

CSE 460/598

Software Analysis and Design Fall 2007

General: Bldg/Room: BYAC-210 (ASU, Tempe)
Lecture hours: 4:40 – 5:55, Mon & Wed
Course portal: <http://my.asu.edu> (CSE 460/598, SLN: 75302, 85350, Online)

Textbooks: **Required:**

- *Object Oriented Analysis and Design (OOAD)*, 3rd Ed., G. Booch, et al, Addison Wesley, 2007.
- *Software Architecture in Practice (SAP)*, Second Ed. L. Bass, P. Clements, R. Kazman, AW, 2003.

References:

- *Object-Oriented Modeling and Design with UML (OOMD)*: Michael Blaha, International Edition, Prentice Hall, 2004.
- *UML Standards (UMLS)*, <http://www.uml.org/>.
- *Software Architecture in Practice (SAP97)*, L. Bass, P. Clements, R. Kazman, AW, 1998.
- *Software Engineering: A Practitioner's Approach (SEPA)*, 5th or 6th Ed., R.S. Pressman, McGraw Hill, 2000.
- *Design Patterns: Elements of Reusable Object-Oriented Software (DP)*, E. Gamma, R. Helm, R. Johnson, J. Vlissides, Addison-Wesley, 1995.
- *Object Solutions: Managing the Object Oriented Project*, G. Booch, AW, 1996.

Instructor: Hessam S. Sarjoughian
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Office hours: Mon. & Wed. 1:00 - 2:15 pm; and by appointment

Teaching Asst.: TBD
Email: TBD
Office hours: TBD

Lab. Facility: Brickyard building: 214
Days/Hours: 24 hours, 7 days a week. (Access right is required to use the lab.)

Course Description (CSE/ASU catalog): Requirements analysis and design; architecture and patterns; representations of software; formal methods; component-based development; Prerequisite: CSE 360 or equivalent.

Course assignments and exam: Four to six homework assignments (weighted equally) will be assigned. For each homework assignment, selected problems will be randomly graded. Each homework assignment generally is due 1 to 2 weeks after its assigned due date. There also will be in-class exercises. The lowest homework assignment will not be included in the course final grade. There will be two quizzes, one midterm exam, and one comprehensive final exam. Quizzes are similar to the midterm exam.

Term paper (graduate students only): Each graduate student will research and prepare a term paper discussing a specific topic related to the course materials. The theme of the term paper will be available

on the course portal. A 600 to 800 word Extended Abstract is required. The length of the Final Term Paper should be between 2000 to 2500 words (for details refer to the course webpage). The Extended Abstract and Term Paper must be submitted in hardcopy and softcopy format. On-campus students submit the hardcopies of extended abstracts and term papers in class. Online students must submit their work to CPD.

Participation: In-class exercises, MY.ASU discussion board, and classroom Q/A.

Homework: Each homework grade is reduced by 20% for each day past due date. Late homework assignment grade is zero as soon as the solution is made available in class or posted on MyASU.

Attendance policy: Participation is an integral part of the course and attendance will be monitored randomly and evaluated for on-campus students. Online students activities such as participation in the Discussion Board will be used toward the Bonus points.

Online students:

Homework, Extended Abstract, and Final Term Paper must be submitted to CPD. For assurance, it is recommended to also submit to the Digital DropBox on MyASU.

On-Campus students:

Homework assignments (and Extended Abstract and Final Term Paper) must be turned in **hardcopy form** at the start of the class on the assigned due date. Examinations **may not be taken separately** except in special situations with prior arrangement at least two business days in advance.

Software: Rational Rose software will be used. See below for more information.

Grading scheme and important dates:

	% of total grade (Under. Students)	% of total grade (Grad. Students)	Date/Time	Location
Homework	25%	20%	start of class	BYAC-210
Quizzes	25%	20%	TBD	BYAC-210
Midterm Exam[§]	25%	25%	10/04/07	BYAC-210
Participation (Bonus)	5%	5%	NA	BYAC-210
Term Paper^{§§}	NA	10%	Extended Abstract: 09/27/07 Final Term Paper: 11/27/07	BYAC-210
Final Exam^{§§}	25%	25%	12/11/07 04:40 – 6:30 pm	BYAC-210
Total Grade	105%	105%	NA	NA

§ Tentative

§§ Date is firm

Letter Grade: Course grade is based on 10-point scale (it may be relaxed at the discretion of the instructor). **Students are responsible for all materials covered and discussed in class, posted on Blackboard, or other correspondences.**

% total score	≥97	≥94	≥90	≥87	≥84	≥80	≥75	≥70	≥60	<60
Letter grade	A+	A	A-	B+	B	B-	C+	C	D	E
Points for GPA	4.33	4.00	3.67	3.33	3.00	2.67	2.33	2.00	1.00	0.00

Withdrawals: In-Person withdrawal deadline is **October 26th**; Interactive SunDial withdrawal deadline is **October 28th**; complete withdrawal deadline is **December 4th**. Ceasing attendance does not automatically drop you from the course. **IF YOU ARE STILL ON THE CLASS ROLL AT THE END OF THE SEMESTER, YOU WILL RECEIVE 0's FOR ANY WORK NOT COMPLETED AND WILL BE GRADED ACCORDINGLY.**

Academic Integrity and Ethics: The University's Code of Academic Integrity (<http://www.asu.edu/studentlife/judicial/integrity.html> and <http://www.asu.edu/studentlife/judicial>) states that students shall not “**represent the work of others as their own.**” The Computer Science and Engineering department requires all students to adhere to ASU's policy on Academic Honesty. This policy will be applied to all work submitted for grade, including term paper, exams, and homework assignments. The minimum penalty for submitting work that is not your own is an **E** grade. Note: You are encouraged to discuss class assignments with your instructor, teaching assistant, and fellow students. However, any work submitted as part of course work must be your own work. I.e., final work submitted by student must represent his/her own individual efforts unless stated otherwise by the instructor. Fulton School of Engineering policy states that any act of cheating will result in receiving an **XE** for the course indicating failure due to disciplinary action.

Course Topics*

Part I: Object-Oriented and Structured Analysis and Design [~14 lectures]

1. Introduction [Ch. 1, OOAD, 1 lec.]
 - Course description
 - Software complexity
2. Object Modeling Foundations [Ch. 2, OOAD, 3 lec.]
 - Primary elements of the Object Model
 - Complex elements of the Object Model
 - Eclipse Modeling Framework
3. Objects and Classes [Ch. 3, OOAD; OOMD, UMLS, 3 lec.]
 - Fundamental concepts and life-cycle
 - Basic structural and behavioral modeling in UML
 - Classes and objects in Java programming language
4. Classification [Ch. 4, OOAD, 1.5 lec.]
 - Use-cases, Classes, Responsibilities, Collaborators
 - Basic behavioral modeling in UML
5. Analysis and Design [Ch. 5, OOAD; OOMD, UMLS, 4 lec.]
 - Advanced structural modeling in UML
 - Advanced behavioral modeling in UML
6. Micro and Marco Development Processes [Ch. 6, OOAD, 0.5 lec.]
7. Structured Analysis and Design [SEPA, 1 lec.]

Part II: Software Architecture Specification [~12 lectures]

8. Architecture Business Cycle [Ch. 1, SAP, 1 lec.]
 - Background and basic concepts
9. Elements of Software Architecture [Ch. 2 & 3 , SAP, 1.5 lec.]
 - Architectural styles, reference models, reference architectures
 - Architectural structures
 - Importance of software architecture
10. Software/System Applications [Ch. 3, SAP, 1.5 lec.]
 - Software/system structures
11. Understanding Quality Attributes [Ch. 4, SAP, 2 lec.]
 - Functional and non-functional quality attributes
 - A taxonomy of non-functional quality attributes
 - Business quality attributes
12. Software Quality Attributes [Ch. 5, SAP, 2 lec.]

- A taxonomy of design decisions
 - Architectural patterns and strategies
13. Designing Software Architecture [Ch. 7, SAP, 3 lec.]
- Software lifecycle and architecture
 - Architecture Design
14. Design Patterns [DP and papers, 1 lec.]

* Course topics and time allocated to each topic are subject to change.

Software tools

On-campus students:

Email Mr. Woodland (woodland@asu.edu) the following information:

- The name of your computer: To get this, right click on MY Computer (either on the desktop or in the start menu). Go to Properties. Click on Computer Name tab on the System Properties Menu. The Computer Name will be displayed.
- The Physical Address of the computer: The easiest way to get this is to open a cmd window. (Windows Key + R) Type cmd in the Open: box. When the C:\Windows\system32\cmd.exe window opens, type ipconfig -all at the command prompt. The Physical Address will be displayed.

You will receive license key by email. Save the license keys on your computer. Go to the Computer Help Desk during posted working hours and get a copy of the Rational CD's and instructions for installing the product(s) you desire.

Online students:

Refer to [ST: Software Analysis and Design - Fall, 2007](#)

http://cpd.asu.edu/cpdweb/courses/course_index.cfm?page=course_info&c=742&source=c&term=20077