

**TEACHING UPPER LEVEL COMPUTER SCIENCE COURSES
VIA VIRTUAL CLASSROOM AND VIDEO**

COURSE REPORTS BY FACULTY

Computers and Society: CIS/STS 350 Starr Roxanne Hiltz

Systems Simulation: CIS 461 Julian M. Scher

Computer Applications Using Cobol: CIS 465 Michael Bieber

Computer Systems Management: CIS 455 Murray Turoff

Edited by Starr Roxanne Hiltz, Project Director

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Research Report Number 30



Introduction

New Jersey Institute of Technology is the grateful recipient of a generous grant from the Alfred P. Sloan Foundation which has enabled it to explore the use of asynchronous learning networks to create and deliver an entire undergraduate degree program in computer and information science. Each of these courses uses some amount of lecture-type material delivered via videotape. These materials are usually available to students in three different ways: by viewing broadcasts on a New Jersey cable station, by renting the set of videotapes, or by viewing in a special room in the library. Videotapes for distance learning are not new and are not, in themselves, a very effective means of delivery. The innovative part of this project is the Virtual ClassroomTM which is a specially tailored set of features embedded in New Jersey Institute of Technology's computer conferencing system, EIES (Electronic Information Exchange System). This makes possible a rich interchange and collaboration among students and faculty as they discuss and work through the problems and concepts in a course.

As of the spring of 1995, both the B.A.I.S and the B.S.C.S. are available to distance and on-campus students. Teaching in a Virtual Classroom mixed with other media (such as video or CD ROM) is not simple however. The purpose of the enclosed descriptions of experiences by faculty members is to familiarize prospective teachers using this media mix in the future with both some ideas for how to organize their online activities, and knowledge of problems that have been encountered. The faculty members were given a suggested outline of topics to include in their reports, but otherwise were free to include whatever they thought would be of most use to other faculty members in the future, teaching the same or similar courses.

Those who are interested in learning more about teaching and learning in ALN environments are referred to two book-length treatments: Starr Roxanne Hiltz, *The Virtual Classroom: Learning Without Limits via Computer Networks* (Ablex, Norwood NJ, 1994); and Linda Harasim, Starr Roxanne Hiltz, Lucio Teles and Murray Turoff, *Learning Networks: A Field Guide to Teaching and Learning Online* (MIT Press, 1995)

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Computers and Society via the Virtual Classroom plus Video: A Course Report

Starr Roxanne Hiltz
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This course is a requirement for the B.S. in Computer Science, and a recommended elective course for the BAIS and the BACS. In addition, it fulfills a general university requirement as an option, and is a recommended course for majors in STS (Science, Technology, and Society.) Thus, enrollment pressures are fairly high.

COURSE OBJECTIVES:

A complete syllabus is appended at the end of this report. The objectives include:

1. Familiarization with the variety of topics and studies in the area of Computers and Society, including the history of computer science and of computer applications; computers and psychological effects; uses and impacts in the workplace, in government, education, and medicine; computers and the law; and the ACM related codes of ethics for professional conduct.
2. Ability to critically read and understand the professional literature in the field, in journals such as Communications of the ACM. By critical reading is meant reading with the questions in mind, "How valid and GENERALIZABLE are these results? Might they be limited to a specific type of computer system, a specific social context, or a specific type of implementation? Was the author biased in any way?"
3. Ability to describe and discuss ethical and legal issues for computer science as a profession.
4. A permanent change in the scope of the issues and choices students will consider, when they are in the position of designing or implementing or managing a computer system in the future, so that they will act in a socially responsible manner.

Coverage of the above topics is required for an accredited degree in Computer Science. However, until a few years ago, most computer science degrees included only technical courses (programming, etc.) and did not include any course work with these objectives.

This is the only course in the department that requires students to read in the professional journal literature, and to write essay-type assignments and reports. There is generally about 100 pages of reading a week; one to one and a half hours of lecture (depending on delivery mode); ten weekly assignments; a term project that requires about 30 hours of work; and a midterm and a final. This is a large work load, easily reaching the 9 to ten hours a week of total work that a course is "supposed" to require, but which many courses do not actually take, every week. Students who do not have good skills in English, in particular, tend to find these requirements to be very burdensome and time consuming. In addition, only a few students (generally the STS majors) are taking the course because they are interested in the topic; the vast majority are enrolled only because it is required for graduation. Thus, getting students to do this work, in any mode of course delivery, is an "uphill battle."

DELIVERY MODES DURING 1993-94

For the last few years, this course has been taught with one lecture/ face to face class meeting a week (1 hour 25 minutes) plus all assignments and discussions online. One hour of the lecture each week was filmed in the "candid classroom" during the spring of 1993. In the fall of 1993, I taught the first section via Video + Virtual Classroom, with on-campus meetings only for the midterm and the final exams . It enrolled the full 30 students for which the enrollment "cap" was set.

In both the fall and the spring, a Ph.D. student, Cesar Perez, also offered a section of the course, in the evenings, via "ftf" and Virtual Classroom. The assignments and online "electures" are the same in all sections.

In the spring, the Video + VC section was inadvertently omitted from the course schedule, so only "late enrollment" students could register. A total of only 14 enrolled; some of these were late enrollments. A face-to-face section enrolled its limit of 25. In order to manage a teaching overload, both these sections were combined in the same online set of conferences (perhaps a mistake). (Note that students who initially enroll but drop during the first week of the course are "disappear" from the records; and the "W" is not shown on their transcripts).

In addition, in the summer of 1994, CIS 350 was offered via Video plus VC; it enrolled its limit of 25 the first day or two of pre-registration, and a waiting list was kept. The instructor, Cesar Perez, was offered extra compensation by the Chairperson of CIS to teach a double section; he agreed, and the initial enrollment zoomed up to the new limit of 50 students quite quickly. Mr. Perez has been asked to write his own report on his experiences handling this deluge of students.

In terms of objective performance of students, I do not perceive any difference, though a slightly higher proportion of totally "distance" students seem to be "no-shows" who become official or unofficial withdrawals. The same grading standards are used in both modes of delivery, though a little more leeway in term of granting individual excuses for extensions of due dates on assignments is granted to the Video + VC section students. Below is the historical "scoreboard" from grade sheets, for four sections. "93 ftf" refers to the section which met and was videotaped; "93 video" refers to the fall section of Video + VC; "94 ftf" refers to the spring 1994 ftf + VC section; and "94 Video" refers to the Spring 1994 Video + VC offering.

GRADE	93 ftf	93 video	94 ftf	94 video
A	4	2	7	3
B's	11	7	4	0
C-D	6	3	5	2
F	2	2	2	2
W	4	14	6	5
Inc	1	1	1	2
TOTAL	28	29	25	14

There seem to be fewer "A" students in the distance sections, but the sample is too small to determine if this is significant. The only major difference in performance is that the distance section students are MUCH more likely to withdraw. Telephone conversations, in-person visits of withdrawing students, and the results of "dropout interviews" and questionnaires indicate that the main reason seems to be that the students initially think they will be able to fit "one more" course into their busy lives if it is taken in the Video + VC mode. However, they subsequently learn that the course will in fact take 8-10 hours a week, every week; and they are unable or unwilling to devote that much time to the course on a regular basis. Many of these students seem to be "precariously" enrolled; whether they will have the time, skills and self discipline to complete a course, let alone a degree program, seems to be more problematic than for students enrolled in the traditional sections, who are much more likely to be "full time" students without major job commitments.

REACTIONS TO ONLINE ASSIGNMENTS

The first assignment is given during the very first week of the course, and responses and grades are promptly assigned, in order to make it clear to the students that the instructor is "serious" about requiring a written assignment (generally the equivalent of one to three pages, typewritten, double spaced) each week. Usually only about half of the students do this assignment completely and on time; many of the laggards then rush to complete the assignment when a poor grade or a zero is posted for them. An attempt is made to balance this "negative reinforcement" with praise and response for those who reply promptly and well; however, it seems that shaking a grading stick early in the semester is necessary in order to show the students that the instructor is "serious" about weekly assignments and due dates.

In both modes of delivery, so many students begin lagging behind that grading becomes a real chore by mid-semester, with the necessity to note and grade late assignments and redone assignments (students have the option of redoing most assignments, but cannot achieve a grade higher than "90" on a redone assignment.) The logistics become so difficult, without a teaching assistant, that in the coming year, the number of assignments is going to be cut slightly (probably from ten to eight).

The most enthusiastically received assignment is always "the debate." This has been conducted in several ways. In the spring of 1993, sides of the debate were assigned, with one section competing against the other. This seems to be the most motivational strategy, but can only be done if both sections reach the "debate" stage at the same time in the semester.

Another moderately well-received assignment, with collaborative aspects, is the "review," in which students or pairs of students present a summary, critique, and questions for discussion on an article which they "read for the class." Then a second grade is assigned for responding to the questions/reviews of other students.

Students have a choice of completing 25 hours of community service and writing a short report, as a term project, of or doing a "term paper" about 25 pages in length. The term paper must be an in-depth exploration of a narrow topic (such as "computers and the blind," but not "computers and the handicapped," which is too broad.) Students do not LIKE to do a term paper; generally, this is the first and only one they will do as CIS majors. However, I feel tht it is "good for" them to have to plan, research, and write a major paper; it helps to prepare them for a professional position. The alternate assignment, which involves practicing "professional responsibility" by helping a community service agency to make better use of

community resources, is usually better received, by those who choose this option. However, students who already have a full time job generally cannot fit the community service option into their schedules.

A special conference is set up for those in community service placements, where they are to report in periodically about how computers are being used in their agencies, problems observed, what they are trying to accomplish, and information they need to help them accomplish these objectives. The students are very good about helping one another out with suggestions about appropriate hardware, software, or strategies for accomplishing their objectives with the limited resources available to the agencies.

The least well received assignments are those which are basically just an individual essay based on readings for the week. The students can read each others' responses after they reply, but this does not seem too "exciting." I would like to eliminate most of these in favor of more assignments that are truly "collaborative" in nature, but have not been able to come up with ideas for new types of collaborative assignments that would fit the topics and materials. This is particularly true with large numbers of students to manage. If I ever have a semester with a total of 20 or fewer students, I will try some role playing scenarios for the ethics and law units. However, with large numbers of students, the interaction for this seems too hard to design and manage. It would also be necessary to have the "pen name" feature in order to role play; I have added this to the list of development objectives related to the project.

In addition to the set assignments, students are informed that they are required to make at least one comment contributing to the class conference(s) each week. This can be a question on the readings or lecture; something they have read or observed that is relevant to the course; or a response to another student's question or comment. One "class participation" grade is given for the first half of the course, and one for the second half. During the first semester, most students did not contribute these "free discussion" comments. In order to motivate them, during the second semester, a gradebook grade was set up for each of the six week periods before and after midterm week. Each week, the student was given up to 20 points for their contributions to the conference during the previous week. This was posted weekly but "weighted" at zero until the grade was complete. This seemed to motivate more widespread and regular participation, but was very time consuming to grade each week in addition to the regular assignment or exam grading.

It would be very beneficial to have a qualified graduate student to serve as a TA/"grader" in large or double online sections. This was possible during the second semester, when I made my own arrangements to find and compensate a student. There is currently no money in the department budget each year, apparently, to provide online teaching assistants. However, especially when there is an "overload" or heavy enrollment situation, and the alternative would be to hire another instructor, it would seem that it would be a good idea to FIND the funds. It is cheaper to pay a good graduate student "adjunct" fees for being a teaching assistant, than to pay a full time instructor the equivalent of "two sections" of teaching, by far. One area that does need future exploration, is the extent to which some of the work of grading and of daily responses to students online, can be shared with a competent but much lower-paid teaching assistant, in order to decrease the "per student cost" of offering these video + VC courses.

SUMMARY

A course like Computers and Society requires students to be able to carefully think out their positions on issues, and to discuss them with others, in order to make the topics a part of their thinking. It definitely does not require three hours a week of "lecture." That is why I have always taught the course with a VC component; with 25 or 30 students in a section, most students do not have an opportunity to participate actively in face to face discussions, but they do have this opportunity online.

I am so TIRED of giving pretty much the same lectures, after ten semesters of this course, that I much prefer the Video + VC mode. I find that the comments prepared online are much "deeper" and interesting than the off the cuff comments made in class. I especially enjoy the "real life" experiences often brought to the online discussion by the distance students, who are more likely to have broader experiences to share than the traditional students.

If there are one or two students who are enthusiastic and participate frequently from the beginning, they seem to "spark" the online interaction. Otherwise, it is more difficult to develop and sustain a lively set of discussions, that go beyond the set assignments. This just seems to be "the luck of the draw" but is more likely to happen with 20 students than with less than ten students.

CIS 350/COMPUTERS AND SOCIETY/NJIT
Distance sections, 1993-94
Prof. Starr Roxanne Hiltz

COURSE OBJECTIVES:

1. Familiarization with the variety of topics and studies in the area of Computers and Society.
2. Ability to critically read and understand the professional literature in the field, in journals such as Communications of the ACM (abbreviated as CACM in the reading list below). By critical reading is meant reading with the questions in mind, "How valid and generalizable are these results? Might they be limited to a specific type of computer system, a specific social context, or a specific type of implementation? Was the author biased in any way?"
3. Ability to describe and discuss ethical and legal issues for computer science as a profession.
4. A permanent change in the scope of the issues and choices you will consider, when you are in the position of designing or implementing or managing a computer system in the future.

Required Reading:

Text: Richard Rosenberg, *The Social Impact of Computers*, Academic Press, 1992.

Articles: All articles are in a binder for sale (probably from the bookstore.)

Recommended materials:

EIES 2 Starting Guide

Course notes (copies of overheads or visuals)

All students will have an account on EIES 2 as part of this course. It is planned that approximately 1/2 of the coursework will be conducted online. You are expected to spend about four hours a week working in the "virtual classroom," and to "sign-in" AT LEAST twice a week. All assignments will be "handed in" online, where other students may see them and benefit from your contributions. You may also send questions to the instructor at any time ("electronic office hours").

The following is a "draft" syllabus. Readings, assignments and test dates as well as weighting of grades for your final average are subject to change as opportunities and problems occur.

UNIT 1: TECHNOLOGICAL ADVANCES AND SOCIAL CHOICES:
APPROACHES TO THE STUDY OF COMPUTERS AND SOCIETY

I. History and Theory: Weeks 1 and 2)

A. A brief history of computers, computer science, and the field of computers and society.

Rosenberg, Chapters 1 and 3

B. Approaches to the study of computers and society

Rosenberg, Chapter 2

Rob Kling, "Social Analyses of Computing," *Computing Surveys*, March 1980, 61-69, 100-110

Kemeny, *Man and the Computer*, pages 3-20.

Weizenbaum, "Human Choices in the Interstices of the Megamachine", in *Human Choice and Computers*, 2, 271-278.

Herbert Simon, "The Steam Engine and the Computer: What Makes Technology Revolutionary?" *EDUCOM Bulletin*, Spring 1987, pages 2-5

II. Computers and Work

A. Computers, Organizations, Productivity and Employment
Weeks 3 & 4

Rosenberg, Chapt. 4, 10 and 12.

Irving et. al., "Computerized Performance Monitoring Systems," *CACM* August 1986. (Look at this in terms of methods of data collection and analysis as well as content).

Attewell and Rule, "Computing and Organizations: What We Know and What We Don't Know," *CACM*, December 1984

George and King, "Examining the computing and centralization debate," *CACM*, July 1991, 63-72.

Gilchrist and Shenkin, *CACM* July 1982; Also Gilcrest and Shenkin, *Computers and Society*, Winter 1982 [1].

B. Commute or Telecompute? (Week 5)

Rosenberg, Chapt. 13, "The Information Society"

Renfro, "Second Thoughts on Moving the Office Home", The Futurist, June 1982

Dixbury, Higgins & Mills, "After-Hours Telecommuting and Work-Family Conflict: A Comparative Analysis," J. MIS, June 1992

Turoff, Hiltz and Mills, Telecomputing: Organizational Impacts, book chapter

III Computers and Government

Weeks 6 & 7

Rosenberg, Chapters 7 and 11

Kling, "Automated Welfare Tracking" CACM June 1978

Danziger, "Computers, Local Governments, and the Litany to EDP," Public Administration Review, 1977, 28-37 .

Dutton and Kraemer, "Automating Bias," Transaction, 1980, 36-41 .

Borning, "Computer System Reliability and Nuclear War," CACM Feb. 1987

MIDTERM EXAM COMES ABOUT HERE

IV. Education, Health, EFT, and Equity Issues

Weeks 8 & 9

Rosenberg, Chapters 5 and 6

Haas, "Reading and Writing with Computers," CACM Sept 1988.

Gardner, "Tomorrow's Electronic Hospital is Here Today," Spectrum, 1984 .

Kling and Lundegaard, "Passing the Digital Buck", Society, Jan/Feb 1980: 42-49.

Hiltz and Turoff, "More Inequality? An Exploration of the Potential Impacts of EFT on Social Stratification in American Society" Telecommunications Policy, March 1978

Frenkel, "Women and Computing," CACM, November 1990

V. Ethical Issues: Crime, Privacy, Civil Liberties, and Security
Weeks 10-13

Rosenberg, Chapters 8 and 9

Laudon, "Data Quality and Due Process in Large Interorganizational Record Systems," CACM Jan. 1986 .

Aner, "Privacy and data protection legislation," Human Choice and Computers, 2, 151- 165 .

Shattuck and Kusserow, "Computer Matching: Should it be Banned?" CACM June 1984 .

Rob Kling, "Computer Abuse and Computer Crime as Organizational Activities," Computer/Law Journal, 1980 .

Articles by Jay Becker on Computer Crime, Computers and Society, 1982 .

Shore, "Why I never Met a Programmer I could trust," CACM, April 1988 .

Anderson, Johnson, Goterban & Perrole, "Using the New ACM Code of Ethics in Decision Making," CACM, Feb. 93, 98-107.

Rosenberg, Chapter 14

Straub & Collins, Key Information Liability Issues, MISQ June 1990

Mykytyn, Mykytyn, and Slinkman, "Expert Systems: A Question of Liability?" MIS Quarterly, March 1990, 27-42.

VI. Computer Applications, Social Responsibility, and the Future
Week 14

Read the CACM August 1989 section on "computing and social responsibility," pages 925-956, including--

Berman and Hafner, "The Potential of Artificial Intelligence to Help Solve the Crisis in our Legal System," CACM Aug 1989

Buesmans & Wieckert, "Computer Research and War."

Ladner, "Computer Accessibility for Federal Workers with Disabilities"

"Computing the Future," CACM, Nov. 1992, pp. 30-40.

COMPUTERS AND SOCIETY: GRADING AND ASSIGNMENTS

Grading: Midterm Exam 15%; Final Project & Exam 35%; ASSIGNMENTS AND CLASSWORK 50%. There will be one assignment every one or two weeks.

If you miss an exam, contact the instructor immediately to arrange for a makeup. Makeup exams will generally be harder than the regular exam, and you may be asked for proof of illness or family emergency in order to be allowed to take a makeup.

Any evidence of cheating in any form, including plagiarism, will be dealt with according to the honor code of NJIT. Assignments must use standard citations and references to acknowledge the source of ideas or materials used in the assignments. In the text one uses "(author, date)" and then lists all citations in alphabetical order by author at the end of the assignment.

CLASS ASSIGNMENTS:

General Policy: You will be penalized 2 points a day, or ten points a week, for unexcused latenesses. Some assignments need to be completed by certain dates to receive any credit at all. No late assignments may be turned in after the last day of the class for credit. It may be possible to re-do an assignment for a better grade; ask; but in no case will a redone assignment receive a grade higher than 90.

Tentative assignments, subject to change:

1. Orientation to the Virtual Classroom. Your first week should be spent in becoming familiar with the use of EIES 2. This can require one to three hours of practice. There will be a message from me waiting on EIES2, with initial instructions. View it, and do what it says! Additional questions and activities to complete will be in your class conference. You will see them during your first interaction with the system.

2. Computerphobes and Computerphiles: Points of View

This will be a "response branch" on EIES 2. It will deal with the assigned articles. You will choose two of the three pieces by Simon, Weitzenbaum, and Kemeny, and analyze and contrast them according to a question that will be placed in the conference. Because they will be placed in a "response branch," you will not be able to read the responses of the other students until you have entered your own essay. Expected length: 50 to 100 lines, well thought out and edited for ease of reading.

This is DUE the end of the second week of the course. The end of a week is defined as Sunday at midnight.

3. Impacts on white collar workers- DUE by the end of the fourth week.

3-4. Student Reviews

Students will be required to each review a PROFESSIONAL article relevant to the topic of Computers and Society, which is not included in the list of required readings. A partial list will be available online from which the students may select their individual unique choice. Those students not selecting from this list or too late to make a selection will have to find an article on their own. The proposed selection should be listed in a response branch that will be set up for "additional selections;" make sure nobody else has previously listed the article you propose to use. You will be told if your proposed selection is suitable.

Students will present the main ideas in the article and ask a question about it. One grade will be assigned for the quality of the presentation. Then you are to respond to at least two of the questions posed by other students. The second grade will be on the responses to these questions. Online presentations of the reviews will be due by the end of the fifth week and responses at the end of the sixth week. The instructor may base some exam questions on some of these reviews.

5-6. ON-LINE DEBATE

This will be a debate upon the role of government in the regulation of Computer and Information Systems. You will be required to make a minimum of two entries. The first must be an expression of your own position in this debate. The second must be an argument against someone else's entry. Each entry must be no more than 50 lines. One is free to make more than two entries.

7-8 Conference participation. Two grades will be given for the quality, quantity and regularity of your participation in the online discussions (outside of the required assignments). One will be given for the first 6 weeks or so, and one for the 6 weeks after the midterm exam.

9-10 Student final project

Each student will pick a topic upon which to base a final report. This may be a field placement in a community service agency, or a term paper on "computers and..." By the end of the tenth week the student must prepare a "proposal" for that report. This proposal will be a 1/2 page description of the topic, a suggested table of contents for the report and a list of three professional references the student has found about that topic. These proposals will be put online.

Each student will be required to prepare an "executive summary" online of their final report two weeks before the end of the semester. The instructors will designate certain reports for presentation during the last week of the course.

CIS461 (Systems Simulation) via VC+Video: A Course Summary Report,

Julian M. Scher
September, 1995

OVERVIEW

CIS461, Systems Simulation, is a senior level CIS elective course for students enrolled in the BA in Information Systems curriculum, as well as for students enrolled in the BS and BA in Computer Science curricula. Because systems simulation is a tool which is used in many disciplines, the computer science prerequisites for CIS461 have been kept rather minimal, and consist of both fluency in one higher level language (which is generally fulfilled by students completing a GUR course, such as CIS113 or CIS101) and a working knowledge of the fundamentals of probability and statistics (including continuous probability models which requires a knowledge of differential and integral calculus), and students generally fulfill this latter requirement with MATH333.

The goals of CIS461 are to introduce the student to the probabilistic and statistical methodologies used in discrete event systems simulation, to give the student experience in using systems simulation as a tool in the design and analysis of systems from a variety of contexts, and to expose the student to the design and utilization of special purpose simulation languages for discrete event simulation studies. Systems simulation is, therefore, a very technical, analytical and software-oriented course, as opposed to a discussion oriented course.

Students enrolling in CIS461 are required to purchase two textbooks. One textbook ("Discrete Event Systems Simulation") deals with the probabilistic and statistical methodologies used in discrete event systems simulation. The second textbook ("Getting Started With GPSS/H") focuses on GPSS (General Purpose Simulation System) which is the most widely used special purpose simulation language - the textbook includes a floppy disk containing a student version of GPSS/H, which is a DOS based program.

In the Fall of 1994, as part of the Sloan Foundation grant awarded to NJIT, I offered CIS461 in NJIT's Candid Classroom, where my lectures were videotaped, producing a set of 25 one-hour video tapes containing lectures and content almost equivalent to the course as had been traditionally presented. In the Spring of 1995, this course was offered to Distance Learners, using the Virtual Classroom on EIES2 and the 25 video tapes (which were presented on a New Jersey cable television station, as well as made available on-campus and for purchase and/or loan).

STUDENT ENROLLMENT

In Fall, 1994, CIS461 was offered with meetings on Wednesday and Friday, and only five students enrolled. One of the students dropped the course at the midpoint of the semester, as he indicated to me that he had obtained a full time job which required him to drop all of his classes which met during the day. In the Spring of 1995, CIS461 was offered as a Distance Learning section, and twenty students enrolled in the course. Within a few weeks, five students withdrew from the course and, of the fifteen students who remained, a perusal of the conferences and completed assignments indicated that fourteen of these fifteen students maintained a more than adequate level of currency and completeness in the class. The one student who was inactive spoke to me - she was a Rutgers student who acknowledged that she had become too active in student activities and could not keep up with her work. Of the fourteen students who were active, I was extremely satisfied with the work of thirteen of these students, all of whom completed most of the assignments, participated in the discussions on a timely basis, and performed reasonably well on the two examinations.

All of the students enrolled in the Distance Learning Section in Spring, 1995, were regular NJIT students who enrolled in this section both because they wished to learn Systems Simulation AND there was no face-to-face traditional section offered. Many of these students had part-time jobs or full time jobs, and presumably welcomed the flexibility inherent in a virtual classroom distance learning section. It is interesting to note that approximately 50% of the students who enrolled in the video+virtual classroom section in Spring 1995 were majoring in a discipline other than computer science or information systems - generally this group included actuarial science and statistics majors and computer engineering majors. While in prior semesters CIS461 has generally attracted a good number of students whose major is not in CIS, far more so than most other CIS electives, it might well be that the significantly high percentage in Spring, 1995 of out-of-department students could be due to the fact that the scheduling of the video+vc section of CIS461 would not conflict with any of the regular courses that these students would be taking within their majors.

Given the small sample size in the Fall, 1994 semester section, any comparisons with the Spring, 1995 sections must be interpreted with great caution. Numerically, the number of students enrolling in the video+vc version (20) was 4 times as great as the number of students enrolled in the traditional section(5). The completion rates, 80% for the face-to-face section versus 75% for the video+vc section, are comparable and generally in line with what I have experienced for this course in prior semesters. In terms of performance, 50% of the students (2 of 4) who successfully completed CIS461 in the Fall semester received A's, but this rather high percentage must be interpreted carefully. These two students had previously completed CIS431

(Database Systems Design and Management) with me and received grades of 'A' in that course, and were at the top of the Database class of about 40 students. Overall, the performance of students in the video+vc section generally matched the performance of students in the regular sections of Systems Simulation which I have taught for over twenty years.

The distribution of grades in the CIS461 Video+VC Section was:

Grade	Number
A	5
B+	1
B	6
C+	1
C	0
D	1
F	1
W	4

PRELIMINARY DESIGN GOALS FOR THE VIDEO+VC SECTION OF CIS461

In planning for the virtual classroom section, I carefully considered the options for structuring the course, and decided upon a model whereby there would be distinct conference for distinct purposes. My feeling was that to place all discussion items in a single conference would create a "hodgepodge" and unfocused view of what we hoped to accomplish in this new mode of course delivery and, further, I wished to separate the very serious material from the more informal material.

From discussions with other individuals who had instructed video+virtual classroom courses, I felt it would be imperative to establish the policies which would encourage and require students to "log on" and partake in the spirit of the virtual classroom. The need to habitualize the students to "log-ons" on a regular basis was clearly spelled out at the start of the semester. Moreover, I encountered somewhat the ire of the Distance Learning Division by not providing the students at the beginning off the semester with a complete week-by-week detailed outline of required reading and viewing, as well as the written assignments (this apparently was the traditional policy followed for Distance Learning students.) My feeling was that if students had available beforehand all of the reading and written assignments, this would make it less imperative for them to conform to the pattern I was seeking to achieve, of log-ins on a regular basis.

As such, at the beginning of the course, I devoted part of a video lecture to an overview of the course contents. In the conference discussions for the course, I indicated that students were to log-in on a regular basis, and in one of the

"special" conferences I would be providing the requisite reading assignments from the textbooks(s), which videos were to be seen, the written assignment, and the due date. In retrospect, I feel that this policy is an excellent one for a virtual classroom course, as opposed to an "a priori" establishment of all assignments and due dates.

THE CONFERENCES

Four conferences were established for the course, of the form C461.X (i.e., 461.1,461.2,461.3,461.4). As noted previously, each of these four conferences would focus on a particular aspect of the course. In each of these conferences, I, as the instructor, would enter the first several comments in the conference, where I would describe the focus of the particular conference, and an example of the items which I would want the students to enter into the conference. Thus, for the "Introduce Yourself" conference (C461.1), I provided a personal and academic description of myself to serve as a model for the student entries, and, for the "Simulate the Professor" Conference (C461.4) I provided a set of representative questions and answers which again would serve as a model for the students.

An overview of the 4 Conferences is as follows:

a) C461.1 was the "Introduce Yourself" Conference. As part of the first week's assignment, each student was to enter a comment to introduce himself/herself using the given model, describing personal information such as their home town, high school, major at NJIT/Rutgers, computers they have access to and favorite software programs, and anything else they wished to share with their classmates. Students were encouraged to reply to (either publicly or privately) to any other student in the conference.

I was pleasantly surprised by the conference entries in this conference (just about all the students entered something in this conference). Some of the conference entries were very touching, such as the student who recently emigrated to the United States with her mother and described how difficult it was to leave all her friends behind and begin a new life in America. Another student described some trepidations in using the EIES2 Conferencing System. In these and other cases, there was clear evidence of classmates who "reached out" and responded to these students with words of encouragement and camaraderie.

b) C461.2 was the "Assignments" Conference, where I would post assignments on a weekly or bi-weekly basis. Each assignment consisted of an overview of the material to be covered and some motivation for the material, the appropriate

videos which were to be seen, the sections in our textbook(s) which were "linked" to the videos and were to be read in conjunction with the videos, and the written assignments which were to be submitted before a specified date. As always, students were encouraged to ask questions (either within the conference or in private messages) which they may have regarding the assignment, or comments related to the assignment.

One particular set of comments which comes to mind concerns a particularly challenging programming assignment I gave on a simulation implementation. One of the students, who had superbly completed the prior assignments, entered a comment into the conference politely asking if it would be possible to have an extension beyond the specified due date for this assignment. This was immediately followed by another comment politely supporting the first request for an extension. After careful consideration, I entered a comment indicating that the requested extension would be granted. Almost immediately, this was followed by several "thank you so much" entries from students who well appreciated the extra time they were being given to do the assignment (this sort of satisfying feedback is not always present in traditional face to face meetings!).

c) C461.3 was the "Administration" conference, devoted to administrative issues related to the presentation of the course. It was the place where I posted announcements related to CIS461, such as the dates of the midterm and final exam and information relating to the structure of these exams.

d) C461.4 was the "Simulate the Professor" Conference. As described to the students in the opening remarks to this conference, preparing the questions for an exam was a difficult task for the college professor, for the questions are the key components of a measurement instrument used to gauge the student's understanding of the material and the insight gained in the course, and yet the questions had to be "fair" in the sense that they would be a "reliable" indicator of student achievement and understanding. As such, each student was required to "simulate the professor" and enter three separate questions for the midterm exam (and subsequently for the final examination). Moreover, in addition to entering their own questions, each student was required to answer three questions posed by other students. Lastly, the student posing the questions was required to evaluate the answers of any and all students who answered these questions. Students would receive a grade for their participation in the "Simulate the Professor" conference which would count towards their final grade at twice the weight of a regular assignment for both the midterm and final exam. To further encourage student participation in this conference, I promised that most of the questions on the midterm exam and the final exam would be based on questions posted by students in these conferences (and I kept my promise here!)

COURSE ORIENTATION AND THE CRITICAL FIRST WEEK

Students were (supposedly) invited, by Distance Learning, to attend an orientation session I held during the first week of the semester. Unfortunately, no students showed up at the designated date and time (several students indicated they had not been notified of the date and time by Distance Learning). Rather than designate an additional specified date and time, I offered to meet individually with any student, at their convenience, on a one-to-one basis, to orient them to the functionality of the EIES2 conferencing system. Approximately one third of the class took advantage of this opportunity, and I met with each of them on a one-to-one basis (in one case, a one-to-two basis) and gave them a one-hour on-line tutorial on EIES2 functionality. Almost all of the students who came were Actuarial Science and Statistics majors with minimal computer experience other than CIS113-114. The other students in the class (all of whom were either in their junior or senior year) were Computer Science or Computer Engineering majors who had either completed a prior video+vc course or used EIES in some other course, or else were able to sufficiently learn EIES through use of the printed materials or on-line materials.

During the first week of classes, I checked to see if each enrolled student had logged on to EIES2. If a student was on EIES, I sent that student a warm welcome message, pointed out to the student the appropriate conferences for the class, and requested that the student send me a message indicating that they successfully logged onto EIES2. If a student was not on EIES, then using the class roster and phone numbers provided by the Office of Distance Learning, I telephoned the student to discuss the log-on protocols and whatever else was needed. Most students logged on without my calling, and only a small handful required a call.

ASSIGNMENT POLICY AND IMPRESSIONS

As previously indicated, each assignment was posted in the Assignment Conference, with a specified due date. Every assignment was carefully prepared to enhance the student's understanding of crucial technical issues presented in the course. The assignments given were comparable to what would have been offered in a traditional face-to-face section. Students were offered the choice of the following three methods for submitting the written assignments:

- o in a private message on EIES2
- o through the U.S. mail (a.k.a. "snail mail")
- o hand delivered to the CIS Department

All assignments were graded and returned to the students with comments.

Most students either hand delivered their assignment to me, or submitted them via EIES2 private messages. The few students who submitted their assignments through the U.S. mail requested that I return them likewise, which I did.

One significant adjustment which I had to make was the receipt of the student assignments in a non-batch mode. In traditional classes, with a fixed due date for assignments, the instructor receives the student assignments in one batch, and grades them together in one batch in order to assure consistency of grading. In the video+vc section I offered, with the multiple means of submitting assignments, it is tempting to grade the assignments in a non-batch mode upon receipt of each assignment. Doing this poses some danger, indeed, to the desired consistency and integrity of the grading process. As such, I found it desirable to resist the temptation to immediately grade a received assignment, and instead waited for receipt of the entire "batch" of assignments, which did result in some delay of grading for those who submitted their assignments early (or, in the case where extensions of time were given, to assignments submitted on time).

FACE TO FACE ENCOUNTERS

Several students in the class did seem to have an inkling to supplement the "electronic" form of communication with some face-to-face meetings. While assignments could have been readily submitted by U.S. mail or private messages, several students took the time to make the trip to my office to proudly present to me their completed assignments. I'd venture to guess that these students wanted to personalize the process a bit more than I had originally intended. We did spend some time chatting and I suspect that the individual submission gave these students a bit more of a personal accomplishment than the batch submission in the traditional classroom.

After grading the midterm examination, and in accordance with my feelings that the midterm exam is both a learning experience as well as a measurement instrument, I decided to have an optional face-to-face class with the students, during Wednesday afternoon "club hours," and posted this item in the Administration Conference. It was emphasized that this was optional, and if a student could not attend I would return the graded examination in any way the student requested. Approximately one half of the class was present for this optional meeting, where I returned the examinations and reviewed with the class the answers to each of the questions on the midterm exam.

Subsequent to the review discussion, a few students expressed some concerns with the protocols of the "Simulate The Professor" Conference. The issue was the timeliness and time constraints - students felt pressured having to grade fellow student answers a few days before the exam, and students felt additionally pressured having to gather the

correct(ed) answers of other students just a couple of days before the exam (recall that the midterm exam was based on questions posed in "Simulate The Professor").

Based upon this feedback, I revised the procedures for the "Simulate the Professor" conference for the final examination. Each student was required, as before, to post three questions for the examination, one question per conference comment. However, the student would now be required to answer each question they posed, rather than answering another student's question. While this diminished somewhat the student-to-student interaction, I felt this was necessary given the greater pressures facing students in the weeks before comprehensive final examinations.

EXAMINATIONS

As stated previously, the midterm examination and final examination were mostly based on questions posed (and answered) by students in the "Simulate the Professor" conference, C461.4. Each student was required to post three questions in this conference, relevant to the material covered in the videos and text readings. For the midterm examination, each student was required to answer three questions posed by other students, as well as to "grade" any students who responded to their questions. This policy was modified for the final exam, whereby each student would answer the questions that they posed. I monitored the questions and answers of the students, sometimes prompting the students when I felt their questions were unclear or ambiguous. The cleverness and correctness of the student participation in this activity was evaluated and graded by me, and counted towards the student's grade for the course.

I feel that this interactive, participatory examination creation activity was a significant success, and a particularly valuable learning experience for the students. Many of the questions posed by students were unique, insightful and very clever; having taught this course for over twenty years, I am always looking to enhance the level of questions I present on examinations, and this video+vc course in effect provided me with 15 or so students helping to create some excellent questions (in fact, I intend to modify some of the questions and use them again on examinations in regular sections of the course).

This activity also provided the students with an excellent review for the midterm and final examination. The process of creating clear, unambiguous and non-trivial questions inspired the student to review the material in an insightful manner. After all students had posted their questions, the compendium served as an excellent comprehensive problem-oriented review of the material for the respective examinations.

PERSONAL CHALLENGES AND OBSTACLES I HAD TO OVERCOME

No discussion of personal satisfaction achieved and accomplishments would be complete without a review of the personal challenges and obstacles which had to be overcome during the past year in both preparing the videos using the presentation graphics software, and doing the on-line interaction with the students. In a nutshell, the overriding obstacle throughout the year was the lack of a personal computer in my office capable of running the Windows-based presentation graphics software and effectively preparing material for the on-line sessions. (The personal computer in my office was an obsolete, rarely used and snail-slow 286 machine with NO hard drive, 1 meg of RAM, 5.25" floppy drives and an ancient eye-straining EGA monitor. This situation was extensively discussed with the Department Chairman, both prior to the preparation for the course as well as during the course, but unfortunately the Chairman could not allocate the resources to support this.) While it certainly would have optimized both performance and productivity to work from a Windows-capable personal computer in my office, I did manage to "get by" through my personal home computing resources, and by waiting for the secretaries to go to lunch to use their machines, as well as on occasion using the computers in the Co-Lab.

Thus, given the futility of using the CIS Department assigned PC in my office, I was virtually forced to work mostly from home for the video+vc course, where I would have to meet the challenge of minimizing my communication costs (since I do not reside in New Jersey). I had discussed this concern with Eric Santanen, an MSCS student who had designed and implemented OEI (Offline EIES Interface), and I decided that OEI would be my means of implementing the on-line course. (Eric was a student of mine in CIS661, and I had the highest regard for the quality of his work.) I was very excited about the graphical user interface in OEI and, on paper, the capability to easily upload, download, and retrieve items seemed ideal for my needs in the virtual classroom.

OEI was a very lightly tested system - when it worked flawlessly, it was beautiful. Unfortunately, OEI had bugs - some minor, some major. I soon became THE beta tester (and probably the biggest user of OEI besides Eric). To give some examples, one oversight was the inability to disable the "call waiting" feature present in my home phone. Complete uploads and downloads were being lost. A more serious bug arose after several weeks of usage, when some students began to message me and comment that several of my items uploaded to conferences and in my messages did not make sense and there appeared to be missing words and phrases. I compared the source text to the text that had been uploaded by OEI to the conferences and, lo and behold, words and sentences were being dropped. In all situations, the designer (Eric) and I were in constant communication, and whenever I uncovered a bug Eric was there to correct it. (The significant problem with the dropped text was due to

some transmission delays in using Autonet, as I was apparently the first user to go through Autonet rather than directly dialing into EIES. In a relatively short amount of time, Eric was able to correct the situation by using the Kermit protocols.) By the end of the semester, OEI had gone through about 5 upgraded versions, and it was working relatively smoothly.

Another revelation that resulted from my experience in working in the virtual classroom from home was the need for a dedicated phone line. For many years, my family (consisting of spouse and two teenage daughters) had more than adequate telephone service with our single phone and call waiting feature. However, when I began to use (or "monopolize") the telephone for EIES2 access, and thus disabled the call waiting feature, this became a source of friction in the family. After a week or two, we decided that I would need a dedicated telephone line and we ordered one from our local telephone company (alas, there was a two week waiting list for installation, so my wife and daughters had to endure more of this!)

With great reluctance, I also had to use my office computing environment at NJIT to interact with the virtual classroom. From my office, I would use the EIES2 "Preview" feature to preview my waiting items, and if there was something crucial which had to be answered immediately I would do so, else I would download the items from home where OEI would store them on my hard disk for perusal, reply and/or subsequent retrieval. On some occasions, particularly for hard copy, I would use the computing facilities in the Co-Lab.

SOFTWARE NEEDS FOR TEACHING IN A VIRTUAL CLASSROOM

In planning for teaching the on-line version of CIS461, I envisioned the need for some specialized software tools for conducting the class. Clearly there would be significant organizational needs for the information that I was sending and receiving, the grades that would be assigned, and pertinent information related to each individual student in my on-line class. In the Fall, 1994 semester, in assessing these informational organizational and retrieval needs, it became apparent that the functional requirements I envisioned could be satisfied by a PIM (Personal Information Manager). I did a comprehensive review of available Personal Information Managers, ranging from well-known products such as Lotus Organizer, to various shareware offerings, to see if any would satisfy my requirements. After the evaluation, the clear winner was Felipe Kahn's Borland Sidekick for Windows, which I obtained (at no cost to the Sloan grant) and used in the on-line CIS461 course in the Spring. (Subsequent to obtaining Sidekick, there have been two revised versions,

Sidekick 2.0 and Sidekick '95, and the product is now in the possession of Starfish Software, a software company founded by CEO Felipe Kahn.)

I have in preparation a paper entitled "Software Tools for the Online Teacher" but here I will quickly summarize some of the software needs and Sidekick's supportive features.

- o Database needs are obvious, and the on-line teacher requires "one click" access to an 'always open' database of students, so when the on-line teacher is responding to a message from a student or wishes to enter a grade for an "electronically" submitted assignment, the course record for the student is "instantaneously" available. A PIM will obviously not have the power and capabilities of a full-fledged relational database (such as Access, Paradox, R-Base, Approach, or Superbase) but, then again, the on-line teacher does not require such power, and a flat file database structure will usually suffice. Sidekick, which has its roots in the company which pioneered microcomputer database management systems (dBase and Paradox and Reflex), has an outstanding data base component with ease-of-use and powerful features for structuring, organizing and retrieving from a database (other PIMs either do not have database features, or present them in a "contact-manager" like fixed format where you have no ability to customize the attributes to your particular application).

- o The on-line teacher requires "one click" access to a component which provides a reminder system and calendar system. The on-line teacher does not deal with ONE class of students, but rather with N individual students with whom you are in personal contact. Given the enhanced interaction with individual students, I often found it necessary to issue reminders to myself of things that were promised to students, requests to re-evaluate or mail material to students, honoring a student request for an extension on an assignment, coordinating assignments with the schedule of tapes being broadcast over cable TV, etc.

- o There is an obvious need to be able to create, store and readily retrieve information that is sent to students. For instance, in evaluating and returning assignments to individual students submitted on-line, there are some obvious general corrections and comments which you would like to send to subsets of students, as well as some comments that are specific to a particular student. I prefer to answer each student individually, and there was a definite need to be able to quickly retrieve a text item which I had previously prepared and integrate it easily into the item being prepared for the individual student. Sidekick supports this by allowing you to create items and store them into folder-like areas with customized labels which allow you to easily retrieve and integrate into documents. Sidekick also provides a mail-merge type capability so that each student would think he/she is receiving a completely customized evaluation of their assignment.

Several of the features I have described could be satisfied without having

to use a PIM. EIES2, for example, has a gradebook and sophisticated text retrieval and organizing capabilities, but these were unavailable to me with the OEI interface being used. Windows 3.X has accessories for an index file (CARDFILE) and calendars/appointments (CALENDAR), but these are far less sophisticated and not nearly as well integrated as the components in Sidekick. OEI itself did have an exceptionally nice filing system for "accepted" messages and conference comments, but the structure was obviously rigid and could not be customized or tailored by the user to fit his/her needs.

OVERALL IMPRESSIONS

The bottom line is that I genuinely enjoyed the entire year's experience in preparing for, and teaching, the Systems Simulation course in a video+vc mode. Yes, there were obstacles to overcome and challenges to be met, and clearly the work involved by the instructor was substantially more than in a traditional face-to-face section, but the satisfaction achieved justified all of this. I look forward to Spring, 1996, when I hope to again offer an on-line section of CIS461 (and hopefully will have the office computing resources commensurate for the task).

Before beginning the on-line section, I had some trepidations about students disappearing from my virtual classroom and not adjusting to this new pedagogical style, but for the most part this never occurred, and my students regularly logged onto the system. I found myself developing far more personal contacts with the on-line students, and students were asking more questions (in both messages and conference comments) and often more insightful questions than in the face-to-face sessions, since they had significantly more time to review the material. The inability to effectively work in my office with the obsolete machine was a continually annoying issue I had to deal with.

Doing the videos in the Candid Classroom was also an enjoyable activity. Reviewing some of the earlier videos, there were places where I would present some material on the blackboard and this was apparently illegible in the videos, so I would hope that I could go back and re-do some of the earlier videos.

SOME RECOMMENDATIONS

1. Prior to committing to do a video+vc course, the Department and Distance Learning Office must insure that the faculty member has the necessary computing resources both in his/her office as well as home for the course to be a success. The home computing environment is the responsibility of the Faculty member, but the Faculty member's office computing environment is the responsibility of the Department (this is also the position of our AAUP Professional Staff Association). Without the appropriate computing environment, the Department

should not be allowed to offer the video+vc course, and the faculty member should not be allowed to teach in this mode. (While having the necessary computing environment seems intuitively obvious to those who recognize the need for the direct and intense near-daily on-line interaction, this point must be emphasized since in my case it was ignored by the Department.)

2. It would be highly desirable if, on the first day of classes, the virtual teacher opened the "classroom" and ALL students were entered and familiar with the protocols for communicating in the on-line environment. Some of the initial "first week" start up activities of tracking down students, etc., needs to be smoothed out, and perhaps "off-loaded" more to an office that would be dedicated and have the expertise to accomplish this.

3. The EIES2 interface needs to be modernized, somewhat in the spirit of OEI. (I'm told that this is soon to be released with the Internet access?) There should be easy-to-use capabilities to integrate non-text features on-line.

4. PIM-like capabilities need to be integrated for the on-line teacher, either through a separate facility (such as Sidekick) or internally from within the EIES system.

5. I found myself devoting significantly more time to the video+vc version of the course than with the traditional pedagogical mode. Much of this is obviously attributable to the "start-up" activities associated with presenting such a course for the first time in this mode. But there are more demands, on the time of the instructor, to be considered. With the traditional course, you could focus your efforts into the one or two days when the course meets, but with the on-line version you are dealing with the course every day (including weekends!). Perhaps the institution is thereby enhancing productivity, but I would suggest that some definitive objective studies be done to determine how much more time a faculty member devotes to on-line teaching as opposed to traditional teaching, and perhaps some adjustment would need to be made in equivalencing this to the traditional 3-meeting-hour-a-week course, most particularly for the first time the course is presented in virtual classroom mode.

Respectfully submitted,

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September, 1995

Information

Michael Bieber
Course Report for CIS365, Spring 1994 -Fall 1995 (on-going)
Copyright, Fall 1995

CIS365 is entitled "Computer Applications to Commercial Problems." I was asked to modify the course content and we will be renaming it to reflect the new content, which is to cover concepts concerning computer file organization and file access. In effect, the course has changed from teaching the COBOL language to teaching about data files using COBOL as the computer language of the homework assignments. At the time we changed the course contents (the same semester the course was taped) the CIS department had no course teaching COBOL. We will be inaugurating that course at the "100" level during Spring 1996. For the meanwhile, CIS365 has two parts. The first eight one-hour lectures constitute Part 1, which teaches enough COBOL for students to master the materials in Part 2. Part 2 covers the main material of file organizations and file access. Because we plan to cover only Part 2 starting Spring 1997, we had a very hectic taping schedule. We included twenty-six hours of taping for Part 2, in addition to the eight hours for Part 1. There were many ramifications of this, mostly problematic, which I discuss later.

HISTORY

Spring 1994 - Taped

Fall 1994 - VC

Spring 1995 - FTF & Video-Only; also taped guest lecture 2-27

Fall 1995 - FTF and VC

I decided to put up my VC conference structure for the Spring 1995 video-only class, posting the lecture notes and discussion questions described below. Although I monitored the discussion and replied to some student comments, I treated it mostly as if it were a private study group for the students, not an open classroom discussion as with my VC classes.

SCHEDULE

Part 1 (4 weeks)

Week 1: Lectures 1 & 2 - Tape 1

Week 2: Lectures 3-5 - Tape 2,3

Week 3: Lectures 6-8 - Tape 3,4

Week 4: Break to complete first major COBOL project

Lecture 1: Introduction to COBOL

Lecture 2: Procedure Division

Lectures 3-8: Analysis and Design of a COBOL Program, Parts 1-6

Part 2 (condensed for 2 months)

Week 5 - Lecture 1,2 - Tape 5

Week 6 - Lecture 6,7,8 - Tape 7,8

Week 7 - Lecture 9,10 - Tape 9

Week 8 - Lecture 11 - Tape 10

Week 9 - Lecture 12,13 - Tape 10,11

Week 10- Lecture 17,19,20 - Tape 13,14

Week 11- Lecture 21,22,23 - Tape 15, 16

Week 12- Lecture 25,27 - Tape 17,18

Week 13- Lecture 26 - Tape 17

Lecture 2-1: Introduction to Data Structures

Lecture 2-2: Arrays, Continued

Lecture 2-6: Logical File Organizations

Lecture 2-7: Fundamental File Operations

Lecture 2-8: Fundamental File Operations, Continued

Lecture 2-9: In Situ Update & File Systems

Lecture 2-10: File Systems, Continued

Lecture 2-11: Variable Length Records

Lecture 2-12: Sequential File Creation

Lecture 2-13: Sequential File Update in COBOL

Lecture 2-17: Indexes

Lecture 2-19: VSAM

Lecture 2-20: VSAM in COBOL

Lecture 2-21: Hashing

Lecture 2-22: Hashing, continued

Lecture 2-23: Collision Handling

Lecture 2-25: Guest Lecture: Designing for Performance, David Mackler,
QVC

Lecture 2-26: Review Session

Lecture 2-27: Guest Lecture: Igor Krugliak, MicroFocus COBOL, Inc.

VC CONFERENCE GUIDE

I currently utilize six VC conferences to keep the class materials organized. Contents of the first five conferences for Fall 1994 are on the attached disk.

- #1: Administrative Information
- #2: Homework Assignments
- #3: Class Discussion/Questions
- #4: Teacher Notes on the Taped Lectures
- #5: Short Self-Introductions of all Class Members
- #6: Uploaded Programs from the Text Book

CLASS STRUCTURE

I ran the VC version of 365 as follows. The first homework assignment asked students to place a short biography in the Self-Introduction Conference. To force participation and class discussion, I have a weekly homework assignment with three parts. First, students must email me three questions based on the previous week's materials. This forces them to think about the class materials on a regular basis. Next they must post their best 1 or 2 questions (based on how many students are enrolled) in the Class Discussion conference. Third, they must answer between two and three of the posted questions. This fosters class discussion. To show that I am serious about this, I grade this participation (based on the quantity of questions) weekly and post this grade weekly. An added benefit is that this becomes a nice pool of exam questions. I also add my own questions to this conference a few days after they post their own. I'll often craft mine based on those of the text book. (The Uckan text poses excellent short discussion questions.)

I post a commentary on each taped lecture in the Teacher Notes conference, and date each lecture to match the schedule posted in the Administrative conference.

I keep the grade book activity in the Homework Assignments conference. This semester I've started placing graded programming assignments in the Collaboration Lab so distance students who are on campus can come to pick them up. If a student does not regularly come to campus, I'll email him or her about the assignment grade (i.e., what I take points off for) to explain the posted grade. No one has asked me to mail back assignments, but I suppose I should offer to do so if the student supplies a self-addressed envelope.

PROBLEMS

I've had two major problems with this course. The first is chronic low enrollments. In my first VC section in Fall 1995, I ended up with eight or nine students. My Spring 1995 video-only class had three students enrolled. This semester's VC class (Fall 1995) has six students. With the two VC classes, only about half the students participate in the discussion. (The rate was lower before I started providing weekly grades for the weekly questions.) I find this incredibly frustrating, and attribute this to the poor performance of many students. VC classes need a critical mass to foster excitement, commitment and discussion, and I've never had this critical mass.

My second problem was teaching COBOL in the first part of the class. For the class being taped, we used the COBOL on the TESLA computer system on campus which had no documentation. It was a disaster. For the first VC class we used the COBOL that came with the textbook, with about the worst documentation I've ever experienced. I didn't realize how bad it was until after about two weeks---half the first module. I then realized in retrospect that we needed to have a FTF orientation session for the computer language in addition to the FTF orientation session. This semester I found another COBOL (MicroFocus COBOL) which has good documentation and a good tutorial. This worked out much better. In fact we didn't really need an orientation, though in retrospect, one of the tutorial chapters needed some more guidance. Here's another mistake in retrospect. To save the students some money, I thought we could skip getting a separate textbook just for Part 1 of the course. I thought that the tutorial and the 500 page manual would be adequate. I was wrong. Much of the class needed a textbook for doing the assignments, mostly for little things here and there. I covered the major things in class or they were covered in the tutorial. None of this would be a VC problem as such, except, that given the lack of critical mass, problems on-line seem to take longer to congeal than FTF because it takes me longer to figure out both that there is a problem and what exactly it is. This delayed response time caused other problems to linger, as I describe later.

I've encountered other problems as well. The semester I taped the class was my first teaching the course (and indeed the first time the course was offered in its revamped format). If I were to tape it now, I would do the lectures much differently. One should never tape in the first semester! Also, the very quick pace to squeeze the extra month's materials in on tape (i.e., 26 hours of Part 2) took a great toll on the FTF class being taped. We had very little time for anything except the taped lecture, resulting in very little discussion time in class. Also, had this not been my first time teaching

the course, I believe that I could have structured the non-taping time more constructively. Of the nine students enrolled I failed 4 and gave low grades to one or two of the remaining students.

During the video-only semester, the EIES system hit a glitch on *only* my account, meaning that for about 5 weeks, we had no conferencing system available. Furthermore, due to the low enrollments, it wasn't clear to me until about the third week that there was a problem at all. I thought the students just were not responding. In fact, no one got my messages. I only got theirs. Then, the EIES staff did not believe that the problem existed. They thought I was just mixed up. Finally when I convinced them that there was a problem, it took a week to fix. The three students in this class got a very late start.

This current semester, the company handling the tapes decided to spread them out, and only sent out lectures 1-6, assuming these would suffice. The COBOL assignments assumed students had lectures 7 and 8 as well. We had about two weeks where the students did not have enough information to complete the homeworks for part 1. This exacerbated the COBOL learning problems described earlier. And again, being on-line, it took me about two weeks to figure out that some of the tapes were missing. It amazes me that no one posts critical information like this until weeks after the problem occurs!

This semester, for some reason, two or three students decided not to follow my abridged schedule (which I posted twice, in addition to dating the lecture notes clearly in the subject line). They viewed all the tapes, including the lectures I skipped and provided no notes for, and fell behind.

GROUP ASSIGNMENT

I've only tried one collaborative programming project. This semester I split them up into groups of three and gave design criteria as part of the homework assignment. What a disaster. Although I only assigned students who were answering the questions, several dropped out during or just prior to the assignment, leaving two of my three groups with a single active member. Some group members did most of their work in person and thus didn't communicate solely on-line, so I couldn't monitor their discussions and progress, and therefore couldn't give the guidance I had planned. It was a disaster. My FTF class, which had the same assignment, did much better.

Also, in my FTF class, I do many short group exercises that last 3-10 minutes. I need to figure out a good way to do these on-line.

CONCLUSION

Despite these problems, I strongly believe the VC methodology has much to offer (as long as you have a critical mass of students). Shy students can participate freely. Students have time to think over answers to questions, and can answer in detail. This results in a deeper discussion, and one that everyone can keep up with. Face-to-face discussions benefit from immediacy and quick follow-up questions, which the VC environment unfortunately cannot provide.

My lack of success with CIS365, given VC's many benefits, frustrates me. I normally come away from my FTF classes feeling that we've had a great discussion and that the materials are clear. I come away from monitoring my VC class depressed that so little is happening. I believe this is because of the critical mass. A third of my FTF actively participates in discussions and makes the class lively. A third of twenty-five is eight. Half of my FTF class still is silent (except for reciting their best weekly question when I call upon them), and do poorly in the assignments. For some of the shy members of this silent group, I believe VC would be a better teaching medium.

I'm looking forward to taping the COBOL course next fall, after having taught it FTF the semester beforehand.

Teaching
Computer Systems Management
(CIS 455)
in the
Virtual Classroom Environment

by

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Report written for the Sloan Foundation Virtual Classroom project at
NJIT

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INTRODUCTION

This is a report on experiences in teaching CIS 455, a senior level elective course, on the topic of the Management of Computer Systems, utilizing the Virtual Classroom technology during the 1994-1995 Academic year and the Fall of the 1995-1996 Academic year.. The first semester involved the use of Virtual Classroom with a face to face class. The students in the face-to-face class utilized the Virtual Classroom for the carrying out of many of their assignments and for class discussions.

The second semester involved the use of both a face to face class and remote students who are presented the lectures via video tapes. The video tapes were produced during this semester. In this offering the remote students and the face-to-face students are treated equally with respect to the online class discussion and the assignments. The only difference was that the remote students had an extra week to complete assignments because of delay in the delivery of video tapes.

The third semester involved only remote students taking CIS 455. Since this involved only about seven students the instructor chose to merge the remote CIS 679 (Management of Information Systems) students into the same conference. This remote class was only about five students. The graduate course is in the same topic area and although there are different books, lectures, and readings, there is sufficient overlap of discussion topics that this was considered a good way to establish a critical mass of students to maintain an active discussion flow.

The course CIS 455 has a very detailed syllabus that explains the major requirements and readings for the course. That document is attached as an appendix to this report for the benefit of the reader. It does offer the reader insight into the illustrations in the class discussion and the utility of the Virtual Classroom for coordinating activities of the students on an individual and group basis.

OBSERVATIONS

This course has the objective of providing students in Computer Science and students in Information Systems with a basic understanding of the management problems that are peculiar to the development and operation of computer hardware and software systems. About half the course is spent upon the typical systems development process and the problems that can occur at each stage of the process and how they can be dealt with.

The course relies on five Harvard Case Studies to provide the student with realistic situations to which they must apply the various considerations they have been learning in the course. They are also encouraged to go into the professional literature and read some of the recent work in this particular area of management. For many students this is one of the few courses in which they are exposed to professional articles in the field. In addition, as a final project they are required to pick some changing area of the technology and determine what sort of implications this technology change will have for management in this field. This also requires their use of the professional literature.

The course requires a great deal of reading material and the comprehension of complex ideas and concepts and their application to the types of pragmatic problems that managers face in dealing with Information Systems. It is a different form of thinking than is usually required of the students in the technically oriented Computer Science courses.

There is a great deal of what is termed "pragmatics" in a course of this sort and one of the key advantages of the use of the Virtual Classroom approach is the ability to generate far more class discussion than is possible in the rather limited amount of time offered in the face-to-face classroom environment. In order to know if students have truly grasped a concept and can apply it to a given situation the instructor has to be able to see their reasoning process in addressing a particular question or issue.

The content of the course builds upon itself so that it is important that the material be developed in proper order. This also applies to the benefit derived from the class discussions and it means that the instructor strongly desires to keep the students in synchronization with respect to what is done each week. The student who falls behind is at a great disadvantage.

This is also a problem in running a combination of face to face and remote students as a single class. There is the resulting need to get both groups in synchronization as one class. Because of this it is highly critical that the remote students receive their materials in time to get started at the same time as the face to face class. This has not been possible for a variety of reasons, and often it does take the remote students three to four weeks to catch up with the progress of the face to face students. Ideally the remote students should have access to the conference system at least two weeks prior to the start of the semester if this is their first time use of such a communication facility. However, many students delay their registration to the last minute.

For those who are normally face-to-face students, the decision to sign up for a remote course may come only after they realize there is a conflict in their planned courses, a course has been canceled, or when a course has been over subscribed so they can no longer get into the face-to-face offering. In the last semester of this report there was an unusually high number of remote registrations that the distance learning staff was unprepared for. The resulting part time employees made many mistakes in the mailing of materials and in some cases the students were a month into the course before they obtained all the material.

Those students that are dropping out usually do not bother to inform the instructor and one may not find out that a student has dropped until the end of the semester. Usually I will attempt to contact the student by phone during the first two weeks if he or she has not been online. After that I will send electronic mail if they appear to be dropping behind in the conference or the assignments.

Student Activity

The online activity during the semester for CIS 455 can be summarized in the following table. This is for the first two course offerings mentioned above; the final offering is still underway.

	Total Number of Comments	Comments made by instructor	Number of Students	Max - Min Comments/ student
Fall 1994	294	91 / 31%	15-21	30 - 10
Spring 1995	329	102 / 31%	18-28	22 - 9

The observation that the instructor made about 30% of the comments in the class discussion conference is fairly typical of this instructor's prior experience with the use of Computer Mediated Communications for this purpose. The above did not include the private messages nor the assignment conference. This was a separate conference for both offerings where the larger text assignments (professional article reviews and executive summaries of final project reports) were entered separately. Entries in that conference by students are typically a hundred to two hundred lines long.

While there are significant contributions in the class conference by every student, there is still a 3 to 1 magnitude ratio in the spread of contributions among the students. This is not unusual. In these class discussions there were at least five entries that had to be made by every

student. These were in the form of Activity Questions that had to be answered.

For the number of students the higher number is the number of students that started the course and the lower number is the number of students that finished. The actual grade distributions are in the following table:

Grade	Fall 1994	Spring 1995
A_	2	5
B+	3	2
B_	5	6
C+	1	2
C_	1	0
D_	0	0
F_	2	1
I_	1	2
W_	6	10
Total	21	28

In the above an "I" stands for Incomplete and a "W" stands for withdraw. I have found that 20-30% withdrawal is typical of the courses I teach. Since they are electives if the student gets overloaded withdrawal is likely choice. Even with warning students that they are not keeping up some do actually go on an flunk even though the withdrawal can be done like up to two thirds of the way through the semester. In the Spring seven withdrawals were for the remote students and there where for the face-to-face students. I believe the high rate was due to the administrative and access problems that the student faced in getting in synchronization with the rest of the class.

Information Overload and Reactions

Sometimes one has to deal with the results of poor or miscommunications among the students. Some students, overcome with the amount of material that can be generated in conferences, become very negative and express displeasure to or towards other students.

C 103.12 CC 36.1.2.2 XXXXXXXXXXXXXXXX 10/26/95 3:22 PM 25 lines
Subject: WASTING TIME

YYYYY and ZZZZZZ wrote:

YYYY:

> finally got mine. they found in the stockroom of the bookstore! if your

- > having a real hassle (I know, because I just lived it) let me know and I
- > could fax you a copy

ZZZZ:

- > Thanks YYY ,but it looks like I found a classmate, who
- > is willing to help me out by letting me copy the case studies, if it
- > doesn't work out, I may have to take you up on your offer. ZZZZ

XXXXX:

Do you think you guys could *Please* do this through the private Mail option in EIES. Type ++ then pick mail and send it that way.....

It's bad enough that we have to belong to two conferences for one class which involves probably more than 50 students. Every time I log on I have to sift through all these comments to decide which is important to the class and which is not.....

If you think its gonna help your participation grade by just having more comments posted, I would guess that won't work. The CIS 350 class taught us that participation has to be based on more than mere keystrokes.....

See Murray I did learn something after all.....

Laugh XXXXXX

The prior example was fairly mild and easily dealt with, but here is a more severe example that went a long way to inhibiting one student's participation in the class conference. Even with the discussion below he was very shy of making further comments in the conference and continued to place more emphasis on communicating with me via messages the rest of the semester.

C 103.12 CC 6.3.2.3 (ANONYMOUS) 10/3/95 1:56 PM 14 lines

Subject: petty

Did XXXX say "petty" ???

Oh yeah you mean like your incessant comment to the comment to the comment, after a reply to replied to comments with a follow up to the comment reply that you already replied to 3 times.

Now that's "petty".

Sorry had to do it, look XXXXX the participation is Great, but lets not overdo it please??? I mean really we have enough to read as it is without having to filter through all the really unneeded comments from everyone.

The student who was being singled out here sent the instructor a private message giving his reaction to this comment. And the following dialogue ensued.

M 15962 XXXXXXXXXXXXXXXXXXXX 10/5/95 7:55 PM 19 lines
TO: Murray Subject: Too many comments

Sir,
I received what has to be the rudest and most embarrassing note I have ever gotten (n60087). I feel that the person could have sent me an e-mail personally and not posted it where everyone could read it. Anyway if that is the consensus opinion I apologize to you and the rest of the class.

I am new to this and maybe I don't understand the etiquette as I should. I will be cutting back my comments so as to not embarrass myself for upset the others. I thought the idea was to get a dialogue going so that is why I replied as I did. Again if I was mistaken I apologize. It didn't seem like I was doing more than others, but again I must have been wrong. IN over 16 years of school I have never been insulted like that. It was also disappointing that the person did it anonymously so I don't have the chance to apologize to them and maybe they could find out someone is new and learning. Anyway, I have enjoyed your lectures so far and the class. If you don't see me commenting and participating anymore I thought you should know why. Take care and thanks for your help so far.

M 15962.1 Murray Turoff (Murray, 103) 10/5/95 9:06 PM 6 lines
TO: XXXX Subject: really sorry - ignore that one

I found nothing wrong with your comments and I am the one that counts. Sorry if the anonymous comment passed by me. I have used this medium so long that I may not notice that sort of comment as it is quite common in a lot of discussions when a student goes into information overload because they have not kept up.

Please don't be discouraged from commenting further.

M 15962.2 XXXXXXXXXXXXXXXXXXXX 10/7/95 10:37 AM 9 lines
TO: Murray Subject: Thank You

Sir,
Thank you! The main point I wanted to make is that if I was out of line I will most assuredly own up to it. What I'll try to do is try to be diligent not to say something unless I think it will be of real benefit. I do have 10 years of work experience and since many of the class members are seniors with only some experience I might have an idea or two that some may find useful. Thank you again, your really picked up my day!

M 15962.3 Murray Turoff (Murray, 103) 10/7/95 6:29 PM 1 line
TO: XXXXX Subject: Thank You

There was nothing out of line in what you did say.

Students Getting Behind

There are students who seem to disappear from the class and do not keep up with the discussion. One has to begin sending private messages to these students and try to determine what has happened to them.

M 16468 Murray Turoff (Murray, 103) 2/10/95 10:25 PM 5 lines
TO: XXXXX, YYYYYY Subject: need to catch up in c103.12

Those of you receiving this message seem to be quite far behind in reading the comments in the class conference 103.12 or in doing the activities there. Please try to catch up and if you are having problems or have dropped the course you should let me know in a message.

Here are some examples of the results of such an inquiry.

M 16619 XXXXXXXXXXXX 2/18/95 10:46 AM 7 lines
TO: Murray Subject: Lateness

Prof. Murray
Sorry for falling behind. I've just recently got my hands on the case studies. I'll get the first one to you next week. I'd get it to you sooner, but I have two midterms to take by the 23rd. I'll pick the topic for my paper by then as well.
Sincerely

M 15544.1 XXXXXXXXXXXX 18 lines 10/3/95 10:02 PM
TO: Murray Subject: thanks for the letter

Hi Prof. Turoff, thank you very much for this mail, especially your considerations. I will try my best to catch up. I plan to finish the first case by Oct. 9 so I could be only one week behind. This course is not easy to even if there is not these problems as a remote student. The reading is overwhelming for me as a non-native English speaker and I have minimal prior knowledge and experience. On the other hand the potential gains from doing this course can be enormous.

Many remote students seem to be taking on more than they should and the better ones are able to catch up in what seem to be dramatic spurts of effort.

There have been cases of students not receiving the necessary materials or receiving the wrong materials. One case was so bad in terms of a sequence of mistakes that I had to ask the student to document it in a letter so it might have an impact on improving the administrative handling of materials.

M 15544 Murray Turoff (Murray, 103) 2/27/95 2:08 PM 7 lines

TO: ZZZZZZZZZZ Subject: thanks for the letter

Thank you for the letter. I will see that your letter reaches the people in the administration that are suppose to insure that what happened to you semester does not happen to others in the future.

I hope your letter will help to eliminate these problems. I know that does not help you this semester but as your instructor I will try to give you any leeway you need in meeting and doing assignments including putting off your final project to January if you like.

There is no doubt that this medium of communications encourages many students to be extremely frank and open about their lives and the impact this has on their performance in the course. In the years of using this medium I have had many extremely detailed explanations of problems they have in their personal life. The one below is an excellent example of the degree this can take. Included are the subsequent replies.

M 17279 XXXXXXXXXXXXXXXXXXXXXXXX 11/2/95 7:51 AM 25 lines

TO: Murray Subject: the paradox we have

Hi, Dr. Turoff. Long time, no hear. I'm writing to you to fill you in on what's been going on with me, why I have all those items marked unread, why you have no project from me, etc.

I have always been a good learner, but a poor student. By this I mean that I have an active interest in learning for the sake of learning, and often work harder in my classes than many "good students." On the other hand, I also often let myself fall behind schedule when a different interesting problem pops up. I tend to focus on one topic or project for days at a time; it's how I work. Anyway, it's not necessarily too good for trying to be a student. It doesn't leave one any slack when other things in one's life go awry. I've always been able to get by on my ability to cram and learn things quickly, but this semester, it backfired nicely for me.

I came across an interesting new situation, began to study it, and decided to change the subject of my senior project in order to study it some more. I let it consume my time. And then I had some problems happen in my life, and since I had already let myself fall behind in all my other classes, well, I had no slack to catch me.

Without trying to sound like I'm making excuses, I have been dealing with the mystery disease (my doctor likes me, because I'm an "interesting case." After several expensive diagnostic tests proved non-diagnostic, he is convinced that he has no idea what I have.) My disease is not disabling anymore, but it is recurring and annoying. Next, I had an accident while driving a truck for my friend who was moving. This led to legal hassles and the necessity to drive down to central Jersey several times, as well as having to deal with a variety of insurance companies (mine, his, theirs, the truck rental's, ugh) repeatedly on the phone. Then my aunt was diagnosed with breast cancer and the doctors planned on a radical mastectomy, which pissed me off, because it's already become well-

known that a radical mastectomy connotes no benefit relative to a more limited lumpectomy. Or rather, it's become well known over here, but not in Poland where my aunt is. I failed to reach the right people in time. C'est la vie.

THEN my best friend was involved in an accident. He lives in an apartment in Newark, and the only remaining family he had in the area had moved to North Carolina, where the rest of his family is. My friend had a head-on with a drunk driver while he was on a motorcycle. Considering that this happened on McCarter Highway, it's a miracle that he's alive at all. He was out for a few days, but the net damage was only a concussion and a broken foot. And soreness everywhere. (He's doing fine now, in case you're curious. He's well enough to get around, has a walking cast, and left yesterday to go visit family in the Carolinas.) At any rate, at the time, he didn't have anyone to take care of him, so I, another friend, and my sister took up the job. We took care of paperwork for him (the hospital didn't know he had insurance; suddenly, they weren't going to release him quite so early. . .), brought him things from his home, got accident reports so we could all know what happened (he still doesn't remember the accident), recovered his motorcycle from the tow yard (the bill grows daily until you do this, kind of like a savings bond), and etc. After a week and a half or so, he was settled back in his apartment, we were past any danger of serious brain injury (and he was eating again), and all the other matters had been passed into the capable hands of his new attorney from A.I.M. (Aid for Injured Motorcyclists.)

Then, I had to prepare for an obligation I had given myself many months ago. Remember the friend for whom I was driving the truck? He was getting married, and I had promised to play the piano for his wedding. I had already done this once before (ceremony, cocktail hour. . .) for another friend, and it went great, and so when they asked, I said sure. Then I realized that I had a long list of pieces to learn to play, and it was only a week before the wedding. So I set myself to doing nothing but practicing for a week or so. (I had forgotten how much one's back and neck can hurt when putting in those kind of hours at the keyboard.) Anyway, I managed to pull off the wedding day to everyone's satisfaction but mine (after all, I KNEW where I had made mistakes or skipped difficult problems. The others were blissfully ignorant, except those I told.)

So, in the end, things turned out OK for everyone but me. Oh, did I mention that during this whole time, I was still working weekends? I work as a dealer/floorperson in Atlantic City, and, except for the wedding days (my friend's and my cousin's), I had to drive on down to AC to work. I have no sick days left because of my disease (which began late this summer), and they don't want to give me a leave of absence. They are trying to hire new people, but it's hard to get extra days off, especially when requests are granted based on attendance. Anyway, after all that had gone on, I was mentally exhausted, and I dropped out for a week. I continued skipping all the classes I had missed for several weeks and sat around, or drove places and did nothing. A couple of times I took Derek (of the motorcycle accident) up to Garret Mountain reservation and just sat there. It felt very, very, good not to be doing anything, and not to be thinking about what I needed to do. I guess I was pretty burned out.

Then, somewhat at the prodding of Derek (what are friends for?) I started trying to pull my semester back together. I made arrangement with all my other prof.'s so far, and will be making up work, making up mid-terms I missed, and so on. I wasn't able to find you

on campus, and haven't started making up work for this class until today (I started reading the conference again). Well, that's not quite true; last week I spent a few hours in the library reading articles. Oh, did I mention that I'm making up much of my work as a sort of independent study? A week ago Thursday, my car was stolen; it was parked by the Gymnasium. Remarkably, it didn't phase me. The police and my friends were all very surprised at how I handled it; it really seemed like no big deal to me, relative to all that had gone on this semester. Anyway, driving in will be difficult to arrange on many days, and the public transportation near my house is not good. So my other classes will be running kind of like this one was supposed to be!

The other thing that has surprised me is that my professors have been very understanding. I don't mean that I didn't expect that, but most of them didn't even want to know anything about what had happened. The fact that I went to them, apologized, and asked for the chance to make things up was enough. It's true, some of them know me from other classes, but it was still enough to make me want to cry. One prof only wanted a copy of the theft report, so he has an official record of why I missed the mid-term.

Which brings me to the reason for writing this very long letter. I don't know if you wanted to know all the details, but no one else did. I guess I've taken this as my excuse to unload all my troubles. In fact, I feel better just having written all of this.

I'm not yet sure if I'll send you this, but if I do, thanks for taking the time to read it.

I'm sure I can find what I need to do on the conference; I'll be working as quickly as I can to catch up, and I hope to take the final with everyone else when you offer it on campus. I'll keep you posted on my progress in making up all the other work, unless you send me mail indicating that it's too late to try and make up the work. Please let me know soon; I'll be checking in again Friday afternoon; right now I have to prepare for two finals tomorrow.

M 17279.1 Murray Turoff (Murray, 103) 11/2/95 1:26 PM 15 lines
TO: xxxxxx Subject: the paradox I have

I am not sure how I can respond to this. Normally given your circumstances which I actually believe(!!!) I would suggest you take an incomplete and I would not mind you making up next semester. However I go on sabbatical in January and am off to Australia and New Zealand.

You would have to get special permission to go beyond the six month deadline on incompletes and wait till I get back to finish the course.

So this leaves no flexibility. You have got to complete the work according to the deadlines I have set, the exam in a few weeks, the project by dec 21st, etc. or drop the course and pay tuition for retaking it or another course later. I wish I had more flexibility to help you but it is not possible in this situation.

M 17279.1.1 XXXXXXXXXXXXXXXX 11/2/95 7:51 PM 25 lines
TO: Murray Subject: the paradox we have

Normally, I wouldn't mind taking the incompletes from most of my courses, allowing me to finish the others without great strain.

But (and I verified this with Michael Tress today) I'm slated to graduate this December/January, and it doesn't look like I'll be able to afford to take an extra semester to make things up.

So I'll just do my best trying to meet the deadlines that are already established. Given both our situations, I think this is the most I could ask, and the most you could offer.

I'll be doing my best to make up what I'm missing in the conference this weekend (which, I just learned by calling scheduling at the casino, I have off!), and tomorrow afternoon I'm staying as late as I can to study in the library, since my access to campus is limited.

I'll also be checking in with the police again; I suspect my car will be a loss, and I can't afford another; I'd rather not spend my winter on a motorcycle AGAIN (I did that last time I had a car stolen in Newark; a friend gave me his motorcycle), but I may resort to buying a cheap motorcycle if I become desperate.

You can be on an insured motorcycle for \$300 or so if you don't care about aesthetics or high speed; that's something you just can't pull off with a car. Also, some relatives were indicating that they're ready to buy new cars, anyway, so perhaps I can get a decent used car for a song; the insurance on my old car is still paid up, so I should be able to credit that to any replacement vehicle.

Anyway, thanks for giving me the opportunity to try. We'll see if I'm capable by the time the exam has gone 'round, now won't we?

CLASS DISCUSSION

The following is a presentation of the flow of the online class discussion for CIS 455. It uses examples of the students' and professor's inputs copied (with only minor editing) from the actual conferences. The names of the particular students have been removed so authorship cannot be identified.

The conference is set up with a limited number of comments already made by the professor before the students are allowed in. These have the nature of welcome and orientation objectives.

C 103.7 CC 1 Murray Turoff (Murray, 103) 1/14/95 11:42 PM 40 lines

KEYS: welcome Subject: welcome to CIS 455

I would like to welcome you all to our class conference. This is our primary place for discussion. If you have any questions on the reading materials or the lectures you should enter them as comments in this conference. My lectures do not duplicate the reading material and if you do not ask questions about the readings I will assume you understand them and can ask about any of them in the course exams.

There will also be a number of assignments that must be done on line and entered in the conference.

I have picked out five Harvard Case Studies that I feel provide important insight into the management of computer systems. The HBR case studies are real situations that have occurred in companies. I am noted for pushing students and my courses are not easy. However, I hope you will end up agreeing that I have some important and useful insights to provide you about this subject.

We can have a lot of fun with this topic and learn a lot if you all participate and keep up. Late assignments will loose two percentage points a day of a grade points.

This conference includes both the students in the face to face class and the students in the remote section and you will all be treated as part of one class.

Since the remote students receive the tapes about one week late certain assignments may be a week late on the part of the remote students if they require the lectures.

The case studies cannot be late as once I lecture on the given case study I cannot give any credit for late case studies as you will know the answers. Therefore case studies must be post marked on the day of the lecture.

Mail you assignments to my home (see syllabus) and DO NOT require any signature for delivery.

The next comment is some hints on using EIES, the conference system. It attempts to head off what I have found to be the common things that the students do wrong or do not understand. A great many students feel it is a rite of passage to not have to read a manual when learning a new system. Unfortunately in a communication system some types of misuse or unintentional errors can make life more difficult for the other participants.

C 103.7 CC 2 Murray Turoff (Murray, 103) 1/15/95 0:01 AM 100 lines
KEYS: help/EIES Subject: Helpful hints on using EIES

Enter the command +who 103 and you will see I am listed in EIES as: Murray Turoff (Murray, 103) Now enter +who (your id number) you will discover that the stupid sign in routine has put a lot of unnecessary garbage in your name and nickname. It is important that you go to the directory and update your material including redoing you name and nickname so they are what they should be. The headings on EIES have fixed field length and this long name and nicknames push useful material outside those total field lengths and make the headings for comments you write incorrect and foul up the name listing for the Gradebook. So it is urgent that you correct this. We have been trying for a year to get Computer services to change this but this is the way they wrote it and once in software it is in concrete. Why IS organizations do things like this is a valid topic for this course. When you go to the directory choose Y for Your entry and you will be

able to change each field. You might want to look at mine to see what a "description" is like.

Please be sure to fill in your directory and do include a phone number where I can reach you if I need to.

EIES has a number of features you need to master. There is a simple line editor for making corrections on line and you can call up a speller if you wish (ask Help) or you can learn to upload and download material (see ?upload and ?download). If you prepare material in another editor it should be converted to ASCII before uploading.

One of the features we will be using is attachments and activities. These may be associated with any comment in the conference. One type of activity is a "QUESTION" and when I use this you should use the "activitY" choice to ANSWER the question. You enter a "Y" to choose activitY. Until you supply an answer to a QUESTION ACTIVITY you can not see the answers that the other students have supplied. This encourages equal participation in the discussion.

The next comment is a QUESTION ACTIVITY I am asking you to ANSWER.

Note any activity will have the "key" put on it of "activity"

When you compose something it starts a new root comment: (numbered with integers). When you Reply to an existing comment it will number that reply using the root number (e.g. 25.3 is the third reply to comment 25). Being careful about using the Compose and the Reply carefully will help us all to keep the discussion organized for later retrieval or review.

The use of good "keys" is another way of keeping our discussion structured. The FIND command will show you a list of keys and how many comments are associated with each one.

When viewing your new material or waiting comments in a conference you can put your own personal keys on them (private to you) and there is a command +todo which will put that key on any item so you can later retrieve it. You can also delete the key later when you have taken care of the item.

There are number of public conference you can join and conference 1000 is a place to practice using conferences. Our class conference is private and I control the membership as the monitor of the conference. If you wish to see all the conferences available when you see your conference list (that you are a member of) do the All command to see all conferences and whether they are public or private.

If you are having any problems using EIES send a message to HELP and some one will reply with an answer fairly soon (usually within a few hours).

Conference 1000 is set aside for practice if you are unsure about how to enter comments or do other things. It is a very good idea to try creating a comment there just for practice before entering anything here.

You should try Find and choose keywords to see what it looks like. You can also put personal keys (like "todo") on any comment that only you can see. As get to 100's of comments you will be very glad that all of us tried to make careful use of keys to identify items you may wish to retrieve later.

EIES DOES NOT DELIVER the items YOU wrote as WAITING comments or messages. They are created as Accepted for YOU and WAITING only for the rest of us. If you want to see that what you wrote is there you have to choose Accepted.

If you put things in the wrong place I will copy the item and sent it back to you as a message so I can delete your entry. If assignments are put in the wrong place I will not grade them. Even for general discussion be sure to choose Reply and give the comment number you are replying to when entering a reply. If someone enters a comment like number 30 then replies will become 30.1 30.2 etc. and this is very useful in reviewing a discussion. You can enter 30.. and get all the replies.

Good Luck

Getting to Know One Another

The next item represents the first use of an ACTIVITY on EIES and it is where students are asked to introduce themselves and some of their background relative to this course. They are also asked to indicate what they hope to obtain from this course. As the instructor I also answer this question and provide some background on my experience relative to this course.

The examples provided below of the students' responses show the tremendous variation possible in the backgrounds of students relative to this course. This highlights the importance of giving students the ability to improve the feedback that they can give the instructor. In an area such as management certain things will be easily grasped by those who have lived through relative management situations. Other students will find it more difficult to comprehend the situation. However, if the instructor can get the more experienced students to restate certain knowledge in the context of specific situations they have encountered this will make the material clearer to the students who have not had the same experiences.

C 103.7 CC 3 Murray Turoff (Murray, 103) 1/15/95 0:15 AM 36 lines
KEYS: introductions/Question/Activity/ Subject: This is where everyone introduces themselves

This is a QUESTION ACTIVITY so you must answer it by going through the procedure of choosing "activitY" first. This will give you a chance to practice with it.

Please introduce yourself to the class and after giving the basic idea of where you are from and what you do, try to also answer the following for my benefit.

What is your major and what sort of technical or management background do you have with computer or information systems? If you have no direct background, do you have any work experience where you have observed the use and or abuse of Information Systems?

What is it you hope to learn and or understand from this course?

Try to keep your answer to about one or two screens.

When you enter Y for activity it gives you a list of all activities and whether or not you have DONE them. you can then enter D for Do and then the comment number of the activity you wish to Do and then R for responding to the Question. Only after you have entered your response will you be allowed to see what others have said. This is a tool we will use for a number of "questions" I will have. Unlike a face to face class, everyone MUST respond to these discussion questions and this illustrates one way in which the on line class maybe a more effective learning device than using discussion in face to face classes! This also illustrates why applications done on the computer are never the same as the manual version even if they "sound" the same (e.g. email and the post office).

The very first response to this question is answer by the instructor where the student is present a summary of the instructors background and some of the instructor's experiences that aid in qualifying the instructor to teach the course. Also the student is provided a short list of some of the publications by the instructor that are relevant to the topic of the course.

The following are typical examples of entries made by the students in response to this first question.

C 103.7 CC 3.3 XXXXXXXXXXXXX 1/19/95 10:16 PM 17 lines Subject: Introduction. Modified on 1/19/95 11:04 PM by XXXXXXXXXXXXX

Hi Professor and fellow students, My name is XXXXXXXXXXXX, but everyone can call me "XXXXX." I'm from Jersey City, NJ. I'm a CIS major. I currently work for Bell Atlantic Yellow Pages as a Technical Services Supervisor. My company consist of 9 offices (6 in PA and 3 in NJ), and I manage 3 of the 9 division's Technical Services department. I have experience in supporting applications and devices in the areas of PC's, UNIX, Dec., and Networking. Aside from providing customer support, a good part of my time is spent evaluating technology that may improve in how company does business. Also, I manage 8 technical administrators, and I also provide internal and external training. In taking this class, I intend to enhance my knowledge and experience in managing system information and people. Also, if possible I hope to benefit from other students as well as everyone benefiting from me. Looking forward to working with everyone.

C 103.7 CC 3.4 XXXXXXXXXXXXXXXXXXXX 1/23/95 5:28 PM 8 lines Subject: Hello everyone!

Hi everyone, My name is XXXXXXXXXXXXX but most people call me XXX. I'm a junior here at NJIT majoring in CIS with a minor in management. I don't have any work experience in the field, so my background comprise of the classroom experience only. I hope that this course will give me some conceptual and practical guidelines for dealing with information technology and for making efficient and effective decision with the management of information systems.

C 103.7 CC 3.6 XXXXXXXXXXXXXXXXXXXX 1/25/95 2:39 PM 18 lines KEYS:/greet Subject: Hello everybody

Hello, My name is XXXXXXXXXXXXX and I am a 2nd semester senior in computer science at NJIT. I am a drop in student after leaving college and working in the computer industry for 4 years. I have run the gauntlet of jobs from operations and programming on an AS400 at a major hospital to a network administrator/technician at another major hospital. I have seen the good and the bad of IS departments from the inside. I have been lucky enough to have good managers over me but have also seen poor management from higher level admin.

I hope to pick up insight on how to integrate and maintain a good working relationship between the IS dept. and the rest of the company. I would like to find ways to alleviate some of the power plays and distrust that exists both for and inside the IS department. IS has much to offer a corporation if cooperation and realistic expectations are set. I would like to learn how to bring this about in my future jobs.

C 103.7 CC 3.8 XXXXXXXXXXXXXXXXXXXX 1/25/95 8:30 PM 20 lines Subject: HI

My name is XXXXXXXXXXXXX and I'm a Rutgers's senior majoring in IS. I should say I'm a part-time student working full-time who has been going to school evenings for a long time. I work with a large law firm in Morristown, NJ. My job involves assisting the MIS Director with managing our Novell network. We have about 300 PC users. It's a lot of work which I find very challenging and frustrating at the same time. I kind of fell into computer when I started in word processing. I'm still involved with word processing at the Firm, but have broaden my base network management.

I'm still learning much. There's a lot of computer information out there and it's not always easy to make decisions about what application or product would best suit your needs, etc. etc. One of our projects for this year at the job is to begin firm wide implementation of windows. Some of the issues we have are training our users, some of whom will not be happy at all about having to use windows, administration of windows on the network, should applications go on hard drives or on the network?, need new PCs with larger disk capacity, more memory, faster ... Enough about my job. I hope to learn a lot in this class and look forward to the good that's to come.

C 103.7 CC 3.20 XXXXXXXXXXXXXXXX 2/22/95 10:34 PM 9 lines Subject: This is where everyone introduces themselves

Hi there,

My name is XXXXXXXXXXXXX, I'm a Rutgers Information System Major and I plan to graduate over the summer. I really don't have any technical or work experience besides messing around with my one computer.

Class Clarifications

In addition to the above during the first week of the course there are a number of comments related to clarifying the early assignments and setting a due date for the first case study report.

**C 103.7 CC 5 Murray Turoff (Murray, 103) 1/15/95 1:18 AM 12 lines
KEYS: warning Subject: start thinking about your project now**

You should start thinking about what you want to do your project on NOW and not wait till the last month of the course. You should choose your review to be in the area you wish to work on.

Many students do not realize the difficulty of finding "good" material and the time and effort to do so. We will be focusing on professional literature and not material from trade magazines.

You should skim my lecture notes to get an idea ahead of the range of topics we are talking about. There are lot of areas where my lectures will only skim the surface and you can go deeper into it.

Some students are very quick to begin to ask questions and to consider the assignments. They often want quick feedback.

**C 103.7 CC 11 XXXXXXXXXXXXXXXX 1/28/95 11:22 AM 14 lines
Subject: Article Review R: 1/1**

For the article review, I have selected the following: Ferrat, T.W., L.E. Short, "Are Information Systems People Different? An Investigation Of How They Are And Should Be Managed," MIS Quarterly, September, 1988, pp. 426-443. There is no volume # or issue # that I could find.

I think this article will show why people who are IS are managed differently. It may also show that IS people need to be managed differently compared with other people.

I hope this article is O.K.

C 103.7 CC 11.1 Murray Turoff (Murray, 103) 1/29/95 3:08 PM 1 line

Subject: Article Review

That is a perfect choice of an article!!

Discussion Questions

The second week another question is introduced which is a relatively easy assignment but encourages the students to share their experiences. The objective of this exercise to convince the students that the problem of managing computer and information systems is a very real problem and that many companies of all types and sizes can get into major problems with this technology.

It should be noted that some of the answers lead to interesting comments by other students.

C 103.7 CC 12 Murray Turoff (Murray, 103) 1/29/95 3:18 PM 17 lines KEYS: bad management examples/Question/Activity/ R: 14/0 Subject: Examples of bad management

This is your first assignment for a discussion online and it is a QUESTION ACTIVITY.

Those of you who have had work experience may have run into problems that have occurred with the development or introduction of a software system. I would like you to tell us about one such problem you have seen first hand and also take a stab at trying to explain what sort of underlying management problem might have been the cause. This should be no more than a page.

It does not have to be of the scale (1.5 billion) of my examples from Business Week. It can be quite small scale.

Those of you who have not had such an experience or no work experience need to find another news item (Wall Street Journal, New York Times, Business Week, etc.) about a development disaster and tell us about it and give us the reference to the news article.

Some of the answers by the students will generate comments by the instructor and even a certain amount of discussion

C 103.7 CC 12.6 XXXXXXXXXXXXXXXX 2/4/95 11:25 AM 54 lines Subject: Examples of bad management R: 1/1

I don't know if this qualifies; but, in December of '94, we (MIS dept) upgraded from 250 user to 1000 user novell network and had major printing problems! Before the upgrade, we used lanspool for managing network printing. One secretary PC out of every 4 was a controlling PC

That controlling PC had to be logged into the network in order for anyone (firmwide) to use the printer it controlled (did that make sense?). We were told by our vendor that lanspool did not support 1000 user network. They recommended we go with something called Print Assist which did support 1000 user networks. Well, print assist was real nice to work with as it was easier to set up than lanspool. With lanspool we had to setup on every PC that was going to control a printer. You didn't have to do this with print assist; could do everything at one PC. So, print assist was setup. After the weekend 1000 upgrade and testing (login and printing), everything appeared to be fine. Oh but when Monday came, the crisis. (During our testing, we didn't login every PC and printer in the entire firm, that's hundreds of equipment.) To make this long story short, any user who controlled a printer, and who had a login connection over 250 had big printing problems. They could not print nor could anyone else who needed to use the printer they controlled. So, in order to ensure that those users who controlled printers got a connection below 250, we (MIS staff) started coming in around 8: 00 a.m. for the next 3 weeks. The manufacturers of Print Assist were notified that their product did not work as advertised. They were trying to find a fix for us. In the meantime it created a hell of a lot of problems. Eventually we went back to another version of lanspool that claimed to support 1000 user network if you do x, y and z. The people at Print Assist long afterwards came out with a patch for its product, but we got burned already and haven't tried it again. As for our vendor who recommended print assist, they said they told us (which means the MIS director) that we had to test the product ourselves and that they never claimed to have actually worked with print assist themselves. Network printing is one of our biggest headache. And we catch a lot of flack from users who cannot print. Perhaps MIS should have investigated print assist a little more. For instance, find out if another large firm or company with a 1000 users or more used print assist or know anything about it. Perhaps MIS could I have contacted the makers of print assist themselves for any information. Actually, their product advertised 1000 user network support. Investigated further what options we had with lanspool, because that's what we ended up going back to. MIS biggest problem is that we're , in my opinion, understaffed.

C 103.7 CC 12.6.1 Murray Turoff (Murray, 103) 2/4/95 5:56 PM 6 lines
Subject: printer problems

A very interesting aspect of your example is that I suspect none of the your regular users cared whether it was your vender or your consultant firm that made a mistake. They BLAMED the MIS people which is the natural thing for them to do. In their thinking it was your mistake to trust the vendor or to pick an incompetent consulting firm.

C 103.7 CC 12.11 XXXXXXXXXXXXXXXXXXXX 2/9/95 3:02 PM 49 lines KEYS:
bad management Subject: Examples of bad management R: 1/3

There is one example of bad management that I would like to mention here. It was about a year ago when I was employed by a small mail order firm. I was a junior programmer in the company for about 2 months when the incident took place. Due to the business expansion and high demand of the Christmas season there were serious concerns about modifying the information system. This lead to the decision by the upper management of the company to ask the IS department to develop a project that would speed up the processing of customer orders within hours rather than 2 days, which was the current

situation. This resulted in the development of a project which would automate the file-transfer to the DMGT network for the credit authorization and other processing matters. Several phases of the system had to be re-programmed or at least modified to some extent in order to complete the project. We, the team of 8 available programmers for this project needed at least a month to complete the project but we were given only 2 weeks by the system operator as he could not object to the upper management somehow. This was clearly the case where the upper management had clearly overlooked the limitations of the IS dept. and systems resources. Although at the end of 2 weeks we were able to completely code the project, there were some parts of the system that had to be tested to finalize the project. However, due to the constant extensive pressure from the upper management, the system operator decided to implement the project into the main system without extensive testing and debugging, which was a must. The systems seemed to be working fine with the DMGT file transfer and credit processing and there was no problem until the middle of the day. The system all of a sudden crashed during the DMGT transfer. After verifying with DMGT, it was concluded that it was our system that had the problem. This resulted in the complete mess of several customer files and financial data. Fortunately we had the Backup working to recover most of the data. After hours of mind-sweeping debugging, we were able to find the bug and fix it. As we looked at the problem, it seemed that one routine had been not modified by the senior programmer to comply with the newly formed routines of the project. This multiplied the error several times through the processing with in-appropriate data when the order size of a customer had exceeded a certain limit. The fact that the upper management unfairly insisted on the implementation of the project within insufficient time and the fact that the system manager of the IS Department agreed to that, somehow seemed to be the main reason for the whole disaster. Although the problem was solved within hours, it certainly depicts a poor management situation in the company.

C 103.7 CC 12.11.1 Murray Turoff (Murray, 103) 2/9/95 8:29 PM 6 lines
Subject: common problem but there is a recourse R: 2/2

I suspect management held you programmers to blame rather than themselves. In situations like that the senior member of the programming group should write a memo for the record with everyone signing it that the group did not feel there was sufficient time allowed for adequate testing. I am serious about doing such things when unreasonable requirements are laid on the technical people.

C 103.7 CC 12.11.1.1 XXXXXXXXXXXXXXXXXXXX 2/12/95 2:41 PM 13 lines
Subject: unreasonable expectations with few resources R: 1/1

The recourse that you suggested seemed to be the logical solution that came to our mind at that time. At about halfway through the project, we also tried explaining to the management that even though we could finish the project, there was insufficient time for the adequate amount of testing as you mentioned. However, the request was reviewed, and then ignored by the upper management. Although I hate to mention any individual reference to that situation, I personally felt (just like many of us in the company) that the president of the company (who was the owner too) had too high expectations for the amount of resources he had provided to the IS department and other departments. This

was one of many other unreasonable expectations that many departments had gone through.

C 103.7 CC 12.11.1.2 Murray Turoff (Murray, 103) 2/12/95 5:06 PM 8 lines
Subject: unreasonable expectations or a style of management

A book I highly recommend is "the soul of a new machine" by kidder. It is a major computer development effort in data general which was well documented and it talks about all the practices to get technical people to work 70 hours a week when they are only paid for 40 and how to spend five years skimming the cream before firing them and hiring new naive younger fresh graduates to repeat the cycle. Also how to practice "mushroom management (keep in the dark and feed them lots of ...)

C 103.7 CC 12.8 XXXXXXXXXXXXXXXX 2/6/95 5:44 PM 18 lines Subject:
Examples of bad management

I have two examples of what I consider bad management. My first example at the company I presently work at we implemented a new system for claims processing. The system had so many bugs in it, it took approx. 30 months on a project that was scheduled to be done in 12 months. The cost of the project was and still is a big secret, but a lot of people lost their job for poor management judgment. The other case was at an another insurance company that had so much computer technology that I believe only one person in the whole company knew how to operate most of the equipment or what is was used for. I was a computer operator at this company and never was giving technical training or any kind of training on this equipment, but when problems came up I was suppose to know how to fix and correct these problems. Very poor management.

Throughout the course a number of questions were introduced as both a stimulus to discussion and as a way of providing the instructor insight into the manner in which the students had absorbed the readings and lectures.

C 103.3 CC 20 Murray Turoff (Murray, 103) 10/4/94 1:58 PM 36 lines KEYS:
/Question/Activity/ Subject: new technology and risks

In the first case study we saw that one of the factors to consider is the RISK that a manager has to take when introducing a new technology.

Certainly real time systems was a new technology in those days and different than the batch programming environment. Therefore it was unlikely that Heller had the technical people who understood this new area.

We mentioned the example today of introducing object oriented programming in a computer development environment where all the programmers had never been trained in this technology and had not been regularly updated. Clearly a manager would feel a great feeling of risk in requiring all his current COBOL programmers to begin doing things in SMALLTALK.

What is a recent or current example of new technology in information systems that carries with it certain risks if a decision is made to introduce it into the organization. What are the specific risks or risk and what actions or practices should the manager take to reduce the risk of introducing this technology? What factors in the current organization might make the risk so great that the manager might rightly decide that it is too soon to introduce this new technology?

You can go back up to ten years and talk about the introduction of a prior technology instead of something current if that is easier to consider. For example, there are examples of companies that have chosen not to network their PC's even today, even though the technology has been around for a while. What risk factors might explain that example?

Pick a specific technology (hardware or software) and discuss the risks of introduction and the actions to minimize those risks. You should be able to do this in less than three screens.

C 103.3 CC 20.2 XXXXXXXXXXXXXXXXXXXX 10/12/94 11:37 PM 15 lines
Subject: new technology and risks

This is a topic that is near and dear to my heart. I have been studying relational technology and structured analysis for about five years now. I have found that most upper management type have no idea what the benefits of this technology can provide them. It has been very frustrating! The bottom line is that the information that supports a corporation's enterprise has been deemed (recently) as a corporate asset - that is it can be used as a catalyst for service and growth (in the form of new products). The problem remains that most upper management have been left behind in the technological realms and don't understand the flexibility available in designing your company's data. My only hope is that in 5 to 10 years there is a resurgence in the industry of technology comprehension that allows techies like me to make wave and progress in the business.

Sometimes it is rather surprising what topic generates a very active discussion. It is advisable to allow the students to continue the discussion and wait till it has slowed down before inserting any further insights or considerations.

C 103.3 CC 20.3 XXXXXXXXXXXXXXXXXXXX 10/14/94 11:37 AM 26 lines
Subject: new technology and risks R: 2/9

The technology that I will discuss is the use of scanners in all types of stores. If, for instance, a supermarket decides to install such a system, there are certain things that must be considered. First of all, besides buying the scanners, a new machine must be bought to hold the centralized database. This database must constantly be maintained and must be updated every time there is a sale, and also when the sale ends. This means that new employees must be hired to do the job. The charges made by the scanners at the checkout counter will probably be part of an integrated package, so there will have to be computer personnel to make sure that the integration programs flow shamelessly. Another point to consider is how the present checkout employees feel about the systems. They may feel

intimidated by the machines, and when the scanners don't work, they may feel that they are more trouble than they are worth. It has been my experience that the scanners may help the stores with their inventory and accounting, but does very little for consumers. The use of scanners hasn't diminished the time spent on checkout lines at all. In some case I would say that they increase the time. This is due to dirty scanners, bad bar code labels, or entries not in the system. Also, studies have shown that scanners overcharge up to 23% of the time. If consumers become more aware, or fed up with the time it takes for cashiers to keep scanning products because it won't pick up the codes, then some of these places might lose business. If a company is small, then they might decide that the startup cost of adding scanners might be too costly. Also, they may not want to hire new people to maintain the database or the software, and they may not be sure that the current employees would readily adapt to a new system.

C 103.3 CC 20.3.1 Murray Turoff (Murray, 103) 10/15/94 1:00 AM 5 lines
Subject: new technology and risks

Remind me in class to talk about the error checking system in a welfare system. It does seem like most systems always error against the consumer and I suspect it has something to do with the objectives of the design.

C 103.3 CC 20.3.2 XXXXXXXXXXXXXXXX 10/16/94 1:55 PM 36 lines KEYS:
point-of-sale/supermarket/database/risks R: 7/7 Subject: new technology and risks

I gotta respond to this scanners problem.

Scanners are a method of point-of-sale data entry. As such, it requires the kinds of controls that data entry usually has: rules, functions, and an administrator.

As with any computer application introduction, there needs to be a clear direction handed down from management: we WILL use this, and this is exactly HOW. If a supermarket wants scanners, they must commit to keeping their stock database ABSOLUTELY current. A dirty barcode is no excuse, neither is a dirty laser head. The actual laser scanning is only an extension of the database you are using: UPC codes as indexes into the database. If your supermarket can say: yes, we will keep the UPC database clean and current; you can implement it with little problems. As a fallback, keying in the UPC number should work just as well, if slower, than the scanning. Overcharging is a problem of maintaining the database. Errors in entry are unacceptable: your screen should popup what the product is, i.e. 0090 is Rice Krispies, 25 oz, \$3.59 and 0098 is Shoe Polish, 3 oz. Black, \$2.29, so key-in errors are minimized if the cashier pops in 0090 and has a can of shoe polish in hand. Dirty scanner heads? Come on. Excuses excuses. If the cashier can't see it's dirty, are you hiring the blind?

Point-of-sale has its startup costs, its inherent need for database administration to be strict and disciplined, but I find it to be far more valuable in the long run. No more individual pricing, instant discounts, automatic generation of sale-labels for the item's location on the shelf, quick sales information, FAR more data for sales analysis than ever possible...

Of course, I could be full of it.

C 103.3 CC 20.3.2.1 XXXXXXXXXXXXXXXXXXXX 10/16/94 2:05 PM 10 lines
Subject: new technology and risks R: 1/5

XXXXXX, Everything you said about scanners is true in theory. However, in practice, I have seen dirty or scratched glass that causes the scanners to work at less than peak performance. Also, when there is a big sale going on, a lot of prices have to be changed. The people doing this might become bored or tired, and they could key in the wrong information. From a company standpoint, I believe scanners are a great asset. But, customer satisfaction might keep the business afloat.

C 103.3 CC 20.3.2.2 XXXXXXXXXXXXXXXXXXXX 5 lines 10/18/94 4:30 PM
KEYS: scanners/risk Subject: Scanners are nice.

This isn't a problem with the scanner technology, it's a problem with the people.

C 103.3 CC 20.3.2.3 XXXXXXXXXXXXXXXXXXXX 10/18/94 4:43 PM 4 lines
Subject: Scanners are nice.

I agree that it is a problem with the people, but people are also a resource of a company. All your resources should mesh, or problems occur.

C 103.3 CC 20.3.2.4 XXXXXXXXXXXXXXXXXXXX 6 lines 10/19/94 11:05 PM
KEYS: scanners/risk/management Subject: Scanners are people too?

Ah, but then it's no longer a risk of technology, but a function of your training for employees, and the technology issue becomes moot.

C 103.3 CC 20.3.2.5 XXXXXXXXXXXXXXXXXXXX 10/20/94 4:23 PM 5 lines
Subject: Scanners are people too?

I think that it is as much a risk of technology as it was when going from COBOL to RAMSIS II. Both sets of employees must be trained, and in both instances, some will be good, and some will be bad.

C 103.3 CC 20.3.2.6 XXXXXXXXXXXXXXXXXXXX 10/20/94 7:10 PM 2 lines
KEYS: cis455/technology Subject: new technology and risks

no way man. You're right on. Discipline, hard work and tenacity are the best road to excellence

C 103.3 CC 20.3.2.7 Murray Turoff (Murray, 103) 10/22/94 9:54 PM 10 lines
Subject: psychological problems cause risk too

Don't forget the psychological problem. A person who learned to master an adding machine and remember many product prices will feel that they are being deskilled and

resent that now any high school student can do their job without much training. Not the level of professional mastery that they obtained. By the way have you ever been in a market line and their was a missing price code that could not be scanned. It causes quite a turmoil. I had printing in high school and learned to set type and run a press. Glad that I did not choose to follow that as a profession. But they are a good example of a displaced skill no longer necessary. Printers had a great deal of professional pride in their skills as crafts people.

Some questions are constructed to be extremely relevant to the student so that they will generate very considered responses.

C 103.3 CC 82 Murray Turoff (Murray, 103) 11/15/94 3:01 PM 14 lines
KEYS: professionalism/Question/Activity/ Subject: determining professionalism of an organization

As we discussed in class one of the key concerns for all of you is determining the degree of professionalism in the organization that you are interviewing for a job.

What are three signs you might notice on your visit to the organization that might be a sign of a professional organization?

What three questions would you expect them to ask you if they were a professional organization?

What three questions would you ask them to try and determine with they were a professional organization?

C 103.3 CC 82.3 XXXXXXXXXXXXXXXX 11/23/94 8:49 PM 16 lines KEYS:
professional/interviews Subject: determining professionalism of an organization

3 signs of a professional organization: 1) Multiple interviewers including manager, technical manager and future (potential) collages 2) A library of manuals, reference materials and documentation 3) High quality equipment (on desktops)

3 questions they would ask of me 1) What are your recent achievements, both technically and administratively 2) What are doing with your education and what are your future plans 3) What are your career objectives

3 questions I would ask of them: 1) what is your management hierarchy 2) what are your education and training policies 3) what is the IS strategic direction for the next 1 and 5 years

Some questions do stir up considerable disagreement and discussion

C 103.7 CC 85 Murray Turoff (Murray, 103) 4/17/95 3:51 PM 44 lines KEYS:
medical records/Question/Activity/ Subject: ethical issue activity R: 16/0

We have not had much of a chance to talk about professional responsibility and ethics. So here is a QUESTION activity where you need to answer this with what you would do if faced with the following situation and why you would do this.

You have just jointed an elite group of systems people responsible for the databases in the corporation. This is about nine programmers and systems people. The maintain all the key central corporate data bases.

This is a wonderful job opportunity and of course you are the junior person and newest to the group.

One of the members of the group has let you know that one of the data bases is medical records of a yearly physical that the company gives to all its employees.

Some of the programmers have developed some special search routines available as part of the maintenance software that only this group has access to. This allows them to search for such things as single females meeting certain physical criteria and allows them access to such information as methods of birth control used.

Clearly this is used to pre determine which females in the company they would like to meet and date.

Clearly this is an all male technical group and you are to answer this assuming you are male as well. Among your choices might be such things as:

- a) join in the fun
- b) don't participate and ignore it
- c) urge them to stop
- d) report them to management
- e) report them to NOW and / or the ACLU, etc.
- f) contact the star ledger
- g) go to the ACM ethics committee
- h) look for insight in the ACM code of ethics etc. etc.

So what would you do and why. This is an ACTIVITY and should be answered as one. Once you answer you can discuss and comment on the other answers presented. I will hold off saying anything until I feel there has been adequate discussion.

C 103.7 CC 85.1 XXXXXXXXXXXXXXXX 4/18/95 12:04 PM R: 1/4 29 lines
Subject: ethical issue activity

Ethical Responsibility

The truth of the matter is that I would probably join in. I am only human. But I think that once things started getting out of hand, I would probably refrain from the temptation of all the possibilities that were available to me. I do not think that any man in his right mind would not be tempted to act on this advantage of the job. So, of course, there would be widespread participation throughout our programming and systems group. I am not saying that it will and will not get out of hand because there are always some people who will get

guilty and stop, and there are people who just do not know when to stop. The chances of things going crazy would be a little over 50%. But I doubt that it would get that far without being noticed by someone in management. What I mean about getting out of hand is that knowledge of this might leak into the rest of the corporation to a few employees who may want to join in on the fun, or the possibility that the women in the corporation find out that our group is slowly dating an increasing number of them and they want to find out why. In a situation like this anything and everything can happen. There is no limitation on the damage and trouble that can be caused. Personally, I think that after a while, I would grow tired of the game and eventually stop. But I would not report it. If things are found out, I will take responsibility for what I did, but no one else's. I will not be used as an escape goat or use anyone as my escape goat. But in this dog-eat-dog world of ours, I would probably get fired for the whole mess (after all I am the junior member of the group).

C 103.7 CC 85.1.1 XXXXXXXXXXXXXXXXXXXX 4/23/95 8:06 PM R: 3/3 5 lines
Subject: ethical issue activity

Lloyd, That's right. You're only human and for that fact alone I think you should refrain yourself right now before things get ugly. Besides taking advantage of others is morally wrong, and can cost you your job. I think it would be best not to invade the privacy of these females now. Don't you?

C 103.7 CC 85.1.1.3 XXXXXXXXXXXXXXXXXXXX 4/24/95 6:51 AM 13 lines
KEYS: reply Subject: ethical issue activity

Hi everyone, I read many responses about this ethical issue. In most of them I noted one important concern: "being new in the company". In response to that, what about following the ethical code of privacy and access to justify the overall good for the company? The ethical code does not differ for a new employee and a senior employee! I think that there is a lot more to this issue than just "having fun" when it gets out of hand eventually. In any case following fun" when it gets out of hand eventually. I think that temptation of getting involved in this activity is very high but as responsible professional, we ought to think better. Refraining from this activity is an easy choice to make, but is it the best choice? I don't think so.

Class Guidance

There is considerable reading material in the course and the students are provided early in the conference with a set of sample questions as a guide to the readings. This set of sample questions is stored in an instructor's notebook and the ATTACHMENT ITEM facility is used to convey that existing item to the class conference.

C 103.7 CC 15 Murray Turoff (Murray, 103) 1/31/95 9:59 PM 4 lines KEYS:
exam/samples/questions/Attachment/Item/ Subject: sample questions for exams in
this course

To help you in doing your readings and reviewing the lectures I have attached samples of questions I have used on past exams. This should give you the best possible idea on what are the things I consider important for you to learn as a result of this course.

ATTACHMENT:

C 103.4 CC 19 Murray Turoff (Murray, 103) 1/31/95 9:55 PM 30 lines

KEYS: sample/questions/mois Subject: sample questions for Man. of IS

Sample Questions:

Describe a significant management issue, policy issue, or planning problem associated with the introduction of each of the following technologies into an organization. It should be something specific to the technology rather than general to any introduction of a new technology. (I could put any changing technologies here)

What are the decision and agreement points in the development process? Clarify for each one: when it occurs; what is the decision or agreement required; and who is involved.

How would Mowshowitz classify each of the following and why? (I could put in people and organizations you know about)

What the danger signs or primary conditions that could lead to a software development project getting into serious trouble and becoming a "runaway?" For each item explain how you would detect it early.

What do you consider the most promising three approaches to increasing software productivity and/or applications development within the organization. Explain why and highlight any potential dangers of these approaches.

C 103.7 CC 68 Murray Turoff (Murray, 103) 3/28/95 4:09 PM 25 lines KEYS: exam Subject: exam

In response to a message I receive I NEVER ask multiple choice questions, don't believe in them. My questions either require lists of answers (short phrases) or short one to three paragraph essays. There have been example questions placed in this conference.

For this exam I expect the students to be prepared to answer anything about the software development process as covered in the lectures. I also expect you to be able to answer anything about the two required professional articles.

In the book part II gives important insights as to how specific technologies can affect the organization and its management and operation. Part iii gives additional insights into my lectures on development with a lot of examples and some insight into the history of the area.

Chapter 11 is not too important but chapter 12 is. Finally the specific technologies in chapters 13 to 16 give an important feel for how these four technologies impact the organization. You can ignore part vi for this exam.

Note the book gives references for each chapter and covers most of the areas you would do topics on so you can use it as a starting point into a topic

The student must select a professional article to review and often undergraduate students do not understand the distinction between a professional journal and a trade magazine.

C 103.7 CC 47 XXXXXXXXXXXXXXXXXXXX 2/26/95 8:47 AM 10 lines Subject: ARTICLE REVIEW SELECTION R: 1/1

I'd like to review the following article:

Moad, Jeff, "WANTED: The Multithreaded CIO", Datamation, v.40, April 15, 1994, pg. 34-38.

This article is relevant because it discusses what it takes to be a good CIO. This article lists the 9 commandments for CIOs. For an aspiring CIO, its an interesting reading.

C 103.7 CC 47.1 Murray Turoff (Murray, 103) 2/26/95 7:06 PM 9 lines, Subject: article not approved

XXXXXX, DATAMATION is NOT a professional journal and therefore articles there are not allowed. For the review you must find an article in a professional journal and NOT a trade magazine. For the project one can have about a 1/3 of the references in trade magazines but the rest have to be professional articles. To start with professional articles reference prior work upon which they are building. Most trade articles have no references and do not spend any real effort on explaining the evidence leading to a conclusion.

Other Assignments

Having the class on line provides other opportunities. One assignment was to have the student experience INTERNET and see how it lives up the press about the revolutionary "Information Highway."

C 103.7 CC 26 Murray Turoff (Murray, 103) 2/13/95 1:36 PM 23 lines KEYS: assignment/internet/www/Attachment/Item/ R: 1/3 Subject: assignment: explore internet (information highway!)

A new assignment is to go into Internet and find something of use to us in this course and to tell us in this conference what you found and how we could get it or if it is short bring it back and make it an attachment.

You can get to the World Wide Web from EIES by entering +WWW also other NJIT machines have a WWW command so you can use other machines you may have an account. check with the Computer Services or if any of you know the other access you might comment here. You have seen a great deal of press about the "Information Highway and you can go spend a few thousand dollars on seminars for business men to tell you how to make money using Internet. The hoopla has arrived and you should all experience Internet and find out what it is really like and make an assessment for the rest of us. In conference 1.1 I put a 100 line item giving frequently used sources of information on internet. As an attachment to this comment I am providing an 1100 line item downloaded from internet and titled "frequently asked questions about internet" and it will give some background for those of you new to Internet. Exploring new technology and understanding it is one of those things you have to always be ready to do in the job environment and this is therefore a very real sort of assignment.

An example of a response to this assignment is as follows:

C 103.12 CC 12.1 XXXXXXXXXXXX 2/17/95 12:20 PM

46 lines Subject: surfing the net as an assignment in this course

First off to "Surf the Net" I use Netscape, a very user friendly graphical browser on a PC hooked to the Network system here at NJIT.

If anyone is interested in seeing what all the hype is about it can be seen in the Co-lab on the 4th floor of ITC, you may have to request an account or maybe the assistant on duty can show you in his account.

Search Engines are used for exploring the "Net." The most popular one that I know of is at <http://www.yahoo.com/> after entering this URL you will get a window with a search box in it. This is where you type key words for your search (separated by spaces) I typed:

mis management information systems

and this is one it returned along with many others. I'll just put one so as others who may find them with the same search or different keywords may use them. Remember you can type whatever you want in this box. You could type : music <group name> and get a page that contains info and/or sound clips of your favorite music group, etc. For now though, I think we should find one related to MIS first so Murray doesn't get mad at me..... :)

Heres one I looked at

<http://www.cox.smu.edu///mis/misq/central.html>

The page is described as: "an electronic extension of the MIS Quarterly."

(*text* indicates actual links at the site.)

"This well respected scholarly journal publishes research focused on information systems (IS) management."

That's how they describe it as seen in the first paragraph on the page.

There are many different links, such as *MISQ Archivist* which contains past issues, it's own search capability and more.....

There are other main sections such as *MISQ Discovery* and *MISQ Roadmap*.....

For those of you who have a genuine interest in MIS, if you look through this page and it's links you'll see that you can interact with the people their via e-mail or you can submit various works of your own...

Have Fun XXXXXXXXXX

The student is required to present his or her choice for a final project report which presents at least three relevant references. What follows is a sample of that entry and the discussion that resulted between the student and the instructor.

C 103.7 CC 94 XXXXXXXXXXXXXXXXXXXX 4/25/95 3:01 PM 23 lines R: 1/3

Topic for my final project: Title: Video Conferencing, has it made Telecommuting a reality for employer and employee.

Abstract: With the price war lowering prices, and the vast research regarding Video Conferencing, the concept of Telecommuting in the work place is now a reality, or is it? Nevertheless, companies are taking advantage on the benefits of TELECOMMUTING, and managers and employee are seeing some of the rewards as well as the heartaches.

References obtained:

1. Fryxell, David A, Telecommuting, Link-Up, vol. 11, iss: 3 date: May/Jun 1994, p: 18-19
2. Maynard, Roberta, The Growing Appeal of Telecommuting, Nation's Business, vol: 82, iss: 8, date: Aug 1994, p: 61-62
3. Taylor, Kiernan M., WAN Videoconferencing without High-Priced Hardware, Data Communications, vol: 32, iss: 17, date: Nov. 21, 1994, p: 45-46
4. Zeile, Art, Bridging the gap in Corporate Communications, Satellite Communications, vol: 18, iss: 10, date: Oct 1994, p: 22-24

Please let me know if my topic meets your requirement for the Final Project. Thank you.

**C 103.7 CC 94.1 Murray Turoff (Murray, 103) 4/25/95 3:21 PM 8 lines
Subject: be careful of this topic R: 1/2**

If it involves video conferencing and video use through computer digital networks it is appropriate. But video conferencing as an analog process is just like audio phone conferencing and it is not relevant to this course. Multimedia conferencing over networks is the appropriate topic and you can use insightful information from experiences with video but the technology is not video conferencing in the traditional video conferencing sense

C 103.7 CC 94.1.1 XXXXXXXXXXXXXXXXXXXX 4/27/95 7:56 PM 5 lines
Subject: be careful of this topic R: 1/1

So, if I focus my paper on topics such as video conference and video use through computer digital computer network, or multimedia conferencing over network, or related experience, it will be appropriate for my paper. In addition, is information regarding management issues about video conferencing okay also? Please advise.

C 103.7 CC 94.1.1.1 Murray Turoff (Murray, 103) 4/28/95 6:29 PM 3 lines
Subject: be careful of this topic

Management issues of multimedia conferencing over computer networks including the use of video, but not only considering video use of the network, would be appropriate.

The student's review of a professional article and an executive summary of the final report go into a separate conference since these are items that do not usually generate discussion. Examples of these are:

C 103.7 CC 31 Murray Turoff (Murray, 103) 2/19/95 4:56 PM 16 lines KEYS: reviews/103.6 R: 1/3 Subject: article reviews and project summaries conference

When you are ready to do your article review you will enter it in Conference 103.6. I have made you members but you have to enter it to trigger the membership.

Be sure to read the first comment where I give instructions on how to format and utilize keys and subject fields. If you do not follow the instructions you lose grade points.

You can see the reviews and executive summaries done by the students last semester. They are in this conference. When you enter the conference you can use the Intake command to move the existing items waiting to accepted after you look at the first comment.

I would like to see all the article reviews put in by no later than the end of the spring break.

C 103.6 CC 1 Murray Turoff (Murray, 103) 10/12/94 11:11 PM 16 lines
KEYS: format Subject: article review format R: 1/3

This conference is where you will put your article reviews and later on put your executive summaries for your projects.

For an article put in a short form of the title of the article as the subject for the comment.

For the keys please put in the following keys

/first authors last name/ /journal title/ /volume(issue)/month year/

Be sure to put the complete reference at the start of the content as well. In the keys use a shorter form of the journal title like for "Communications of the ACM" you can use CACM

**C 103.6 CC 44 XXXXXXXXXXXXXXXX 3/23/95 5:14 PM 49 lines KEYS:
/Ferratt/MISQ/12(2)/1988/ Subject: Article Review**

Ferratt, T.W. and Short, L.E. "Are Information Systems People Different? An Investigation of How They Are and Should Be Managed". *Mis Quarterly*, September 1988, Pages 426-443.

This article specifically examines whether IS and non-IS people are or should be managed differently. The findings that the authors found are based on experimental studies regarding the differences between the two groups in terms of their work-unit environment and productivity. Two very important research questions are carefully examined during the course of the studies: 1. Do work-unit environments differ for IS and for non-IS people? 2. Is the relationship of work-unit environment to productivity different for IS and non-IS people?

To reach a relatively reliable answer, the authors emphasize on three sets of managerial activities: 1. Enriching the job. 2. Attending to interpersonal relations, involving the employee, and reinforcing work behavior. 3. Attending to production and targeting work behavior. It is found that within each of the three different occupational groups - Clerical operations, Technical professional, and Managerial employees - that there is no difference between the work-unit environment of IS and non-IS people. Also, some findings suggest when comparing two occupational groups - Technical professional and Clerical operations people - where productivity measures were obtained that there is no relationship for IS and non-IS people. Thus, the findings arrived to the conclusion that IS and non-IS employees at the same occupational level are not and should be managed differently.

Although the results of the study are to some extent correct, there is much debate regarding its correctness because the study was done using a field survey from a non-random sample of insurance companies rather than from some experimental or scientific methodology. Moreover, a limited set of managerial activities and employee behavior was investigated. And that is what prompt other researchers who have done some studies in the field to question the validity of these findings. According to the research study, although the differences in individual characteristics within IS and non-IS people have been investigated previously, the studies of motivational differences was the way of investigation which is why a limited set of characteristics within each individual was examined.

They do not investigate differences in the relationship of the environment of employee behavior or environmental characteristics. Instead, the study requires two explorations that need to be investigated in order to find the differences between IS and non-IS people. First, it uses analysis of the new scales which is validity and reliability of the resulting scales that measures the directions. Second, it uses the identifications of a limited number of types of work-unit environment. As a whole, this study mostly concerns about the behavior of employees which depend on the person and the work-unit environment. The authors used a survey instrument to ask questions about the work-unit environment, the organizational environment, and individual characteristics, where work-unit which is the most important is represented by the three major managerial activities mentioned earlier. In the second set, work-unit environment is represented by four different types of work environment identified in exploratory analysis: 1. Low on all the three dimensions. 2. Mid-range but relatively high on attention to production and targeting work behavior. 3. Mid-range but relatively low on attention to production and targeting work behavior. 4. High on all the three dimensions. In the first research, there was no significant difference at the 0.05 level of significance between IS and non-IS. In the second research, there was no interaction effect that differed from 0 at the 0.05 level of significance. All the results lead to the very same conclusion. That one should not accept that the relationship of work-unit environment to productivity does not significantly differ for IS and non-IS people. This concludes that managers should establish the same work-unit environment for IS and non-IS personnel at the same occupational level. Assuming that the above studies are reliable and some of the other research do not prove otherwise.

Exam question: Would there be a difference between the skills required for non-IS personnel to perform IS tasks, even though the motivations and work-unit environments may not be different?

**C 103.6 CC 33 XXXXXXXXXXXXXXXX 3/18/95 2:14 AM 97 lines KEYS:
/Farley/Richard/RMFSP/IEEE SOFTWARE/VOLUME 11/ISSUE 3/MAY 1994/
Subject: Article Review R: 1/1**

Farley, Richard, Risk Management For Software Projects, IEEE Software, Volume 11, Issue 3, May, 1994, 57 - 67

The article I reviewed described a seven step procedure that shows Project Managers a way to identify risk factors that effect software projects. The article also shows how to formulate a contingency plan and how to conduct risk management. Included in the article a case study that shows each step in action. 1) Identify risk factors 2) Assess risk probabilities and effect on the project 3) Develop strategies to mitigate identified risk 4) Monitor risk factors 5) Invoke a contingency plan 6) Manage the crisis 7) Recover from a crisis

Identify risk factors- A risk is a potential problem, a problem is a risk that has materialized. When does a risk become a problem should be decided by all parties. In the case study the six risk factors that were identified were time, available memory, lack of experience with the hardware, lack of adequate software tools, uncertainty of estimated code size and the complexity of software.

Assess risk probabilities and effect on the project- First you must estimate the probability the risk will become a problem and what effect will it have on the project. In the case study he uses similar project evidence, analysis and some mathematical equations to determine probabilities and effect. A probabilistic cost model table was created taking the previously listed risk factors into consideration.

Develop strategies to mitigate identified risk- Once the risk goes over a predetermined threshold corrective action needs to be taken. The corrective action should be determined ahead of time. This is how a lot of projects get into trouble by not having a predetermined plan in case things go wrong. In the case study he suggest all affected parties publicly acknowledge risk factors and accept them and for them also to become involved in preparing the contingency and crisis management plans.

Monitor risk factors- You must accurately monitor the risk data. In the case study it is stated software is not a physical entity so not subject to physical laws and mathematical theories that is why it is so important to set thresholds and to stick to them. The only way to do that in a software project is by monitoring budget versus demonstrated value.

Invoke contingency plan- Contingency plan is invoked when the preset threshold is reached. Early in the project people always think that catch up is possible in the next phase, it seldom happens. If the contingency plan goes over preset threshold a crisis management plan is invoked. In the case study he gives step by step instructions for preparing and forming a contingency plan. 1) Specify nature of problem 2) Consider alternative approaches 3) Specify constraints 4) Analyze alternatives 5) Selecting an approach 6) Specify risk factors 7) Specify tracking method 8) Specify responsible parties 9) Specify thresholds 10)Specify resource authorities 11)Specify constraints

Manage the crisis- In spite of the team's best effort sometimes contingency plans fail. The next step is the crisis phase. In this phase there must be a plan to get the project through this phase, also in this phase a Drop Dead Date is decided upon. This is the date at which management must reevaluate the project. In the case study he gives elements of crisis management. 1) Announce and generally publicize the problem 2) Assign responsibilities and authorities 3) Update status frequently 4) Relax resource restraints 5) Have project personnel operate in burnout mode 6) Establish a drop dead date 7) Clear out unessential personnel

Recover from a crisis- After the crisis is over certain action is necessary, such as rewarding personnel that worked in burnout mode and reevaluate the project as in terms of schedule and budget. In the case study he gives step by step instruction of crisis recovery. 1) Consider crisis postmortem 2) Calculate cost to the complete project 3) Update plan schedule and work assignments 4) Compensate workers for extraordinary efforts 5) Formally recognize outstanding performances and their families The article was interesting, informative and not to mention long. It is a must read for anyone that one day will be in the position of software project manager.

Question for the exam: Name the seven steps for risk management for software projects and tell a little about each.

COURSE FEEDBACK

At the end of the course the last question that was asked was the following:

C 103.3 CC 98 Murray Turoff (Murray, 103) 12/14/94 7:52 PM 5 lines KEYS: /Question/Activity/ Subject: feedback on the course

Here is a final question activity which you do not have to answer till after I have done the grades.

What are the most important things I learned from this course and how would I suggest improving the course.

C 103.3 CC 98.4 XXXXXXXXXXXXXXXXXXXX 12/29/94 11:15 AM 30 lines KEYS: feedback Subject: Feedback

This course served as my first exposure to the business applications of our software design concepts, and gave me a good look at what kind of interactions are present when joining a firm, working within a firm, and even leaving a firm. It bridges a gap between theory and practice, and my conviction is that this type of course needs to be introduced earlier.

I learned how to apply my analytical thinking to business problems, and this was my most important benefit from the course. I found the case studies to be the most enjoyable, and the resultant discussions were very interesting.

The online activities are a good idea. There should be at least two a week. It should be stressed as an essential component to the classroom.

The final project should have been done from day one. I believe the projects would have been better if it was made clear that our ways of thinking should be deep and not broad. A 3-page paper the 2nd week, a 5-8 page paper by midterm, and a 15-page term paper at the end would be a better way of getting us used to what kind of thinking (and research) we should be doing.

C 103.3 CC 98.3 XXXXXXXXXXXXXXXXXXXX 12/27/94 5:40 PM 30 lines Subject: feedback on the course

I think that the most important things that I learned in this course are:

1. How to look for the signs of someone undermining a project.
2. How to evaluate a system not just by cost, but also by how much money it will save, and how much revenue it can be used to generate.
3. Throwing technology at a company's problems won't solve them unless the underlying reasons for the problem are addressed.

4. The signs to watch for to see if a project is becoming unmanageable, and is likely to become a runaway.

The thing I like best about the course is the use of EIES. It has its rough spots, but I think that it far enough advanced as to be useful. It is good to be able to discuss topics online with other people. It also helps to get constructive criticism from people other than the teacher. I also liked the idea of giving out the printout of the course notes to keep note taking to a minimum.

What I didn't like was trying to remember all those notes for the test. The notes are structured as headings followed by subheadings, much like a well developed outline. I didn't think that they had any substance to them, and trying to study them was like trying to remember a bunch of lists. Using them as supplements to the book would have been fine by me. I think that it is kind of tough to remember direct lists rather than concepts.

C 103.3 CC 98.1 XXXXXXXXXXXXXXXXXXXX 12/16/94 9:14 PM 14 lines Subject: feedback on the course

Oh boy! Now I don't even remember the wording of the question. Why, oh why didn't I write it down! Let's see it has something to do with what I learned. I learned a great deal about new technologies, both the technical side and the managerial side taught / researched. The insight I gained relevant to the managerial aspect was tremendous. I found the political aspect of implementing a project quite fascinating and I think most of the ideas/advice can be applied to any other project i.e. project that are not information systems related. I think I will use some of the contercounterimplementation advice and the other helpful advice in my community work. There are many sneaky "helpful" people who will covertly try to sabotage one's project simply because it was not their brainchild. Merry Christmas everyone! Got to go, Jamaica is calling.

CONCLUSIONS

The key problem that has occurred in all the offerings of the courses is the situation where students are starting the course out of synchronization with the other students. Underlying this has been the problem the getting the students all the materials they need prior to the actual start of the course.

The result is often that the instructor must track the progress of each student on an individual basis and can not rely on normal approaches to determining when a student is late and whether he or she is to be penalized. In addition, the efficiencies of being able to review all of the same homework assignment at one time and doing the grading is completely lost. It is many times more effort for the instructor to separately grade the same assignment many different times because of the setup and rethink time that is required.

Many aspects of this situation are not under the control of the Professor when they occur. For the remote student we have no way of determining when they have received what. It has been recommended that distance education needs to set up a tracking system by student so that there is a history of when a student registered, when a student was sent various materials and when the student made inquiries about specific problems and how they were dealt with. Such a history on each student by distance education would more easily clarify when a real problem exists and provide more meaningful information to the instructor when he or she has to check on a particular student.

Recommendation One:

There needs to be a tracking system to keep a record of the events dealing with a particular student including the tracking of particular problems that have occurred (e.g. being sent the wrong material).

The above problems have led this instructor to another conclusion upon which he has the power to take direct action. This has been the decision to get all the course materials that are created by and under the control of the instructor placed as HTML files on the Internet World Wide Web. While many students may prefer to buy clear printed copies of some of these materials, the availability of the material on the WEB would mean that the student could have initial access to these upon registering for the course. In this case this would include the full detailed syllabus for the course and the files of presentation overheads used in the lectures. For CIS 455 there are approximately 300 such overheads.

I have also chosen to make my vita and a number of recent professional papers available as well. This material is linked to my homepage for the four courses I regularly teach and have responsibility for. This includes the CIS 447 (Human Computer Interface Design) as well as the CIS 455. Both are electives in the BAIS and BSCS degrees now offered through Virtual Classroom. The material can also be linked from pages which describe the Distance Education Program in general and specific offerings in any semester.

Recommendation Two:

The material generated by a Professor for a course to be offered in the distance education program should be made available on the Internet WEB before the start of the course.

I also feel strongly that having this material publicly available would greatly aid the student in making an intelligent decision as to whether they are ready or able to take the given course. We now have too many students who sign up for a course and discover it is more work than they originally estimated. The offices they often deal with are not in a position, nor they have the talent to counsel a student as to how much effort a set of courses would be and to what degree they are prepared to take them.

Recommendation Three:

There needs to be a department advisor online on EIES who will act as a counselor to the students when they wish to discuss what they plan to take and when.

As the number of students builds up there should be more of an attempt to encourage the types of activities on campus students can now engage in when they meet in groups on campus.

Recommendation Four

Student organizations and clubs on campus should be encouraged to develop electronic components that better tie the remote student to campus.

Such organizations receive space on campus and some funds to carry out their activity. It should become normal practice to conduct some activities on line and to allow on line access for remote students.

Currently the remote students do not have the same methods of evaluating courses and providing feedback as the on campus students. They are provided a survey by distance education which is completely different than the one provided to the on campus students and which does not, as a result, allow comparisons with the views of on campus students. While the classes under the Sloan project are receiving a much more comprehensive survey than either group, when the Sloan effort ends there will be poorer coverage of the remote students. All remote students should receive the standard forms used for the various schools at NJIT. In addition, the remote students have an opportunity to do more on their own:

Recommendation Five:

There should be a conference for the students taking remote courses where they can privately discuss their experiences in

taking various courses and evaluate it collectively as a student group.

At many universities the students are able to conduct independent evaluations and this would be extremely easy to start via this technology. What is needed is an unbiased party to setup and conduct a private conference with the students.

This brings to mind the final, but no less major problem. Very few of the regular offices that deal with the distance students have any clear electronic address on EIES or at NJIT that is provided the students. It was only with some effort that Distance Learning has begun to recognize the need for this but even their written material sent to students does not explain how the student may send electronic mail to reach them.

The students should be able to contact such parts of NJIT as the registrar, the book store, the computer store, student services, the dean of students, the library, the tutoring center, the employment office, etc. Anywhere on campus that a student would normally be able to go to make inquiries, should have a clear electronic mail address that the students can use and expect to get answers. Given the difficulties of reaching people in these offices by phone this should be a high priority item. There should be no difference in access to any NJIT office between the on campus student and the remote student.

Recommendation Six

There should be an NJIT directory for students available over the WEB that gives the electronic mail addresses that students can use to reach any office that the student would normally have access to on campus.

Even in the CIS department, the tutoring center function for students who can walk into a graduate student's office has not yet been put on line for the benefit of remote students who need tutoring.

Providing a complete electronic campus will be critical to the long term success of this program. In line with that it should be noted that we have to make the access problem straightforward and obvious.

Recommendation Seven

We should adapt a policy and approach that all remote students must be able to access NJIT via the Internet and be able to access other WEB sites as well.

This is a small cost today relative to the fact that we already require them to have the hardware and software needed. We could even choose a provider of Internet access that we know is reliable and let students know about the specific option. The on campus student at NJIT is provided a computer. There is a view that we should provide the network access to the remote student. We could pay for the network access membership of remote students during at least their first semester as students.

While a student can access Internet from EIES once they have gotten to the EIES Virtual Classroom most of the problems have been solved. Currently we are forever dealing with too many different forms of access. Besides necessitating an every increasing modem pool and the associated costs we cannot provide one workable set of instructions to all students on how to utilize communication software and how to upload and download. The student almost expects that we must be experts in every sort of access problem they may be having. By providing a standard single access and providing it we eliminate a lot of problems that are causing many people time and effort far in excess of the typical \$15 a month per student that most Internet providers now charge.

By getting them on the WEB even before mastering on EIES we then given the immediate access, or should, to all the materials on the course. Furthermore there would be more incentive for the faculty to seek out and utilize other relevant course materials that might exist on the web.

This and other remote degree programs at NJIT have a great potential but the University as a whole must commit to giving the remote student true equality of treatment and access to the resources need to be an effective remote student.

APPENDIX: COURSE SYLLABUS

**CIS 455 Computer Systems Management
Course Syllabus
Murray Turoff**

Computer and Information Systems Department
New Jersey Institute of Technology
University Heights, Newark, NJ 07102
Tel: 201 596 3399
Network: murray@eies.njit.edu
EIES2: 103 or murray

BACKGROUND:

This course recommends CIS 350 as a prerequisite and requires junior standing. Students who are not CIS majors should have at least one introductory management course. Exceptions to this must be with the permission of the instructor. This is usually done for remote students and those having some experience working in an Information System environment. The course is intensive and taught as a senior level course. My lecture illustrations will be made available to the students on diskette.

ABSTRACT:

An overview of the organization and provision of Computer and Information resources and services within an organizational context. The course will emphasize the hardware and software planning, acquisition, justification, development, and evaluation processes that should be utilized by management. It will also discuss basic issues associated with the impact of computer systems on the user, the organization, and management.

READINGS:

The readings and lectures make up the material for the two exams that are given about a 1/3 and 3/4's through the course. The lectures provide different material and insights than those that are contained in the readings. The readings are:

Book:

Information Systems Management in Practice, Third Edition, Barbara McNurlin and Ralph Sprague, Jr., Prentice Hall, 1993. The student is responsible for chapters 1 to 16.

Articles:

The following are some classic professional articles that are also part of the required readings:

Keen, Peter, (1981), **Information Systems and Organizational Change**, Communications of the ACM, 24(1), January. This article deals with the possible conflicts that are introduced in organizations from the introduction of Information Systems.

Mowshowitz, Abbe, (1981), **On Approaches to the study of Social Issues in Computing**, Communications of the ACM, 24(3), March. This article provides a structure for understanding the other readings in this area and the underlying biases that exist.

Case Studies:

The following five Harvard case studies should be purchased from the book store. They are provided in a bound volume.

1. Quality Life of New York, 179-200.
2. Rogers Automotive Company 9-185-006.
3. PlanPower: The Financial Planning Expert System. 9-186-293.
4. IBM Computer Conferencing, Harvard Business School 9-188-039.
5. Budd Services Inc., 9-189-050

REVIEW ASSIGNMENT:

You are required to find and review (in the class conference) a PROFESSIONAL article about the Management of the **development** of Computer and Information Systems. Part of the grade for your review will be based upon how significant the article is. This review is due by the eighth meeting of the course. When you have determined what article you plan to review you should put the complete reference in the class conference along with a one paragraph statement as to why you think it is significant. This should be done by the fourth meeting of the course. This will reserve the article for you (first come, first served). No student can duplicate another student's choice. When you enter the planned article in the conference you must hand or mail me an Xerox copy of the original article. If I do not reject that choice within one week of giving me the article it is accepted for your review article.

A complete reference has the following format in the following order:

author last name, author first name, other authors, title, journal, volume, issue, month, year, pages.

Your review will be entered in a special EIES conference setup for that purpose. With your review you must include a potential exam question based upon your review. The question may relate material in the review to other things in the readings or lectures.

The review should be no more than two typed pages and focus concisely on the following points:

Introduction: Objective of the article and what is the findings or approach is based upon.

Results: What are the important observations, conclusions, findings, etc. Any important details relevant to the individual findings.

Issues: What open questions or issues are still unresolved?

Critique: How confident have you in the results of the article and why?

DUE DATE FOR ARTICLE CHOICE: By the fifth week of the course.

DUE DATE FOR ARTICLE REVIEW ENTERED: By the eighth week of the course. No credit for late reviews since they must be available to students before the exam.

The article must relate to the subject of management and not be an article that is purely about the technology.

CASE STUDY ASSIGNMENTS:

We will do a case study about every two to three weeks. You need to hand in at the beginning of the class discussion your written answers to the questions associated with the case study. This item cannot be late as the class discussion will be on the

case study. If you cannot attend class that evening then you should mail the case study to me post marked by that day or send it in with another student.

Participation in discussion and on-line will be a part of your grade. You may team up with up to two others to discuss and analyze a Case Study. In that case you will hand in a single write up with all two or three names on it. All the members of the team get the same grade. I consider it a useful beneficial experience to discuss these cases in study groups. Those of you working together on a case study may set up a private conference for that purpose.

You will find case study assignments and associated questions in our class conference. Each question answer should not take more than one double spaced page. I will not read or grade more than a one page answer to each case study question. Your hand writing has to be very legible and in ink for me to accept it over typewritten homework. Those of you for which English is not a first language should strongly consider using a grammar checker. Poor grammar will affect the grade on any formal assignment.

FIRST CASE STUDY ASSIGNMENT:

The answers to the following case study (5%) must be handed in at the beginning of the third meeting and it will be discussed in class. If you cannot attend class they must be post marked to me by that date. Obviously I cannot give credit once you have seen the discussion about the case.

Each question answer must not take more than a single page, double spaced, 12 point font. If you must hand write these they must be done in ink, in a clear handwriting.

You may choose to work in a team of up to three on a case study or individually as you see fit. If you work in a team, you hand in one paper with all members of the team named. Everyone gets the same grade.

CASE STUDIES: Quality of Life of New York

1. How would you summarize the current situation?
2. What are the key issues underlying the current situation?
3. What action should Mr. Swartz take?
4. What advice can you give Mr. Heller?
5. What advice can you give Mr. Lee?
6. What general management wisdom about Information Technology have you learned from this case?

Your answers to the above are in no more than 6 pages, one page per question.

ADVICE ON DOING A CASE STUDY

1. Read related chapters in the book. For the above case chapters 1 to 4 are relevant background.
2. First skim the case trying to determine broadly what is the case about and what types of information are you being asked to analyze.
3. Next read the case very carefully, underlining key facts as you go. Try to determine the basic problems and the key issues facing the managers involved.
4. Note the key problems on scratch paper and review the case again sorting out and noting the relevant considerations for each problem.
5. Now go back to the questions and utilize your notes and the case to try to prepare answers.

6. If you are working as part of a group make sure everyone has done the above before getting together to reach agreement on the answers to the questions. Do not divide up the questions by separate group members or you will certainly do poorly as a group.
7. In a group each of you should provide a complete set of answers as a starting point for a complete discussion. Then as a group you can discuss and weigh each point made in response to a given question.

Groups are only useful if everyone contributes and everyone's brain power is focused on all the considerations.

EXAMS:

The exams cover the readings, including the articles, the student reviews, and the lectures and lecture notes. I expect you to know terms and concepts and be able to synthesize across different concepts. The sorts of things I expect you to remember are those things you should remember if you are ever in a management position dealing with the development or use of computer and information systems. Each exam is worth 15% of the grade.

COURSE PROJECT:

There is a project rather than a final exam. I would expect a project to cover 10-15 relevant sources of literature. At least 2/3's of the references should be professional papers in journals rather than magazine articles. Some magazines occasionally have good review articles. One may also use chapters in a recent book or papers from published conference proceedings. The student is advised to learn how to use the citation index in the library. This is a way to find relevant current articles given one older classical article on the subject.

You are to choose an individual and specific area of technology that is further specified by an application area. For example: "Expert Systems in the Insurance Industry," "CD ROMS and the Publications Industry." or "Graphics in Architecture." You may also choose technology that is clearly related to management in the IS area, e.g., CASE methodology in Software Development.

To choose a topic you must put in the class conference a comment that has:

- 1) Title and Abstract
- 2) Top level outline for Table of contents of your report
- 3) Three literature references to go with the topic.

The first one to choose a topic by **supplying** the above information has that topic and no other student may take it. Your report is to cover in equal depth **two** aspects of this topic. Topics should be chosen by the tenth week of the course. These are:

- 1) A description of the functionality of the technology in the application area that is written for managers and executives, not technical individuals. This part is intended to supply managers with an understanding of what the technology can do in the application area they are concerned with. This should not focus on just what is in the market right now, but what the technology will be like in the next five years with respect to performance and cost. It should make clear what technical issues the manager has to understand to evaluate the application of the technology.

- 2) The implications for management of this technology. What should be the approach of management to the introduction and utilization of this technology. What management policies, practices, and decisions will be changed or impacted by this technology within the specific applications area? Will jobs change, will the handling of information change, will profit potential change, etc.? What are the potential dangers or possible disadvantages of the technology? (Reports that follow Mowshowitz's Technician viewpoint will not be graded high.)

This paper will be done as a professional paper. It can be anywhere from 15 to 30 double spaced typed pages for a one person report. At least one half of the references should be professional journals. The rest can be from relevant technical magazines such as Byte. References should be noted directly in the text in the form (author, year). In other words, where you are directly taking information from an article it should be noted in that place in the article. Direct quotations should be marked as direct quotes. Plagiarism would be an automatic F in the course. The back of the paper should contain a complete list of references with all the details on the reference (title, authors, year, journal, volume, issue, pages).

This paper will be due on the last meeting day of classes. Not the day we normally would have a final.

You will be required to enter a one to two page executive summary on EIES2 that will also add as an addition your reference list. This is for the benefit of the other students who might someday need to learn about the topic. Considering the executive summary I will select some of you to make presentations on your project the last two meetings of the class (one of which is our final's meeting).

PARTICIPATION:

Your participation in class discussion and/or discussions in the on-line conference can have the effect of moving your final grade a half grade point in either direction if it is way below or above average. (e.g., B to B+ for outstanding discussion or B to C+ for poor participation). In addition 10% of the grade is based upon your participation in the discussing the questions raised by the instructor on line. Participation is not based upon quantity except in the negative sense (e. g., none is of course poor), but upon quality. Participation can be based upon asking good questions as well as having good insights. Participation considers your response to other students in the class and not just to items solicited by the instructor. It may also be based upon describing relative experiences you have had in your own work or in providing references you have run across that might be useful to other class members.

REMOTE STUDENTS:

If the course is being filmed in the current semester remote students will receive the lectures one week late so they will have one additional week to hand in the design assignments. On-line assignments will be due the same time for all students and mail in assignments must be post marked on the due date. If the remote students are receiving the whole set of tapes at once, their due dates are then the same for all the assignments.

Tapes which discuss the case studies will be mailed after the due date and online discussions of the case studies will not take place till after they are due.

ELECTRONIC CONFERENCING:

We will be using the EIES 2 conferencing system (Electronic Information Exchange System) for our class conference. There will be a class conference for discussion and keeping track of what is taking place. There will be a number of small discussion assignments in this conference. There will also be a separate conference for putting in your reviews and executive summaries of your final project. Longer items of this type are put in a separate conference so they do not break up the discussion threads in the main conference.

You need a personal computer with a modem and a communications package. If you do not have access to one at home or work, you may use the terminals at NJIT in Colton Hall. You should get familiar with EIES 2 as soon as possible and try to check in at least twice a week. If you let weeks go by without checking in you will find it very difficult to keep up with the material that has been entered. You may phone a local Newark number, utilize INTERNET (using the TELNET functionality) or AUTONET (a commercial service) from anywhere in the country. Any University or college location that has access to INTERNET can also be used to reach the EIES 2 system at NJIT.

If you do not have access to INTERNET or long distance lines from your company, you may contact the conferencing center (ask for the "accounts monitor," or message her on EIES as 102, or phone her on 201 596 EIES) to arrange to utilize a commercial data network and to be charged for it). Autonet is available and is low cost during nighttime and evenings.

Conference 1000 is PRACTICE and you may use that to practice being used to the system and to try such things as uploading and downloading. I will put a practice activity in conference 1000 so you can learn activities there. You should check into this conference at least twice a week. If you do not have access to a PC and modem at work or home, then you can use the laboratories and terminals at NJIT. User manuals are available from the computer store at NJIT for \$4. Besides the private class conference, there are public conferences (e.g., the student PUB), entry to the World Wide Web on Internet, private messaging capability and a directory of members.

If you are having any trouble using EIES2 you can message HELP on the system or if you cannot get into the system phone 201 596 3437 (EIES) for getting verbal help. At the beginning of the semester there are training sessions in the COLLAB (in the CIS Department) and the laboratory has experienced student monitors to aid students in learning EIES.

You may send me private mail using the ID: **103** or **Murray**. However, questions that would be interesting to other students should be entered in the conference and not sent as a private message. Only send me network mail if for some reason you cannot get into EIES and need to reach me. If you are having trouble reaching EIES you may use my other mail address: murray@eies.njit.edu to reach me. Remote students, in an emergency can phone me at home, message me for the number. My office hours at NJIT will be announced at the beginning of the semester.

The careful use of keys on EIES will allow you to find things later. You should all try to make a good choice of indexing keys when you write a comment in our conference. I suggest that you explore a public conference by using the Find command and the resulting key word list.

I do feel that the use of a shared communication space (such as EIES 2) allows us explore, share, and learn a great deal more than would otherwise be possible. I am on

EIES at least every other day and would recommend that you plan on using it at least twice a week. There is a lot of material to cover in one semester and even so we can not do full justice to the subject. The more you, as a class, exchange comments on what you are learning and your experiences, the more we can all learn and enjoy the course.

You should fill in your DIRECTORY on EIES2 so that if I need to reach you by phone or mail I will have a place to find your phone or address.

The class conference is the place to ask any questions you have on the readings or any points you want me to elaborate on. My lectures augment the readings and are different from the readings. Unless you ask questions I can only assume you understood the readings.

POLICIES:

All assignments that are mailed to me (by remote students or students that cannot make class) should be mailed to my home address:

Murray Turoff
19 Meadowbrook Rd
Randolph, NJ, 07869

Do not send or mail material in any way that I am forced to sign for it, as this would delay its delivery and cause me considerable inconvenience and lost time.

Travel or work commitments are not acceptable excuses for handing in assignments late. Neither are such things as lack of backup to a crashed disk. Late assignments will result in lower grades. If you have travel commitments you have to do your assignment ahead. If you have to miss class you should make arrangements with a fellow student to use his or her notes.

The approximate weight of each assignment is: project 25%, Cases 25% (5% for each case), exams 30%, review 10%, and on-line assignments 15%.

This is a highly interesting topic and it can be a fun course if everyone does their part. I have been active in this field since 1958 and have had practical experience as a developer, manager, and consultant. I hope I can guide you to a better understanding of this topic.