

INSY 560: Advanced Software Engineering

Computer Science & Information Systems Department
Andrews University School of Business
Berrien Springs, Michigan 49104

Fall 1997 (Singapore)

Instructor: Mr. Daniel E. Turk

Office:

Since the lectures for this course are taught during a two-week intensive visit in Singapore, no normal office is available. However, the local Informatics office can provide assistance, or you may send e-mail directly to me, or call or FAX using the phone numbers listed below. Note that my residence is currently in Atlanta, Georgia, not in Berrien Springs, Michigan, so messages left at the AU CSIS office will take some time to be relayed to me. E-mail is the recommended contact method.

Office Hours: by e-mail, phone, and arrangement during two weeks of lectures from Aug 24 through Sep 7.

Phone Numbers:

AU CSIS Office: (616) 471-3516

AU SBA FAX: (616) 471-6158

Atlanta residence: (770) 984-2359

before 9:00 p.m. Eastern U.S.A. time, and not on Friday evenings or Saturdays

Atlanta FAX (GSU CIS department): (404) 651-3842

Internet E-Mail: turk@andrews.edu

WWW: <http://www.andrews.edu/~turk>

Class Dates:

Term: 1997 Aug 11 – Nov 23

Lectures: Aug 24-Sep 4 (Sun 9am-noon & 1-3pm, and M-Th 6-9pm)

Tests: Test 1, Sun, Aug 31, 9-noon; Test 2, Sun, Sep 7, 9-noon)

This Syllabus Provides a General Plan for the Course;
Deviations May Be Necessary.

Course Description and Prerequisites:

"An advanced study of applied software product development issues. Specific topics include requirements analysis, system and software design methodologies, software implementation and testing, software reuse, language, tool, and hardware selection, software project planning models (e.g., COCOMO, etc.), software economics, productivity management, risk management, statistical process evaluation and control, etc. This course builds upon INSY 460 and other classes taken within the program. Prerequisites: INSY 460, MATH 182, STAT 285."

— 1996-97 Andrews University School of Business Bulletin

This course is based on the textbook, *A Discipline for Software Engineering*, by Watts Humphrey. The whole purpose of the course is for the student to learn about and develop a solid set of software engineering skills which are scalable to large software development projects. These skills are learned by practicing on a set of small software development projects that cumulatively build on each other throughout the course. Through this approach, the successful student's analysis, design, coding, testing, maintenance, and project planning skills will improve.

Textbooks and Other Required Reading:

Humphrey, Watts S. (1995). *A Discipline for Software Engineering*. New York: Addison Wesley. ISBN 0-201-54610-8.

Other Required Resources:

MS-Word 6.0 for Windows or later. Word 97 preferred. (Must purchase mail-order or at a local distributor.)

MS-Excel 5.0 for Windows or later. Excel 97 preferred. (Must purchase mail-order or at a local distributor.)

Pascal, Object Pascal, C, C++, etc. compiler. C or C++ preferred. (The specific language is not especially important, but *you must already know it well*. You may not use a language that you are just learning and that you do not have good proficiency with. If you wish to use a language other than one of those listed above, please talk with me beforehand.)

Adobe Acrobat Reader 2.0 or later. Version 3.0 is recommended (Free from www.adobe.com.)

Web browser, such as Netscape Navigator 3.0 or later, or equivalent. (Netscape Navigator is free to students from www.netscape.com.)

ZIP and UNZIP. Available on web at www.cdrom.com/pub/infozip/FAQ.html and many

other sites.

UUENCODE and UUDECODE. Available on web at helpdesk.uvic.ca/how-to/support/msdos/uu.html and many other sites.

Internet access, including e-mail and WWW capabilities.

Grade Breakdown & Weights:

Breakdown		Weights:	
95	A	Homework	45%
90	A-	Tests	45%
87	B+	Misc	10%
83	B		
80	B-		
77	C+		
73	C		
70	C-		
60	D		

NOTE: This breakdown indicates lower limits of the letter grade you will receive if you earn at least the score given in the chart.

Teacher-Student Communications (Internet E-Mail and the WWW):

The best way to contact me is via Internet e-mail. Send e-mail to the address listed on the first page of this syllabus and I will probably respond within 24 hours of receiving your note. (Mostly likely within just a few hours — I check mail several times a day almost every day of the week!) I assume that you have an Internet e-mail address and will be using it regularly throughout this class. (If you do not have an account, apply for one right away!) I will expect to be able to send e-mail to each of you and to get prompt replies.

If there is an emergency which necessitates your speaking with me more quickly than what sending e-mail might allow, call one of the phone numbers listed on the first page of the syllabus.

I will use e-mail and the WWW to post notices, schedule changes, etc. Numerous handouts, course objectives, and assignments are distributed in electronic form (non-paper) through e-mail and Web pages which I continually update throughout the quarter. You will want to visit my INSY 560 Web site frequently.

In order to read and/or print much of what is posted on my Web site, you will need the Adobe Acrobat Reader installed to work with the Web browser on your local machine.

The reader is freely available, and may be downloaded from www.adobe.com.

Participation:

While participation is not directly taken into account when determining course grades, it is expected both during lecture visits and via e-mail. This course may involve new ideas and almost certainly requires learning new skills and behaviors with respect to your software development habits. Thus participation in class is anticipated to be beneficial and full involvement is expected.

Tests:

There will be two tests, given on the 2nd and 3rd Sunday mornings of the 2-week intensive. The 2nd test will be given the day that the INSY 562 presentations are scheduled, in order to give you a little time to study between Wednesday when we finish covering the material and when you have to take the test. In order to accommodate this, half of the INSY 562 presentations will be given on Thursday and half on the final Sunday, after the test is taken. These tests will not be “comprehensive” as such, although some concepts may be cumulative, and in that sense the tests may have some comprehensive nature to them.

Homework:

General

The homework for this course involves working seven regular homework assignments (plus one pre-assignment which must be completed before the two weeks of lectures). The details of these assignments are provided in the textbook and in postings on my WWW pages. These will be completed and submitted on approximately a bi-weekly basis. There are several reasons for specific deadlines like this throughout the term:

1. The assignments build on each other throughout the quarter, and the teacher needs to provide feedback after each submission.
2. If the teacher is to gain any semblance of efficiency in grading, everyone’s assignments must be graded at the same time.

Given that the course is taught as a remote intensive with an initial two-week on-site visit by the professor, it is imperative that the student carefully plan and manage his/her time and keep on track with the assignments. This is also especially important since the assignments all build on each other, using what was learned on earlier assignments in order to complete later ones. You do not have the luxury of skipping an assignment and going on to a later one. You must do each one in turn. You must keep up.

Because of this progressive nature, with assignments building throughout the quarter, and because of the amount of grading time, coordination, and feedback necessary for each assignment, **LATE WORK WILL NOT BE ACCEPTED**. If for some reason you are not able to complete a given assignment and submit it on time, you must still complete it in

order to be able to complete the succeeding assignment. Plan your time wisely and get work turned in on schedule.

The following table summarizes the quarter's homework assignments.

INSY 560 Homework Assignments		
Assignment	Program	Report
HW 0	Pre-Assignment	
HW 1	1A (linked list mean, st_dev)	
HW 2	2A (program LOC)	R1 (LOC counting std), R2 (coding std)
HW 3	3A (program + object/function LOC)	R3 (defect analysis report)
HW 4	4A (linear regression parameters)	
HW 5	5A (numerical integration)	
HW 6	6A (prediction interval)	R4 (mid-term report)
HW 7	10A (3-parameter regression)	R5 (final report)

Due dates are posted on the WWW in the Detailed Schedule (sched.pdf).

Submission requirements are listed below.

Submission Requirements

All assignments will be submitted via e-mail. The general requirements for each assignment are spelled out in the textbook and in the associated assignment kits (except for HW 0 which is described in the Homework Assignments Due Dates detailed schedule — sched.pdf on the Web), but in general you will submit a program (source, executable, and data files) and supporting documents (MS Word/Excel forms/files specified in the assignment kits). An electronic copy of the assignment kits is available at my Web site under the handouts section (Hum_Sup.Zip). Included in this archive is the *forms.doc* (MS Word) file which contains the numerous forms you will fill out and submit to me for each assignment.

You MUST have access to MS-Word and MS-Excel. ALL SUBMISSIONS (other than programs) MUST BE SUBMITTED IN WORD/EXCEL FORMAT. DO NOT ATTEMPT TO CREATE FORMS IN WORDPERFECT OR SOME OTHER WORD PROCESSOR AND THEN CONVERT THEM TO WORD. IT DOES NOT WORK SMOOTHLY AND YOU WILL EARN ZERO CREDIT IF YOU DO NOT USE THE SUPPLIED FORMS.

For each homework assignment you will be required to follow the general procedure listed below:

- Develop, test, and track information on the program as specified, being sure to name your files as specified below.
- Record information in the required MS-Word/Excel forms.
- Organize these forms within a single *forms.doc* file (and StuN.XlIs) *in the sequence*

specified in the corresponding assignment kit.

- Create any reports, etc., as specified or necessary for the assignment, and include them in the *forms.doc* file.
- Archive and compress the program and Word/Excel files into a single ZIP file.
- Convert this binary ZIP file to an ASCII version (using UUEncode) which can be sent via regular e-mail.
- E-mail this single ASCII file to me with an appropriate subject line.

The details are outlined below:

- You may use an object-oriented language, or a traditional procedural language. In any event, you must use the same language for all assignments. You may not start with one language and then switch to a different one later on.
- Do NOT use a language that you do not know WELL. Do NOT use this course to LEARN a language. Use a language you know very well and with which you have a good bit of experience.
- All programs must be modular, written with multiple functions/methods that implement the necessary program features, with parameters used to communicate between functions (in general NO global variables). Source code must have a liberal amount of whitespace and use good indenting and commenting standards. This is a MINIMUM for good program style.
- Source files should be readable in a simple text editor. Thus, make sure your indentation consistently uses either tabs OR spaces, but not both. If you use both then you risk my not being able to view it in the same nice readable format you create it in, since some programming editors display tabs differently than others do. This would result in reduced scores on your HW.
- Be sure to verify BY HAND that your programs do what they are supposed to do. Do not assume that the output is correct. VERIFY it before you submit it.
- Spell-check and grammar check all documents submitted. Likewise, check to make sure that all forms/documents have nice visual layouts. (This applies primarily to documents you have to create from scratch. The documents in the *forms.doc* file should not be changed. You should simply fill them in with necessary data.)
- For a given assignment, do not submit anything until you submit everything. (See instructions in appendix D of the textbook.)
- Do not submit anything until you are totally finished and you are sure it is correct and complete. (See instructions in appendix D of the textbook.)
- Type all your documents in MS-Word (or Excel where required). Do NOT convert them from another format. This has been attempted in the past, and the conversions do NOT work smoothly. Create the originals in Word.
- Make sure your forms within the *forms.doc* file are in the correct sequence/order as specified in the corresponding assignment kit.
- Send only files that are required for the given assignment. (In other words, do not send files for previous assignments, extra Excel or Word files, etc., unless you are

specifically required to do so.)

- Use MS-DOS 8.3 file naming conventions so I can read these files on whatever system I happen to be using. I do not always use systems that run Windows95, and thus you may not use longer file names.
- Archive and compress all files, using the naming conventions specified here: The ZIP file should be called LLFFMMDD.ZIP, where LL is the 1st two letters of your last name, FF is the 1st two letters of your first name, and MMDD is the month number and day number the assignment is due. Months 1-9 should be designated with an initial 0. For instance, if I sent HW 1 that is due on Sep 7 (9/7), the ZIP file would be called TUDA0907.ZIP. If I sent HW 7 that is due on Nov 23, it would be called TUDA1123.ZIP.
- There should be no directory structure included within the ZIP file – just the files themselves.
- Convert the binary ZIP file to an ASCII version by using UUENCODE. This is the only file you should submit to me. UUENCODE is freely available on the Internet.
- Use an appropriate comment line for the e-mail submission: For example, “Dan Turk’s INSY 560 HW 1 submission” would be a good format to follow.
- E-mail me a single, UUENCODED ZIP file which contains your program, your forms.doc & stuN.xls files, and any other required files. This file should be INCLUDED in the e-mail message, not ATTACHED as some mailers allow you to do. Directly include the ASCII UUENCODED file.

Thus, all I should have to do to access your submissions is to save your e-mail, uuencode the saved file, and download the resulting ZIP file to my PC where I will UNZIP it and read the enclosed WORD files and look at and run the enclosed programs.

Failure to follow these submission guidelines will impact on your grade for the course.

Level of Quality Expected

All work turned in for a grade should be done to the same level of quality as would be expected in a professional work environment. This means that all submissions should be neatly typed, use proper grammar and punctuation, have correct spelling, follow standard writing style guidelines, give credit when material is quoted, used, and/or referenced, etc. (See more detailed explanations below under *Individual Work* and *Professional Standards of Scholarship*.)

Individual Work:

There is always a balance which must be achieved between doing work solely on your own and drawing from other sources¹. In fact, one good way to make progress is to build

¹ Compare what is said here with what is said in the section entitled *Professional Standards of*

on what has already been done by others. Good scholarship even *requires* that we, in the process of developing our own ideas, reference the works of others that have inspired, guided, and influenced us. However, others' material must be used and referenced appropriately; thus these comments about individual work and giving credit where it is due.

All work turned in for credit must be done *solely by the person whose name is on it and is receiving a grade for it*. Two people, even if they work together to help each other understand the homework, should produce unique work -- you are unique individuals. Make sure the assignments you turn in are YOUR unique work. Source code sharing/copying is NOT appropriate. The code you turn in is to be your own creation not partly or totally gotten from others.

Even though you will be turning in only work that you have done yourself, it is recognized that you will need, in fact be required, to draw on previous work done by others, and, in fact, to interact significantly with other class members. Thus you should give appropriate credit when this is the case². Your textbook and assignments refer to appropriate ways to work together and how to document that fact. However, *in all cases you will be required to have completed a first pass on each assignment / task on your own before conferring with you classmates*. Conferring with others should be used to get *feedback on what you have already done*, not to help you do your original work. The work you turn in should clearly indicate what you did first, what feedback you got, and what the final result was after you did more work on each assignment.

Answers should be in *your own words* - NOT your friend's and NOT just direct quotes from the textbook! Reword the answers so I know that you know what you are talking about! I am not interested in your just copying from someone else.....!

Professional Standards of Scholarship:

Professional standards of scholarship require that any time an individual relies on another's work, proper credit must be given. This means that any time one directly uses textual material that it must be placed within quotes and referenced properly; other non-textual material must be shown with proper credit given citing the original source of the work. When material is not used in exact form (paraphrased, major ideas relied on or referred to, etc.) it should still be given credit as well, although it is not put within quotes. *Always give credit to ideas or materials that are not yours*³. If in doubt, give credit.

Scholarship.

² For details see section entitled *Professional Standards of Scholarship*.

³ This includes software source code as well. Always give credit when you rely on someone else's ideas, examples, algorithms, source code, etc.

Violations of these standards are *highly* disapproved of, and appropriate academic action will be taken depending on the situation. Be professional, give credit where it is due, turn in work that is your own, and you will be fine.

IF YOU ARE UNCERTAIN ABOUT HOW TO DEAL WITH THESE ISSUES,
PLEASE TALK WITH ME. I AM HERE TO HELP YOU LEARN AND TO HELP
YOU WHEN YOU ARE UNCERTAIN ABOUT WHAT TO DO. DO NOT HESITATE
TO ASK QUESTIONS!

Besides expecting professional standards of scholarship, generally accepted U.S. standards for written work will be applied to documents turned in for this course. This means that grammar, punctuation, spelling, and citation of references should follow standard guidelines. APA (American Psychological Association) or another common standard is acceptable for work submitted for this course. Be consistent; be neat; be professional.

You are receiving a degree from an American university, which you and the University want to be well-respected. Thus you will be held to relevant American academic standards.

Overview Schedule:

INSY 560 Overview Schedule				
Fall 1997 (Singapore)				
See schedule on WWW for details.				
Day	Date	Lecture Topic	Read	Due
M	Aug 11	Term begins	Read as much of the textbook before Aug 24 as possible.	
Su	17			HW 0
Su-Th	Aug 24-28	Intro and first half of book	H 0-7, Appendices C & D	
Su	31	Test 1 (9am - noon) Continuation of textbook Discussion of first program and forms.doc	H 8-10, Appendices A & B	HW 1 first pass program and forms
M-W	Sep 1-3	Second half of textbook	H 12-14	
Th	4	INSY 562 Project presentations		
Su	7	INSY 560 Test 2 (9am – noon) INSY 562 Project presentations (1-3pm)		
	Sep 18- Nov 23	Complete all HW assignments		HW 1-7
	23	Term ends		
	30			
	Dec 7	Grades due somewhere around here		
	14			
<p><i>Readings:</i> H = Chapter from Humphrey text. Readings should be done before class on the dates shown.</p> <p><i>Due:</i> All assignments (except for HW 0) are fully described in the Humphrey text, and will be discussed in class and via e-mail. See summary of homework assignments.</p> <p>The course syllabus provides a general plan for the course. Deviations may be necessary.</p>				