LIS561 Syllabus, Dr. Wang, Fall 2011

LIS561 – Information Systems Analysis and Design
Fall 2011, Dr. Jianqiang Wang
General Course Information

Instructional Staff

Dr. Jianqiang Wang (Instructor)
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Email: jw254@buffalo.edu
Tel: 716-645-1478

Schedule

Lecture: 4:10pm - 6:50pm, Thursday, 146 Park.
Office hours:
• 2:00pm - 4:00pm, Thursday
• Other times by appointment

Textbook and readings

• Additional readings. See the “Weekly Readings” section for detail.

Official Catalog Description

This course introduces the principles for analysis, development, evaluation, and selection of computer-based information systems in libraries and other information environments. Includes seminar presentations based on individual research in information systems.

Prerequisite: LIS 506 Introduction to Information Technology, or the instructor’s permission.

Course Goals

The overall goal of the course is for students to learn the conceptual principles and the practical skills of analyzing and designing information systems. The course only slightly touches on the actual development of computer programs and their testing and maintenance.

Upon successful completion of this course, students will be able to:

• Understand the role of a systems analyst within an organizational context;
• Identify and apply systems analysis concepts, terms, and techniques, and use them in appropriate contexts;
• Describe the major alternative methodologies used in developing information systems and the considerations involved in choosing which methodology to use;
• Produce the systems documentation at each point in the analysis and design of an information system, and to do so with clarity and completeness;
• Analyze a business need for information and to develop an appropriate strategy to solve the problem and provide the required information service.
• Prepare and use various information gathering techniques for eliciting user information requirements and system expectations;
• Construct and interpret a variety of system description documents, including physical and logical data flow diagrams, entity-relationship diagrams, structure charts, and decision tables, as well as screen, form, and report layouts;
• Communicate effectively, in both written and oral forms, systems specifications, and to be persuasive in these presentations.

Methodology

The course will be delivered through lectures, discussions, exercises, individual assignments, a final exam, and a team project. Normally, a class session will consist of a lecture session followed by an exercise session.

It is expected that an average student will spend at least 9 hours per week on the course in addition to the class session.

Evaluation

Evaluation of students’ learning outcome will be conducted through individual assignments, a team project, a final exam, and class attendance and participation.

Individual assignments (10% each, 30% in total). There will be three individual assignments that cover:
• Systems requirements gathering;
• Process modeling;
• Logic modeling;
• Data modeling;
• Database design;
• Interface design;
• Software testing;
• User documentation generation

Team project (40%): Students will work in a team of four persons on the analysis and design of an information system either decided by the team or assigned by the instructor. Each team will conduct comprehensive analysis and careful design of a real-life information system by applying the systems analysis and design principles, methods, and techniques that they learn from the course. The end product of a team project will be a detailed systems specification document that
programmers can rely on to build a working system. A detailed description of the project can be found in the “Course Project” page.

**Final exam (20%).** An open-book, in-class exam will be held in the last week of the semester. It will cover all the things you have learned in this course.

**Class participation (10%).** Students are required to attend all class sessions and complete all in-class exercises. Active participation in discussion in the classroom and on the online discussion board is expected.

Scores for each item will be assigned on a 100 point scale. The final grade will be computed by combining the score of each item in the above table. The conversion from a score grade (S) to a letter grade (L), which is what will be reported to the university, will follow the rules listed below:

<table>
<thead>
<tr>
<th>Score (S)</th>
<th>S &gt;= 95</th>
<th>95 &gt; S &gt;= 90</th>
<th>90 &gt; S &gt;= 87</th>
<th>87 &gt; S &gt;= 83</th>
<th>83 &gt; S &gt;= 80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter (L)</td>
<td>A</td>
<td>A-</td>
<td>B+</td>
<td>B</td>
<td>B-</td>
</tr>
<tr>
<td>Score (S)</td>
<td>80 &gt; S &gt;= 77</td>
<td>77 &gt; S &gt;= 70</td>
<td>70 &gt; S &gt;= 60</td>
<td>S &lt; 60</td>
<td></td>
</tr>
<tr>
<td>Letter (L)</td>
<td>C+</td>
<td>C</td>
<td>D</td>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>

Since there are multiple evaluation items and some of them will be graded with letter grades, they have to be converted into scores on a 100-point scale. The follow schema will be used for the conversion:

<table>
<thead>
<tr>
<th>Score (L)</th>
<th>100</th>
<th>97.5</th>
<th>92.5</th>
<th>88.5</th>
<th>85.5</th>
<th>82</th>
<th>78.5</th>
<th>73</th>
<th>65</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>A</td>
<td>A-</td>
<td>B+</td>
<td>B</td>
<td>B-</td>
<td>B-</td>
<td>C+</td>
<td>C</td>
<td>D</td>
<td>F</td>
</tr>
</tbody>
</table>

The grade of A signifies superior work beyond basic requirements of the course, B signifies adequate work in response to the requirements, and C and below signifies that work does not meet the basic requirements.

**Administrative Details**

Late submission of homework due to less extreme causes (such as breakdown of your home computer, attending a conference, busy work schedule, etc.) will be accepted only if the submission is no later than one week, and a “one level down” grade reduction policy will be applied to the delayed work (i.e., A becomes B, B becomes C, etc.). Homework submitted more than one week after the deadline will not be accepted except the late submission is due to extreme causes such as serious illness or personal injury of traffic accidents. In that case, supporting documents such as doctor appointment slips or police records of car accidents must be provided to the instructor as early as possible. If the supporting documents are verified, no grade reduction will be applied.
Student work (assignments and the project report) must be submitted before the last day of the semester for consideration of grading.

Incomplete grades may be granted in cases of illness or other difficult circumstances. An Incomplete grade must be requested in writing by filling out a "Request for Grade of Incomplete" form and the form must be received by the instructor before the last day of the final exam week.

Academic integrity is a serious matter. It is expected that you will behave in an honorable and respectful way as you learn and share ideas. Therefore, recycled papers, work submitted to other courses, and major assistance in preparation of assignments without identifying and acknowledging such assistance are not acceptable. All work for this class must be original for this class. Be forewarned: faculty members do talk to each other and as information specialists we can spot plagiarism and track it down. Please be familiar with the University and the School policies regarding plagiarism. Read the Academic Integrity Policy and Procedure for more information.

Special accommodation is always considered. Any student with a disability that requires accommodation under the terms of federal regulations must present an accommodation request approved by the university to the instructor by the second class session. Students are advised to register with the Office of Disability Services (25 Capen Hall).
### Weekly Topics, Readings, and Deadlines

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Topics</th>
<th>Readings</th>
<th>Due at 4:10pm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9/1</td>
<td>Course Overview Development Methodology</td>
<td>Hoffer C1 Scacchi Fowler</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9/8</td>
<td>The Origins of Software</td>
<td>Hoffer C2 Mankiw Schmidt</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9/15</td>
<td>Project Management</td>
<td>Hoffer C3 Burke MS Project</td>
<td>Project proposal</td>
</tr>
<tr>
<td>4</td>
<td>9/22</td>
<td>Project Planning</td>
<td>Hoffer C4-5 Taylor</td>
<td></td>
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<tr>
<td>5</td>
<td>9/29</td>
<td>Systems Requirement</td>
<td>Hoffer C6 Faulk Wiegers</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>10/6</td>
<td>Process Modeling</td>
<td>Hoffer C7</td>
<td>Assignment 1</td>
</tr>
<tr>
<td>7</td>
<td>10/13</td>
<td>Data Modeling</td>
<td>Hoffer C8 Chen</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>10/20</td>
<td>Database Design (I)</td>
<td>Hoffer C9 SmartDraw</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>10/27</td>
<td>Database Design (II)</td>
<td>Adams</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>11/3</td>
<td>Interface Design</td>
<td>Hoffer C10-12</td>
<td>Assignment 2</td>
</tr>
<tr>
<td>11</td>
<td>11/10</td>
<td>Systems Implementation</td>
<td>Hoffer C13 Luo</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>11/17</td>
<td>Systems Maintenance</td>
<td>Hoffer C14</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>11/24</td>
<td>No class (fall recess)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>12/1</td>
<td>Object-Oriented Analysis and Design</td>
<td>Appendices of Hoffer C3, C7, C8</td>
<td>Assignment 3</td>
</tr>
<tr>
<td>15</td>
<td>12/8</td>
<td>Project Presentation</td>
<td></td>
<td>Project report</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>Final Exam</td>
<td></td>
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</tr>
</tbody>
</table>
Reading List

All readings are either from Hoffer et al. “Modern Systems Analysis and Design, 6th Edition” or available online. This list is tentative, meaning I may replace some of them with readings that I come across and feel more appropriate. Of course in that case, I will make the change at least one week earlier so that you have enough time to read.

Week 1: Methodology
- Hoffer, Chapter 1

Week 2: The Origins of Software
- Hoffer Chapter 2

Week 3: Project Management
- Hoffer, Chapter 3

Week 4: Project Planning
- Hoffer, Chapter 4 & 5

Week 5: Systems Requirements
- Hoffer, Chapter 6
• Stuart R. Faulk, “Software Requirements: A Tutorial,” available at:
• Donald Firesmith, “Prioritizing Requirements,” available at:

Week 6: Process Modeling
• Hoffer, Chapter 7

Week 7: Data modeling
• Hoffer, Chapter 8
  • Peter Pin-Shan Chen, “The Entity-Relationship Model: Toward a Unified View of Data,”
    available at:

Week 8: Database Design (I)
• Hoffer, Chapter 9
  • SmartDraw tutorial, “Drawing ER Diagrams in SmartDraw,” available at:
    http://www.smartdraw.com/resources/tutorials/entity-relationship-diagrams/

Week 9: Database Design (II)
• David Adams and Dan Beckett, “Normalization is a Nice Theory,” available at:

Week 10: Interface Design
• Hoffer, Chapter 10-12

Week 11: Systems Implementation
• Hoffer, Chapter 13
  • Lu Luo, “Software Testing Techniques,” available at:

Week 12: Systems Maintenance
• Hoffer, Chapter 14

Week 13: No class (Winter Recess)
Week 14: Object-Oriented Analysis and Design
- Hoffer, Appendixes of Chapter 3, 7, & 8
Project Description

The course project in LIS 561 is designed to provide students an opportunity to integrate knowledge and skills acquired throughout the course and to apply them to the improvement of an existing information system or the development of a new system. Each student will work in a group of three persons on a project identified in the first three weeks by the team or assigned by the instructor. While it is up to each team how tasks will be allocated among members, generally the following tasks are expected:

- Planning and managing the project;
- Collecting and managing user requirements;
- Structuring user requirements through process modeling, logic modeling, and data modeling;
- Designing the database and functional components;
- Designing the user interface;
- Generating system documentation;
- Writing the project report;
- Presenting the project.

A project manager will be decided by each team, who will coordinate the project activities. The instructor will work as a consultant of the project who provides advice and help solve problems encountered by the team. However, it is the responsibility of a team to report such problems in a timely manner to the instructor.

The project consists of a project proposal, several informal intermediary in-class presentations, a project report, and a final presentation (possibly open to DLIS/GSE students, faculty and staff).

Project Proposal. The project proposal is due by Week 3, September 15. The proposal will be a brief description of the information system that the team will work on, i.e., the nature of the information system. Specifically,

- What the system will be about?
- Why is it important to develop such a system?
- Are there any similar existing systems? If so, how will your system be different?
- Who are the (potential) users of the system?
- What high-level functions will the system provide?

Students/teams are strongly encouraged to discuss your project ideas with the instructor as early as you can. Project teams are formed by students voluntarily. As a general piece of advice, you should try to find teammates with complementary skills.

Project presentation. On December 8 in Week 15, each team will give a presentation of its project. If your project topic was originated from a client, that client will be among the audience. Your presentation will explain:
• What will the system designed through this project be used for?
• Who are the users and how did you collect their requirements?
• How did you structure the requirements? (This will be process modeling, logic modeling, and data modeling).
• What functional units of the system have you come up with and how do they work together?
• What kind of interfaces will the system have and how do they support users’ interaction with the system? (A task walk-through with the mock interfaces will be helpful)

Project Report. The final project report is due by December 8 in Week 15. It should include the following elements:

• Mission, goals, and strategy of the organization that uses the system.
• The alignment of the developed information system to the mission, goals, and strategy of the organization.
• A baseline project plan (BPP).
• Some sort of feasibility analysis of the proposed system.
• Requirements for the proposed system and the approaches used to determining them, which may include:
  o Interview protocols and results.
  o Existing system specifications.*
  o Other existing system documents (forms, reports, screenshots, etc.).*
• A narrative of the functional differences between the existing system and the new system.*
• A context diagram and data flow diagrams (DFDs) for Level-0 to Level-n for the existing system, and a clear description of them.*
• A context diagram and DFDs for Level-0 to Level-n for the new system, and a clear description of them.
• A clear description of the differences between these two sets of DFDs.*
• Logic modeling for the new system.
• An entity-relationship (E-R) diagram for data covered in the existing system.*
• An E-R diagram for data covered in the new system.
• A clear description of the differences between these two E-R diagrams.*
• Logical database design for the new system. The resulted relations should comply with the third normal form (3NF).
• Physical database design for the new system.
• Design of forms, reports, interfaces, and dialogues of the new system.
• A plan of evaluating/testing the system
(* items are required only if the project is to improve an existing system.)

Submission Format. The project proposal and report should be written electronically with 12-point font of text body, single-spaced, with a cover page with the title of the project and the names of the team members. Your report should be marked clearly with meaningful titles of sections and subsections. Also, your proposal or report should be submitted as one document in either PDF or MS Word format (i.e., all diagrams should be inserted included in the appropriate
pages). All diagrams should be drawn with diagramming tools such as MS Visio or SmartDraw and be interspersed appropriately in their corresponding sections in the report. Interview protocols or questionnaires can be put in the appendix section.

**Project Grading.** Normally members of a project receive the same grade for it. If a member impedes the progress and the completion of the team project because he/she fails to complete his/her work on schedule, misses team meetings, or refuses to communicate with others, the team leader and/or any other members should report the problem to the instructor. In that case, the violating member may receive a different (lower) grade for the project.

Information systems development is a highly iterative process. It is common for system developers to go back to revise things produced in earlier phases. Therefore, each team should be prepared and willing to continuously improve things that have been created and/or to add things that are missing.