the e-thesis submission system)
2. Ji, S. - Physical Plant IS requirements and asset management systems (case) (a.k.a., the Physical Plant asset management systems)

Lab and software

Objective and tool: Use system development tools, i.e., IBM's Rational® Requirements Management, WebSphere Business Modeler, Rational System Architect, Rational Software Modeler, IBM DB2, and MS SQL Server, MS Visio and MS Project, to support the information systems analysis and design process.

Note: Access to Rational software will be available to students registered in the course. Each student will be given access to the software. For MS Office Visio and Project software, please download from the following site: http://dreamspark.carleton.ca/.

Evaluation

1)	Class participation and in-class hands-on exercises	25%
2)	Individual assignments (5 @ 5%)	25%
3)	Group term project and presentation	25%
4)	Final examination	25%
	Total	100%

Class participation

The key to learn information systems analysis and design is to link classroom knowledge to practical application. Active participation in the classroom is very important in this course. You will be measured by your involvement in the in-class exercises (quantity and quality of your participation). Be prepared to respond to issues raised in class and bring questions and issues you encounter into the classroom.

Assignment and submission

There will be five (5) assignments. Individual assignments are due at the date and time indicated. Each assignment's file should be named properly and in the following format: busi3402_w17_assignment#_ LastName_CUID (e.g., busi3402_w17_assignment#1_Ji_100123456). Assignments must be submitted through cuLearn.

Group Term Project and Presentation

At the beginning of the term, students will form group of (max.) 5 for a term project. Bi-weekly project status report is expected of the teams. A final project report is due at the end of the term. Each team will be given 10-15 minutes to engage classmates about their projects. Presentations will be held in the last week of the course. At the end of the term, each student will be asked to complete a peer-review form for self and other team members. A numerical grade (out of 100) will be assigned to team's term project. Each team member's term project grade will be determined by the grade for the team and team member's peer reviews and evaluations.

Examination

Final examination will be scheduled by the university and to be held in April 2017.

Course Grade

Students must meet the in-term performance criteria as specified in this course outline in order to pass the course. The course grade is determined by the evaluation criteria and is subject to Dean's approval.

OUTLINE OF SCOPE AND CHARACTERISTICS OF THE COURSE

Although the course will cover all topics identified in the 2010 ACM/AIS Curriculum Guidelines different level of detailed discussions will be given among the topics to reflect the changing world, the materials included in the textbook, and other IS courses included in the IS concentration at the Sprott School of Business, with the following characteristics.

1. Perspective: Business and IT Enabled Business Processes
   The course covers processes, methods, techniques and tools that organizations use to determine how they should conduct their business, with a particular focus on how computer-based technologies can most effectively contribute to the way business is organized.
2. Methods: Structured vs. OO
   The course will provide some exposure to both structured SDLC, object-oriented analysis and design (some Unified Process variant using UML as a grammar) and agile methods. Although both structured and OO modeling methods will be covered in this course, emphasis will be more on the OO using UML.
3. Scope: Analysis and Design
   The focus of the course is on analyzing and documenting business requirements as well as converting these requirements into detailed systems requirements and high-level design specifications. (e.g., mock-ups of forms, reports, HCI, and so other user interface components), not on internal design or system implementation design.
4. Data and Database: Data Modeling and Database Design
   The focus will be on 1) business information and data requirement and its relationship with conceptual data modeling, and 2) resource (data) management perspective of IS architecture. Although we will discuss database modeling, the presentation and discussion will be brief and the focus will be on conceptual and logical level. Database modeling is better covered in another IS course, BUSI 3400, which is offered concurrently as this course.
5. Theory and Practice: Group Term Project and IS Analysis and Design Body of Knowledge (BOK)
   IS project management topics, understanding the business needs, and finding IT based solutions to business problems will be covered through in-class discussions and practiced through group term project. As an important and integral part of the course design, term project will serve as an important learning tool for students to relate the materials covered in the textbook and lectures with solving real world business problems with information technologies. The goal of the term project is to perform analysis and specification of system requirements and to investigate and identify different approaches to implementing information systems to support business requirements. Unlike another IS course, BUSI 4402 (Information Systems Practicum), actual development and implementation of the system is NOT required.
6. Organization and IT Solutions: Multiple Capabilities Acquisitions
   The course is based on the assumption that most organizational systems are built based on various types of packaged systems, system components, or implemented by using outsourced development capabilities (whether on- or off-shore).

7. The Role of BA/SA: A Communicator
   The course will cover methods that allow you to specify requirements precisely and communicate effectively with both business stakeholders and developers, but it will not include material related to the design or implementation of the technical structure of the system.
8. Traditional and Modern: Security, User Experience and Operational Issues
   The course emphasizes the importance of incorporating security issues, non-functional design, and user experience from the earliest stages of the IS Analysis and Design processes.

COURSE AGENDA AND SCHEDULE (Subject to Revision)

Week / Date	Topic	Reading

1. Jan. 10	• **Course administration (lab, grouping and evaluation)**
	• **Business needs and IT**
	• **Introduction to Systems Analysis and Design**
	  ○ System request and business case / SDLC
		• Textbook – Part One – Planning Phase
		  ○ Chapter 1 (the Systems Analyst and Information Systems Development)

2. Jan. 17	• **IS Project Management**
	  • Technical and Economical Feasibility Study
	• **Guest speaker (TBD)**
		• Case – Ji, Physical Plant asset management systems
		• Textbook – Part One – Planning Phase
		  ○ Chapter 1 (the Systems Analyst and Information Systems Development)
		• Assignment #1 is due.

3. Jan. 24	• **IS Project Management**
	  • IS project management body of knowledge
	  • Project plan
	  • Project methodology
	  • Project control and management
	  • Risk assessment
		• Textbook – Part One – Planning Phase
		  ○ Chapter 2 (Project Selection and Management)

4. Jan. 31	• **Analysis: system requirements determination**
	  • Analysis and specification of system requirements
	  • Data collection methods (story board)
	  • Factors affecting user experience
	  • System data requirements
	  • Factors affecting security
	  • Ethical considerations in requirements specification
		• Textbook – Part Two – Analysis Phase
		  ○ Chapter 3 (Requirements Determination)
		• Case – Ji, E-thesis submission system
		• Assignment #2 is due.

5. Feb. 7	• **Analysis: system requirement determination & structuring**
	  • Use case analysis
	  • Introduction to OO analysis and design
	  • Requirement structuring and documentation
		• Textbook – Part Two – Analysis Phase
		  ○ Chapter 4 (Requirements Determination)
		  ○ Chapter 14 (The movement to objects) pp. 427 – 443.

Week / Date	Topic	Reading

6. Feb. 14	• **Analysis: requirement structuring (process and data modeling)**
	  • Data flow diagram
	  • Sequence diagram
	  • Behavioral state machine diagram
	  • Entity Relationship Diagram
	  • Class diagram
		• Textbook – Part Two – Analysis Phase
		  ○ Chapter 5 (Process modeling)
		  ○ Chapter 6 (Data modeling)
		  ○ Chapter 14 (The movement to objects) pp. 444 – 458.
		• Assignment #3 is due.

Feb. 20-24	• **Winter reading break, no class**	• **No class / no lab**

7. Feb. 28	• **Design: introduction and system's architecture**
	  • Moving into design
	  • Architecture design
	• Non-functional design (operational, performance, security)
		• Textbook – Part Three – Design Phase
		  ○ Chapter 7 (Moving into Design)
		• Chapter 8 (Architecture design)

8. March 7	• **Design: interfaces and dialogues**
	  • System design and user experience
	  • Designing system interfaces
		• Textbook – Part Three – Design Phase
		  ○ Chapter 9 (User interface design)
		• Assignment #4 is due.

9. March 14	• **Design: program design and data storage design**
	  • Moving from logical to physical design
	  • Program design
	  • Data storage design
		• Textbook – Part Three – Design Phase
		  ○ Chapter 10 (Program design)
		  ○ Chapter 11 (Data storage design)

10. March 21	• **Implementation: programming, testing, documentation**
	  • Managing programming process
	  • Testing (planning and types)
	  • Documentation
		• Textbook – Part Four – Implementation Phase
		  ○ Chapter 12 (Moving into implementation)
		  ○ Chapter 13 (Transition to the new system)
		• Assignment #5 is due.

11. March 28	• **Course wrap-up and review** • A comprehensive case study	
12. April 6	• **Term project presentation**	

IMPORTANT ADDITIONAL INFOMRATION

FND:
To reduce instances of miscommunication Carleton introduced a grade FND (Failure with No Deferral) to be assigned to students who fail to meet the minimum in-term performance standards explicitly set out in the outline and applied consistently (i.e., there is no other hidden criteria).

Satisfactory In-term Performance

1. Unless otherwise stated below in item #2, the requirement for Satisfactory In-term Performance is set at 50% of all, not each, pre-final term work (i.e. assignments, participation marks, tests etc.).
2. The criterion/criteria and the standard(s) for Satisfactory In-term Performance are as follow(s):
    a. >=50% assignments
    b. >=50% class participation and in-term individual class performance
3. Unsatisfactory In-term Performance in this course will lead to failure in this course (regardless of the performance at the Final exam or final project) **Yes**☐
4. FND grade in this course (in case of missed Final exam or project) **Yes**☐

Course Sharing Websites
Student or professor materials created for this course (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

Required calculator in BUSI course examinations
If you are purchasing a calculator, we recommend any one of the following options: Texas Instruments BA II Plus (including Pro Model), Hewlett Packard HP 12C (including Platinum model), Staples Financial Calculator, Sharp EL-738C & Hewlett Packard HP 10bII

Group work
The Sprott School of Business encourages group assignments in the school for several reasons. They provide you with opportunities to develop and enhance interpersonal, communication, leadership, follower-ship and other group skills. Group assignments are also good for learning integrative skills for putting together a complex task. Your professor may assign one or more group tasks/assignments/projects in this course. Before embarking on a specific problem as a group, it is your responsibility to ensure that the problem is meant to be a group assignment and not an individual one.

In accordance with the Carleton University Undergraduate Calendar (p 34), the letter grades assigned in this course will have the following percentage equivalents:
A+ = 90-100 B+ = 77-79 C+ = 67-69 D+ = 57-59

A = 85-89	B = 73-76	C = 63-66	D = 53-56
A - = 80-84	B - = 70-72	C - = 60-62	D - = 50-52

F = Below 50
WDN = Withdrawn from the course
ABS = Student absent from final exam
DEF = Deferred (See above)
FND = (Failed, no Deferred) = Student could not pass the course even with 100% on final exam

Academic Regulations, Accommodations, etc.
University rules regarding registration, withdrawal, appealing marks, and most anything else you might need to know can be found on the university's website, here:
http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/

Requests for Academic Accommodations

For Students with Disabilities:
The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your ***Letter of Accommodation*** at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). **Requests made within two weeks will be reviewed on a case-by-case basis.** After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (*if applicable*).

For Religious Obligations:
Students requesting academic accommodation on the basis of religious obligation should make a formal, written request to their instructors for alternate dates and/or means of satisfying academic requirements. Such requests should be made during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist, but no later than two weeks before the compulsory event.
Accommodation is to be worked out directly and on an individual basis between the student and the instructor(s) involved. Instructors will make accommodations in a way that avoids academic disadvantage to the student.
Students or instructors who have questions or want to confirm accommodation eligibility of a religious event or practice may refer to the Equity Services website for a list of holy days and Carleton's Academic Accommodation policies, or may contact an Equity Services Advisor in the Equity Services Department for assistance.

For Pregnancy:
Pregnant students requiring academic accommodations are encouraged to contact an Equity Advisor in Equity Services to complete a letter of accommodation. The student must then make an appointment to discuss her needs with the instructor at least two weeks prior to the first academic event in which it is anticipated the accommodation will be required.

Academic Integrity
Violations of academic integrity are a serious academic offence. Violations of academic integrity – presenting another's ideas, arguments, words or images as your own, using unauthorized material, misrepresentation, fabricating or misrepresenting research data, unauthorized co-operation or collaboration or completing work for another student – weaken the quality of the degree and will not be tolerated. Penalties may include; a grade of Failure in the submitted work and/or course; academic probation; a refusal of permission to continue or to register in a specific degree program; suspension from full-time studies; suspension from all studies at Carleton; expulsion from Carleton, amongst others. Students are expected to familiarize themselves with and follow the Carleton University Student Academic Integrity Policy which is available, along with resources for compliance at: http://www2.carleton.ca/sasc/advisingcentre/academic-integrity/.

Sprott Student Services
The Sprott student services office, located in 710 Dunton Tower, offers academic advising, study skills advising, and overall academic success support. If you're having a difficult time with this course or others, or just need some guidance on how to successfully complete your Sprott degree, please drop in any weekday between 8:30am and 4:30pm. Our advisors are happy to discuss grades, course selection, tutoring, concentrations, and will ensure that you get connected with the resources you need to succeed! http://sprott.carleton.ca/students/undergraduate/support-services/
Be in the know with what's happening at Sprott: Follow @SprottStudents and find us on Facebook SprottStudents Sprott.

Important Information:
- Students must always retain a hard copy of all work that is submitted.
- All final grades are subject to the Dean's approval.
- For us to respond to your emails, we need to see your full name, CU ID, and the email must be written from your valid CARLETON address. Therefore, it would be easier to respond to your inquiries if you would send all email from your Carleton account. If you do not have or have yet to activate this account, you may wish to do so by visiting http://carleton.ca/ccs/students/

Important Dates and Deadlines – Winter 2017

- **January 2**
  University reopens
- **January 5**
  Winter term classes begin.
- **January 18**
  Last day for registration for winter term courses.
  Last day to change courses or sections (including auditing) for winter term courses.
  January 20-22, 27-29
  Fall-term deferred examinations will be held.
- **January 31**
  Last day for a fee adjustment when withdrawing from Winter term courses or the Winter portion of two-term courses (financial withdrawal). Withdrawals after this date will create no financial change to Winter term fees.
- **February 17**
  April examination schedule available online.
- **February 20**
  Statutory holiday, University closed.
- **February 20-24**
  Winter Break. Classes are suspended.
- **March 1**
  Last day for UHIP refund applications for International Students who will be graduating this academic year.
  Last day for receipt of applications from potential spring (June) graduates.
  Last day for receipt of applications for admission to an undergraduate program for the summer term.
- **March 10**
  Last day to request formal exam accommodations for December examinations to the Paul Menton Centre for Students with Disabilities. Late requests will be considered on case-by-case basis.
- **TBA**
  Last day to pay any remaining balance on your Student Account to avoid a hold on access to marks through Carleton Central and the release of transcripts and other official documents. An account balance may delay Summer 2017 course selection.
- **March 24**
  Last day for tests or examinations in courses below the 4000-level before the final examination period (see Examination Regulations in the Academic Regulations of the University section of this Calendar).
- **April 7**
  Winter term ends.
  Last day of fall/winter and winter-term classes.
  Last day for academic withdrawal from fall/winter and winter term courses.
  Last day for handing in term work and the last day that can be specified by a

course instructor as a due date for term work for fall/winter and winter-term courses.

- **April 10-25**
  Final examinations in winter term and fall/winter courses may be held. Examinations are normally held all 7 days of the week.
- **April 14**
  Statutory holiday, University closed.
- **April 25**
  All take home examinations are due on this day.