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|  | CIS 320  Systems Analysis and Design  Spring Semester, 2011  Dr. Robert M. Barker  Office: Room 360, CBPA  Phone: 852 - 4779  Userid: rmbark01@louisville.edu |  |

Motto:   Improvise; Adapt; Overcome.

Office Hours: M W 10:45- 12; and by appointment, if necessary.

Text:  Systems Analysis and Design: An Object - Oriented Approach with UML, Dennis, Tegarden and Wixom. 3rd Edition   Wiley Publishing (On schedule as DWT)

UML and the Unified Process: Practical Object-Oriented Analysis and Design.  Arlow and Neustadt.  2nd Edition.  Addison Wesley (On schedule as AN)

Building Web Applications with UML, Jim Conallen, Addison Wesley.  2nd Edition (On schedule as CN) **(Optional)**

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**Introduction:**

Much of the attention given to information technology (IT) focuses on the technology.  Trade journals, news broadcasts, and recruitment ads mention new technologies, buzzwords, and acronyms that capture our interest and amazement.  However, when I talk with CIOs and VPs of Information Systems departments, they speak of the qualifications of information systems professionals.  A discussion with Greg Levinsky, CIO of GE Consumer and Industrial, was particularly insightful.  Mr. Levinsky described the skill set he needs in his department.  He spoke of information systems specialists, such as database administrators and network specialists.  Although skilled professionals in these areas are often highly paid, he can always find them if he is willing to make the financial investment.  Alternatively, he can develop professionals with these skills within his department through vendor training programs and certifications.

He spoke of programmers, who are becoming a commodity within GE’s sphere of influence.  He described how inexpensive it is for GE to outsource this element of systems development to programming firms.

Then he spoke of the business/systems analyst, who is critical in improving and reengineering business processes at GE.  Mr. Levinsky indicated that the systems analyst, the person who understands what IT offers and how it may be applied to solve business problems, is much more difficult to recruit to his department.  He described how challenging it is to find individuals who have the orientation and ability to match business needs with technology opportunities.  In GE’s move to use the Web in improving its business processes, the business/systems analyst is at the center of business and technical decisions.

My goal is to provide an opportunity for you to acquire the knowledge set and skills to become a systems analyst.  Three knowledge and skill areas need to be addressed: (1) a conceptual understanding of systems analysis and design techniques (“a talking vocabulary”); (2) the ability to apply these techniques to an information systems project; and (3) the engagement skills needed to interact with the client.

I can teach elements from each of these areas, but much of the learning will come from within you.  To be successful as a systems analyst, you must learn to integrate what you learned in your business courses with what you have learned about information systems.  You must learn to take a systems orientation; to look at the problem from different perspectives.  You must learn to become an information systems professional.  I can create the environment, but it is up to you to take advantage of the opportunity.

**Prerequisites:**

CIS 111 or CIS 202, CIS 115 or CIS 215, CIS 211, MATH 205.  Students admitted prior to Fall 2004 may substitute MATH 111 (grade of C or better) for MATH 205.

**Course Description:**

Introduces the fundamentals of object-oriented analysis and design, including experience with a CASE tool.  Topics include requirements determination, feasibility analysis, modeling with Unified Modeling Language (UML) and data dictionary construction, data modeling and normalization, user interface requirements specification, and information security procedures.  Development of problem and design specifications for an information systems project is required.  Develops team skills, written and oral communication skills.

**Course Objectives:**

¨    To introduce the processes by which information systems are understood, analyzed, and designed.

¨    To create the information systems deliverables needed to conduct planning, analysis, and design activities (Note: implementation will be covered in CIS 420, CIS Development Project).

¨    To understand and to use object-oriented modeling with UML.

¨    To understand and to introduce iterative and incremental development.

¨    To develop the problem solving and critical thinking skills expected of a systems analyst.

¨    To develop the client engagement and professional skills expected of a systems analyst.

¨    To gain practical experience in group decision-making and in functioning as a member of an information systems development team.

¨    To enhance written and oral communication skills.

¨    To take the initiative in contributing to and in leading group activities.

**Course Assignments:**

¨    As a group, create deliverables associated with planning, analysis, and design activities.  These deliverables will be based on an object-oriented analysis and design methodology.

¨    The project deliverables will include oral presentations that summarize the major points of the corresponding milestones as well as a written report for each deliverable.  HTML prototypes will be developed to help capture system requirements and user expectations.

¨    Individual assignments will be required periodically during the semester.  These assignments provide the instructor with additional information regarding the student’s knowledge of systems analysis and design techniques and her/his ability to apply these techniques within the context of the project.

**Project Milestones:**

Expectations for the deliverables will be discussed during the class sessions prior to their due dates.  Each deliverable, except for the two project specifications, will be critiqued when it is submitted, but a score will not be assigned at the time.  Instead, suggestions for improvement will be identified, with the expectations that these suggestions will be addressed and incorporated in the respective project specification.  The project specifications will consist of the collection of the previous deliverables, integrated and presented as a professional document.  The two project specifications will be evaluated to determine the project score.

**Peer Evaluations:**

Peer evaluations of group members will be conducted in conjunction with the submission of project deliverables.  The peer evaluations are intended to be constructive in nature, documenting the strengths and weaknesses of each group member.  These evaluations will be treated confidentially by the instructor.  If a team member’s contributions are lower than expected, the team member may be interviewed by the instructor to evaluate the situation.  Peer evaluations are an important component of professional development and team building, and they should be considered thoughtfully and prepared objectively.

**Exams and the Final Exam Period:**

Three examinations are scheduled during the semester.  Exam coverage will be discussed during the class sessions prior to the exam date.  All exams will be closed book and closed notes.  Graded exams may be reviewed by students, but they must be returned to the instructor for retention in his files.  The final exam period may be used to present the Elaboration Phase Specification and the System Prototype to the client and instructor.

**Course Grading Criteria:**

The student's course score will be determined as follows:

¨    Exams (three at 18% each)                                54%

¨    Project Specifications (including prototypes)        34%

¨    Assignments                                                      12%

Grading Criteria Note: The weighting factors listed above will be applied if the average of the student’s exam scores is 60% or better.  If the average of the student’s exam scores is less than 60%, the student’s average exam score will be used to determine the student’s course grade, and the student’s project score and assignment scores will be omitted; i.e., the student’s contributions to the group project are important, but they will not offset poor performance on the exams.  Conversely, in situations where an individual’s contributions to the group project do not meet minimum expectations, the student will fail the course independent of her or his exam scores.

**Grading Scale:**

 ¨    The course grade will be assigned based on the student’s overall course score.  The following grading scale will be used:

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| 90 - 100 | A |
| 80 - 89 | B |
| 70 - 79 | C |
| 60 - 69 | D |
| 0 - 59 | F |

 ¨    The instructor reserves the right to curve course averages upwards to fit this scale if appropriate, and if necessary.

Grading Scale Note 1:  Peer evaluations will be conducted during the semester.  They may influence each student’s project score; that is, the student’s overall project score may include deviations from the team grade based on individual contributions – **a letter grade or more**.  The instructor reserves the right to adjust and/or to ignore the peer evaluation assessments if they are not consistent with his observations of the student’s activities and contributions.

Grading Scale Note 2:  The grading scale listed above, including Grading Scale Note 1, will be applied if, and only if, the student satisfactorily completes three professional development exercises sponsored by the Ulmer Career Center.  If the student fails to complete any of the three exercises satisfactorily, he/she will receive a grade of F for the course, independent of performance on the exams, project, and assignments.

**Last Day to Drop Course Without Academic Penalty:**  February 28, 2011

**General Policies:**

¨    Students are expected to attend class.  They are encouraged to take notes and to participate in the discussions.

¨    Students are expected to read the assigned chapters prior to class.  Students are responsible for all material discussed in class.  Be prepared to contribute to the discussion.

¨    Any assignment submitted late will not be accepted; i.e., it will receive a score of zero points.

- Please make every effort to make it to class on time. It is disruptive to the class to have members arriving more than ten minutes late. If you are later than ten, wait for the break to enter the room.  Turn off all cell phones and beepers prior to entering class.  If the class meeting is interrupted by a phone or beeper, the owner of that device will hand write a personal note of apology to each attendee of that class meeting, to be delivered by the next class meeting.  Failure to do so will result in a 10% reduction in that students course grade.

¨    Written work and oral presentations must conform to standards expected of junior-level college students.  Failure to produce professional quality work will result in point deductions.  In extreme cases, poorly prepared written work will not be accepted; there may be opportunities to revise the deliverable, depending on the severity of the errors.

¨    Each student is expected to participate in the oral presentations.

¨    Students are expected to make time to participate in group meetings and activities as required to produce the deliverables.  Failure to participate is usually reflected in low peer evaluations.

¨    Due to the nature of the problems selected as course projects, students may be required to sign non-disclosure agreements to shield themselves from business liability.  Failure to complete such agreements will result in students being administratively removed from the course.

¨    The instructor may remove a student from his/her group if the student is not contributing to the team effort.  In this case, the student must complete the information systems project alone.

¨    The student is responsible for contacting the instructor, at least 48 hours in advance, if an exam date, assignment date, or a milestone presentation date cannot be attended.  Only documented reasonable excuses will be accepted, as determined by the instructor.

¨    The class schedule, procedures for grading the course, and other details of the syllabus are subject to change in the event of extenuating circumstances.

**Computer Resources and Software:**

¨    The project deliverables may be created using Microsoft Office, Microsoft Visio, and Rational Suite Enterprise.  These software tools are available in the CIS Computer Laboratory (Room 054).

¨    Rational and/or Visio may be used for analysis and design modeling.  Specific deliverables may require use of one of these products.

¨    The University e-mail system and Blackboard will be used to communicate with team members.

**Student Academic Rights and Responsibilities:**

“Every student is expected to be thoroughly familiar with the University's Code of Student Rights and Responsibilities and Student Conduct which can be found in the 'General Information' section of this catalog.

Every student is responsible for reading the academic policies in the Undergraduate Catalog and official announcements of the College of Business and for abiding by such regulations.

Specifically, every student is responsible for knowing the grade point averages and program requirements needed for graduation.  Students are encouraged to see a COB academic advisor to clarify any questions or concerns.

Along with preparing for and attending class, each student has the responsibility to promote high academic standards.

Students are expected to cooperate in all classes with faculty members to achieve an optimal learning environment.  Inappropriate classroom behavior may result in the student being withdrawn from the course, and potentially assigned academic penalties. Inappropriate classroom behavior will be dealt with in the same manner as academic dishonesty.

The COB will not tolerate academic dishonesty.  The COB has a strong policy of academic discipline for action against students who commit academic dishonesty or conduct themselves inappropriately in the classroom.  A proven case of academic dishonesty will normally result in the student being denied admission to or dismissed from the COB.

Academic dishonesty is defined by the Code of Student Conduct in the Undergraduate Catalog.  Its definition pertains to but is not limited to cheating, fabrication, falsification, multiple submission, plagiarism, and complicity.  It is the student’s responsibility to maintain high standards of ethical conduct, and intellectual integrity and to be familiar with the definition of academic dishonesty.

As evidence of the seriousness with which the COB regards these matters, academic dishonesty allegations are handled in accordance with COB Procedures for Dealing with Academic Dishonesty.”

University of Louisville Undergraduate Catalog, Fall 2006 through Summer 2008, page 43.

**CIS Faculty Statement Regarding Academic Dishonesty**

The CIS faculty takes violations of the university policy on academic dishonesty seriously.  Students are encouraged to review the policy and to understand the consequences of any action that is proven to be a violation of the policy.

Students are expected to do their own work when assignments and exams require individual work.  For example, students may not copy the work of others, either manually or electronically, under these conditions.  Further, students who allow their work to be copied by others risk violation of the academic dishonesty policy.

The CIS faculty will take full and complete action against any student who violates the academic dishonesty policy.  In proven cases of violation of the policy, students may be suspended from the College of Business, as stipulated in the University of Louisville undergraduate and graduate catalogs.  Cases of academic dishonesty will be processed in accordance with College of Business procedures.

Addendum:  If  the work submitted by you is not your own work, I will deal with it in by failing you in the course, and pursuing whatever policies violated pursuant to the Code of Student Rights and Responsibilities, the Computer Information Systems Faculty Statement Regarding Academic Dishonesty, and the College of Business  Procedures for Dealing with Academic Dishonesty.  In a severe case, you may be removed from the College.  This includes using any un-cited materials found on the web.  FYI: Don't use Wikipedia.  Once more: any attempt at plagiarism in this course will meet with your failing the course, and perhaps more severe consequences.

**ADA Policy Statement:**

“The University of Louisville is committed to providing equal opportunity for persons with disabilities.  This commitment includes complying with the Americans with Disabilities Act of 1990 (ADA), and Sections 504 and 508 of the Rehabilitation Act of 1973.  In addition, all of the University’s websites and online courses will comply with the web page design standards established by the World Wide Web Consortium (W3C).  The University of Louisville strives to maintain a barrier-free, welcoming environment for everybody.

The ADA Coordinator, located in the Affirmative Action Office (502 852-6688), will monitor compliance and assist all unit heads in meeting equal opportunity obligations.  The University Disability Resource Center staff (502 852-6938) will assist the University community by serving as an information resource center and coordinating support services for students with disabilities.  No otherwise qualified individual with a disability shall, solely by reason of such disability, be excluded from participation in, be denied benefits of, or be subjected to discrimination in University programs.  The President, Board of Trustees, Student Government, Faculty and Staff Senates affirm the University’s long standing and continuing commitment to Equal Opportunities for persons with disabilities.”

University of Louisville Undergraduate Catalog, Fall 2006 through Summer 2008, page 21.

**Guidelines for Team Work:**

¨    The group’s process is important in producing the group’s product.  A good process usually results in a good product, whereas a poor process usually results in a poor product.  Plan and coordinate individual activities so that the group develops and follows a good process.

¨    The whole is greater than the sum of its parts.  A team working together will develop a higher quality information system than if each member works individually.

¨    The nature of systems analysis and design activities requires a high degree of collaboration in order to produce an integrated report that is complete, consistent, credible, and that communicates with the intended audience.  A strategy of distributing the elements of the deliverables among group members (e.g., “divide by n”) typically does not produce an acceptable written report.  Adopt a strategy that allows time for team review and revision of each element before the deliverables are submitted.

¨    Each team member has something of value to contribute.  Each member has a responsibility to listen and to respond to suggestions.

¨    Ideas are useful only when they are communicated and recorded.  Take the effort to describe the idea in a written form that allows it to be communicated to others, as well as providing a permanent record of the team’s considerations and decisions.

¨    Be willing to compromise.  Rarely are solutions optimal, but they can be assessed in terms of consistency and completeness.

¨    Written specifications drive implementation.  No software may be created without a requirement to do so and without a corresponding design model specifying its content and behavior.

¨    The nature of this course requires that students meet outside of class.  Each team member must be willing to find a meeting time that will accommodate the entire team.

¨    Every student is expected to develop her/his analytical and systems modeling skills.  Assign tasks so that everyone has an opportunity to learn the fine points of systems analysis and design.

¨    Use the e-mail systems to communicate with team members.

**“*Do Not Confuse Activity***

***with Achievement”***

 – John Wooden

**What the Student May Expect of the Instructor:**

¨    Class sessions will be used for discussions of the assigned readings and the project deliverables.  Individual team meetings may be held periodically.

¨    The instructor will provide the coaching role of a mentor as well as the critiquing role of a senior systems analyst.

¨    Project teams will function as self-organizing, leaderless teams (this does not mean that a leader may not emerge based on proven ability or team selection).  Each team member has an equal voice in all decision-making activities.  Project deliverables will be constructed as team activities.  The instructor will make sure that the team conforms to project management practices.

¨    The instructor will help the student integrate the systems analysis and design principles within the context of an actual information systems development project.

¨    The instructor will identify areas where client engagement and professional skills are improving, and conversely, areas where additional improvement is needed.

**What the Instructor Expects of the Student:**

¨    Attend class, read the assigned chapters, and participate in the discussions.

¨    Prepare for the exams.

¨    Attend all team meetings.

¨    Participate in team discussions and decision-making activities.

¨    Contribute to the team effort; be a team player.

¨    Complete the assignments on time.

¨    Request help:

¨    Ask questions if you are not sure what you are supposed to do.

¨    Make an appointment to see the instructor.

***This Course Starts You***

***On the Transition from***

***Information Systems Amateur to***

***Information Systems Professional***

**CIS 320-01, Spring 2011 – Iteration Deliverables (Tentative, Subject to Revision)**

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| **UP Phase/Iteration** | **Deliverables** |
| Inception /  Iteration #1 (I1),  System Request | ·         System request  ·         Problem statement, business case, and feasibility considerations  ·         “As-is” and “To-be” process models  ·         Vision document (draft), with system requirements and features  ·         Team charter |
| Inception /  Iteration #2 (I2),  Inception Phase Prototype | ·         Vision document (with complete feasibility analysis)  ·         System requirements  ·         List of use cases: actors and use of features  ·         Initial architecture considerations  ·         Risk analysis  ·         Gantt chart  ·         Inception Phase HTML prototype (“To-be” model showing data needs and process flows) |
| Inception Phase Specification | ·         Revised I1 and I2 deliverables, integrated as a technical report  ·         This deliverable will be graded when submitted! |
| Elaboration /  Iteration #3 (I3),  Use Case Prototype, Version 1 | ·         Use case descriptions for high risk use cases  ·         Use case diagram  ·         Updated Gantt chart  ·         Use case HTML prototype (high risk use cases) |
| Elaboration /  Iteration #4 (I4),  Use Case Prototype, Version 2 | ·         Use case descriptions for low risk use cases  ·         Use case diagram  ·         Sequence diagram for each use case (high risk and low risk)  ·         Class diagram  ·         CRC cards, textual analysis, and/or prototype analysis  ·         Updated Gantt chart  ·         Use case HTML prototype (low risk use cases) |
| Elaboration /  Iteration #5 (I5),  User Interface Prototype | ·         Database design and data definitions  ·         Physical architecture design  ·         Procedures to address security and non-functional requirements  ·         User interface navigation diagram and screen layouts  ·         Updated Gantt chart  ·         User interface HTML prototype (all use cases) |
| Elaboration /  Iteration #6 (I6),  System Specification | ·         Inception Phase Specification  ·         Use cases and use case diagram  ·         Sequence diagram for each use case  ·         Class diagram (including justification for its structure)  ·         Database design and data definitions  ·         Physical architecture design  ·         Procedures to address security and non-functional requirements  ·         User interface navigation diagram and screen layouts  ·         Updated Gantt chart  ·         Elaboration phase HTML prototype |

**CIS 320-01, Spring 2011 – Course Schedule (Tentative, Subject to Revision)**

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| **Week /**  **Date** | **Assigned Readings / Exams** | | **Assignment and Deliverable Due Date** |
| **1st Half** | **2nd Half** |
| 1  Jan.10 | Course Introduction  SAD 1 | SAD 2  **Client Visit**  Team Formation |  |
| 2  Jan. 17 | UML 1-2, Web 1-2    Problem Discussion | UML 14,  Problem Discussion |  |
| 3  Jan. 24 | SAD 3-4,  Problem Discussion | Web 6-7  Problem Discussion | **Assignment 1** |
| 4  Jan. 31 | I1: System Request Presentation | I1 Discussion,  UML 3 | **Assignment 2** |
| 5  Feb. 7 | SAD 5 | **Exam #1** | I1: Documentation |
| 6  Feb. 14 | SAD 6 | I2 Discussion | I2: Documentation |
| 7  Feb. 21 | UML 4-5, Web 8 | SAD 8 |  |
| 8  Feb. 28 | I2: Inception Phase Presentation | I2 Discussion | **Inception Phase Specification** |
| 9  March 7 | SAD 7, UML 6-8 | UML 9-10, Web 9 |  |
| 10  March 14 | No Class – Spring Break | No Class – Spring Break |  |
| 11  March 21 | I3: Use Case Prototype, Version 1 | **Exam #2** | I3: Documentation |
| 12  March 28 | UML 11-13, Web 10 | Discuss Assignment 3 | **Assignment 3** |
| 13  April 4 | I4: Use Case Prototype, Version 2 | SAD 8-12 | I4: Documentation |
| 14  April. 11 | I5: User Interface Prototype | I5 Discussion | I5: Documentation |
| 15  April. 18 | SAD 13 | **Exam #3** |  |
| 16  April. 25 | I6: Elaboration Phase Prototype and Presentation | Reading Day: 4/26 | **I6: Elaboration Phase Prototype and Presentation** |
| April 29 | Friday - Final Exam |  | 8:00AM - 10:30AM |

SAD:       Systems Analysis and Design with UML Version 2.0 (2nd Ed.)

UML:      UML 2 and the Unified Process (2nd Ed.)

Web:       Building Web Application with UML (2nd Ed.) **OPTIONAL**