COURSE SYLLABUS
MIS 432
SYSTEMS ANALYSIS AND DESIGN

INSTRUCTOR: Sree Nilakanta
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COURSE DESCRIPTION
This is an introductory course in systems analysis and design for computer programmers and systems analysts. The course presents an overview of information systems and the systems development life cycle for the systems analyst. Course emphasis will then focus on tools and techniques that the programmer or analyst can use to document information systems. Classical and structured tools for describing data flow, data structure, process flow, file design, input and output design, and program specifications will be applied to documenting systems. Emphasis will also be placed on the integrated use of the classical and structured tools. The course will survey other important skills for the systems analyst such as fact-finding, communications, project management, and cost-benefit analysis.

KEY WORDS FOR CAREER PLANNING AND JOB HUNTING

PREREQUISITES
At least two semesters of programming courses (including at least one introductory COBOL course) or equivalent experience is recommended (one course is required, e.g., COM SCI 201). It is preferred that students have programmed with sequential, direct, and indexed data files. No previous systems background is required.

COREQUISITE
Students who have not already completed the COBOL course may enroll concurrently. Also, concurrent enrollment in MIS 433 is recommended.

COURSE MATERIALS
Required Textbooks:

or
The final Project will be returned only after one semester. Past projects will NOT be loaned to you for duplication. This project may prove to be a valuable job hunting aid - you will want to keep a copy. It is also recommended that you copy project milestones before submitting them to your instructor. It protects you and allows you to continue to work on the project while the milestone is being graded. WARNING: There is a substantial duplication cost associated with this course!

**EVALUATION**

- Project: 100 points
- Peer Evaluation: 100 points
- Assignments/Quizzes: 100 points
- Mid Term: 100 points
- Final: 100 points

Total: 500 points

**Important Disability Information**

“Please address any special needs or special accommodations with me at the beginning of the semester or as soon as you become aware of your needs. Those seeking accommodations based on disabilities should obtain a Student Academic Accommodation Request (SAAR) form from the Disability Resources (DR) office (515-294-6624). DR is located on the main floor of the Student Services Building, Room 1076.”

**COURSE THEME**

In your programming courses, program specifications for programming assignments have typically been supplied by your instructors. Where did these specifications come from? They are provided by a Systems Analyst who prepares the specifications in response to business requirements. What is a Systems Analyst? An appropriate job description might read as follows:

A systems analyst shall be responsible for studying the problems and needs set forth by an organization and to determine how people, methods, and computer technology can best accomplish improvements. When computer technology is used, the analyst shall be responsible for the efficient capture of data from its business source, the flow of that data to the computer, the processing and storage of that data by the computer, and the flow of useful and timely information back to business users.

Systems analysis, systems design, systems implementation, and systems support are the primary activities of the systems analyst. Systems analysis is the study of a current business system and its problems, the definition of business needs and requirements, and the evaluation of alternative solutions. Systems design is the general and detailed specification of a computer based solution that was selected during systems analysis. Included in the design specifications are the programming specifications with which you are already familiar. Systems implementation is placing system into operation. Systems support is the ongoing support after it has been placed into operation.

The primary theme of the course is the use of systems analysis and design techniques to develop and document effective computer based information systems. You will be exposed to the entire systems analysis and design process, however, your project will emphasize systems design since that is more of an entry level skill.
You will learn how to use a wide variety of systems analysis and design tools and techniques. These tools and techniques are used to document information systems that are built by systems analysts and programmers. These tools allow the systems analyst to communicate with business users to learn their problems and needs. These tools also help the systems analyst communicate business needs to the computer programmers. Finally, these tools and techniques allow us to create intelligent and friendly computer based solutions for business problems.

It is important to realize that this course will not make you a proficient systems analyst - no more than your first programming course made you a proficient programmer. This is, however, a very important course for you! The course has consistently been rated by MIS graduates as one of the most practical and valuable learning experiences they received as a student. Furthermore, many students have found that the skills they learned could be immediately applied in industry. Even if you don't immediately apply the skills you will learn in this course, the value of this course still includes:

- A much better understanding of the entire information systems development process: from the identification of the business problems and needs to the design of an improved system to the writing of computer programs. Possibly for the first time, you will truly understand the whole process and where you might fit in.

- Improved technical communication skills. Your ability to communicate with both technical and non-technical people should be improved through the proper use of the tools. Your writing and speaking skills may also be enhanced as you learn how to present your documentation to your instructor.

- Improved programming skills. What? That's right. You should be a better programmer if you understand how to read and modify the design documentation prepared by a systems analyst. Programmers frequently find themselves redoing poorly prepared or incomplete design specifications.

- A background for continued study of systems analysis and design. In subsequent courses, you will learn "how" to do systems analysis and design using specific strategies and methodologies used by systems analysts. There is more to systems analysis and design than tools and techniques.

- A better understanding of information systems in general. You will learn many capabilities and characteristics of good information systems. This will help you design more effective systems during your career.

**COURSE METHODS, PROJECT, AND REQUIREMENTS**

*It is assumed that you will read the assigned chapters.* Although the material maybe summarized, lectures will be used mainly to further demonstrate the tools and techniques and to answer specific questions. The instructor will give an unannounced quiz if it is felt that the class, as a whole, has not read the assigned textbook material. Laboratory periods will mainly be used to help students with their projects. The instructor may give small in-class exercises or collect drafts of the work the student team did during the laboratory session. Therefore, bring your previously graded project milestones to all labs - you will need them.

**NOTE:** We don't have any pre-allotted lab time during this semester. Occasionally, a class period or two may be assigned for lab demos or classes. Otherwise, you sign up for the use of computers and treat those hours as lab time.

A semester long project will dominate your activities during the course. You will work in teams of 3 to 4 students. You will define and formulate your own team's project during the first five weeks. While you are defining your systems project, you will be learning some of the fundamentals of systems analysis and design. You will study the information system and learn the capabilities and characteristics of good
information systems. Study them well because you will have to apply them to your project. You will also learn about the system development life cycle, the process used by an analyst to build information systems. The remainder of the course will focus on practical tools and techniques. A typical entry level project for a young systems analyst is to design a new information system in response to the analysis provided by a more experienced analyst. Your project will provide a similar experience. But we do have some realistic problems to overcome.

First, it is not realistically possible for you to provide your own systems analysis specifications. That would require you to "do" systems analysis for your project, an activity which would consume too much time. Second, it is equally unrealistic for your instructor to provide you with the analysis specifications for your design project. The instructor would have to explain how those specifications were developed and invest the time to develop these specifications - in addition to teaching this course! Furthermore, you are not likely to be as comfortable with the business problem if you did not do the analysis yourself.

But we do have a compromise solution. You will be assigned to a project team. Your team will work on a single project. The Midwest Realty will be our term project. The system will be refined through periodic consultation with me so that all student projects are of the same size and all systems exhibit some important information system characteristics. Again, this project definition activity will occur during the first four weeks while you are studying the fundamental concepts unit.

During the remaining weeks of the semester, your team will apply the tools and techniques of systems analysis and design to your project. You are encouraged to improve the system by designing features that you will learn are characteristics of better information systems. The value of this project should be apparent. You will learn the tools and techniques of analysis and design without having to deal with the process and people problems of analysis and design. It does in no way diminish the importance of the behavioral aspects of systems analysis. You will have a chance to encounter these issues in MGMT 438 projects.

The project will run very similar to an actual project. I will play the role of project manager and quality assurance manager. As project manager, I will continually review your progress on the project (although you are ultimately responsible for keeping up). As quality assurance manager, I will review your documentation for completeness and accuracy. The project will be divided into milestones. A schedule for completing the milestones and evaluating your progress is provided at the end of your syllabus. Milestones are due, in my office by 5:00 PM, on the dates indicated. There are late penalties for milestones. Also, there are absolute deadlines for all milestones that you must meet or your ENTIRE team will automatically FAIL the course. The final project is due at the end of the semester and a one-letter penalty on the final course grade will be assessed on projects completed after the final due date. There will be absolutely no extensions to any deadline. The following milestones have been defined as follows:

1. Project Proposal (Given to you)

M1. System Profile and Development Procedure (Due: 9/19::9/23)

12. Documentation of Data and Work Flow Through the Current System (I will give you this)

M2. Design of Logical Data Requirements (Due: 10/6::10/10)

M3. Design of Data and Work Flow through the New System (Due: 10/27::10/31)

Building a Project Dictionary for Requirements

M4. Design of Computer Outputs, Inputs, On-Line Terminal Dialogues (Due: 11/14::11/19)

M5. Design of Computer Files/Database, Systems Methods and Procedures, and Packaging/Design of Computer Specifications (Due: 12/8::12/9)
The semester project will be graded on the **mastery** concept. The concept of mastery is new and unfamiliar to most of you. Basically, mastery requires that you demonstrate competency with respect to particular skills or knowledge. Mastery is easy to evaluate. Either you did master the skill or you didn't master the skill. There is no in between. To pass this course, you must master *all* milestones! Each completed milestone will be assigned a score between 0 and 20 commensurate with the quality and time taken to achieve mastery of the task.

When your team completes a milestone, you will submit it to your instructor. I will review your work and note problems (not solutions). There will be no points or grade assigned to the milestone. Either I sign-off or reject the milestone for additional work. **NOTE:** Sign-off means that you may proceed to the next milestone. You may have to comeback later and make revisions to a milestone that has already been signed-off. If rejected, you must rework the milestone, resubmit it, and get your instructor to sign it off before the absolute signoff deadline for that milestone. You may not proceed on to the next until you are signed off.

**DO NOT GET VERY FAR BEHIND! YOU MAY NOT CATCH UP!** Be prepared for a very hectic pace near the end of the semester. Students who have stayed on schedule will be rewarded by not having to work as hard at the end of the semester.

### PEER TEAM MEMBER EVALUATION

The prospect of working in teams carries with it the possibility that not all team members will put their fair share of the effort. For this reason, there will be two confidential **peer evaluations** during the semester. The first will be during a common lecture, sometime around midterm. The second evaluation will occur during finals week, after the project has been completed. Individual evaluations are the property of the instructor and will not be divulged to other team members under any circumstances - *your confidentiality is assured!* Only the cumulative average score received from all team members will be reported to the evaluated team member, upon request - and then, only after final course grades have been posted. Team member participation and contribution will be confidentially evaluated and calculated into the final grade. The instructor reserves the right to include an evaluation of team members. The instructor's evaluation, if included, will count as equal to one student team member's evaluation. Although the instructor reserves the right to adjust the grade in cases of gross injustice, grades are seldom changed.

Peer evaluations will account for half the project grade. Therefore, it is essential that you turn in your peer evaluations. The evaluator can not evaluate their own performance. Failure to turn in your peer evaluation will result in you receiving a failing grade for the project.

### GRADE (SUBJECT TO CHANGE GIVEN ADVANCE NOTICE)

Your grade in this course will be determined by your performance on four essential criteria: the semester project, two peer evaluations, quizzes, and a comprehensive final examination.

1. **You MUST submit an acceptable** semester team project by the date specified or you will receive an incomplete ("I"). If you receive an incomplete, you have until a specified date in the following semester to turn in an acceptable completed project, however, each team member will be penalized one letter grade on your final course grade for not completing the project on time. (You will receive one letter grade lower than what is shown in the decision table at the end of this syllabus).

2. The scores you receive from your team members on the midterm and final peer evaluation will be averaged. You will be assigned a letter grade for your evaluation corresponding to the university
grading scheme (i.e., 94-100= "A", 90-93="A-", etc.). For a detailed breakdown of the letter grades see the distribution list at the end. You will not have access to these evaluation scores; they are confidential.

3. At various times throughout the semester, there will be announced and unannounced assignments and quizzes over the assigned reading material. Regardless of the number of quizzes and assignments actually given, your total score on all quizzes and assignments will be scaled to be worth 100 points. The instructor reserves the right to use the percent of high student's score instead of percent of total possible (scaled in your favor).

4. There will be two exams. The first, a midterm, will be focusing on the chapters and reading material discussed until October 10. A final examination will be given at the end of the semester. Both exams will be worth 100 points each.

PROJECT MILESTONE AND DOCUMENTATION EVALUATION POLICIES
(SUBJECT TO CHANGE GIVEN ADVANCE NOTICE)

Before we discuss grading methods, let us examine some of the policies for grading. Regardless of the method of grading chosen, some policies are always in effect:

1. All milestones must be reworked until they are mastered (signed off). When resubmitting work, you must submit all the previously submitted drafts of that milestone.

2. If your instructor doesn't sign off on a milestone, you don't get an extension on the next milestone. It is due on schedule. It is to your advantage to make your first draft as close to perfect as possible since milestones can quickly begin to overlap each other.

3. Milestones must be completed (signed off) in sequence!! Of course, you can and should work ahead whenever possible.

4. You will submit your documentation in a three-ring, loose-leaf project workbook. All previous milestones must be included in the notebook with appropriate separator tabs. This is important since your instructor must cross-reference your previous work. Milestones must be arranged with the most recent work at the top. Bring your project workbook to all laboratory and instructor office meetings. Failure to include previous milestones will result in the material being returned ungraded and it will be assumed never to have been handed in, and therefore, late points may result.

5. All milestones must be of professional quality where professional standards are established by the instructor. Incomplete, sloppy, disorganized or unprofessional work will be returned ungraded and result in late points.

6. All submissions must be accompanied by a new walkthrough evaluation sheet and any previously returned walkthrough evaluation sheets.

7. Team proofing is recommended since it is more efficient with quicker turnaround than can possibly be provided by the instructor.

8. Any milestone submitted after its due date will result in a point per day penalty assessed against each member in the team. Weekends and vacation days DO NOT count. Partial team submissions are considered late for all team members.

9. There is no penalty for resubmissions; however, recall that there is an absolute deadline by which each milestone must be signed off. Failure to meet that deadline for any milestone will result in a failing grade for the course for all team members -- in other words, you can't put the entire project off until the last half or third of the semester.
Project milestones can be graded in one of two ways. First, milestones can be graded "live" in the form of a walkthrough. The following policies apply:

1. Walkthrough appointments must be made at least 24 hours in advance. You must specify a walkthrough appointment, request half hour, and submit ALL documents to your instructor at least 24 hours in advance.

2. If the documentation is not submitted at least 24 hours in advance, the walkthrough cannot be scheduled.

3. Walkthrough can be cancelled by the instructor without advance notice if the documentation is deemed unacceptable. Unacceptable submissions may be returned ungraded or incompletely graded.

4. At least two members of the team must be present to begin a walkthrough. Otherwise, the walkthrough is cancelled immediately.

5. A decision will be made on the material reviewed before the walkthrough concludes. That decision can range from signoff to resubmission with another walkthrough.

The second grading technique is submission for instructor evaluation, as soon as possible. The following policies apply:

1. One submission per day.

2. Anticipate a two day turn around. If you don't, you may lose several days of valuable time (if material returned ungraded or only reviewed). All projects are graded on a first-come, first served basis. Therefore, grading time will be reduced by submitting milestones early. Teams which are behind schedule will NOT be given any faster turnaround or priority.

3. The following notations are common:

NG Not graded for one or more of the following reasons: incomplete work submitted, prior submissions not included, prior milestones not submitted, quality not acceptable, not carefully proofed by the team, spelling errors, etc.

OK Generally acceptable and close to sign off. Minor corrections need to be made for sign off. Satisfactory submissions will be graded between 0 and 20 as stated earlier.

COURSE POLICIES.

1. Cheating Policy

Any student who cheats during an examination or who assists another student in cheating during an examination, will automatically fail the course. The case will also be forwarded to the Dean of Students for university action. Cheating includes, but is not limited to, crib sheets, copying answers from another student's exam, use of recording devices, use of calculators capable of storing alphanumeric data, and gaining unauthorized prior access to exams or answers.

Any student or team which cheats on a milestone, the final project or quiz or any student or team who assists another student or team to cheat on a milestone, the final project or quiz will automatically fail the course. The case will also be forwarded to the Dean of Students for university action. Cheating includes, but is not limited to, submitting any other person's work as your own (or any portion thereof), submitting any previous semester's project or milestone, copying another student's quiz answers, or similar offenses. If you have any doubt, ask your instructor before you submit the work as your own. After you submit the work, it is too late to
2. Lab Policy

The CASE tool, Oracle Designer, is on the machines in the computer labs and MIS classroom. The lab may be scheduled for other classes at times and it is your responsibility to schedule your work time accordingly. Normally, Friday class time is available for lab work.

3. Withdrawal Policy

You may drop this course any time up to the published university drop date. After the initial drop/add period, you will need your instructor's signature. This course is generally offered in the Fall and Spring semesters and is not available in Summer, even as an independent study.

4. Incompletes Policy

Incompletes will only be given under the following considerations:

- Documented illness or approved absence from the University (approval from the Dean of Students). In this situation, team deadlines remain firm, however, the individual is not directly penalized so long as any makeup work is completed within a period of time equal to the absence, beginning immediately after the absence.

OFFICE HOURS (SUBJECT TO CHANGE GIVEN NOTICE)

I am generally available during the posted office hours unless called away for departmental meetings, or other necessities. Appointments are encouraged (schedule at least one day in advance) and generally receive priority over walk-in. You can also reach me via email, voice mail, or IM.

TOPICS AND TENTATIVE SCHEDULE

The following topics are organized into units and lessons. The start of major course units is indicated by ALL CAPS. Each lesson is about 50 minutes. Normally, one lecture will encompass two lessons. A course and project calendar is included at the end of this syllabus.

1. The Systems Development Environment
2. The Origins of Software
3. Managing the Information Systems Project

Part 2: Planning (Weeks 8/29 – 9/12)
4. Identifying and Selecting Systems Development Projects
5. Initiating and Planning Systems Development Projects

Part 3: Analysis (Weeks 9/19 – 10/10) Mid term: October 12
6. Determining System Requirements
7. Structuring System Process Requirements
8. Structuring System Logic Requirement
9. Structuring System Data Requirements

Part 4: Design (Weeks 10/17 – 10/31)
10. Designing Databases
11. Designing Forms and Reports
12. Designing Interfaces and Dialogs
13. Finalizing Design Specifications
14. Designing Distributed and Internet Systems
**Part 5: Implementation and Maintenance (Weeks 11/7 – 12/5) Final : See exam schedule**

15. System Implementation
16. Maintaining Information Systems

**GRADING SCALE**

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