

## COURSE SYLLABUS

### CIS 476/566 – Software Architecture and Design patterns

Fall 2009

#### Course Description

A Design Pattern is a catalogued solution that has been applied and tested in multiple situations to produce well-designed reusable object-oriented software. Designing with reusability is an art, typically acquired after many years of software development, refining and iterating over designed software modules. In this course, each pattern session will start with theoretical understanding followed by practical use. The design patterns will be described using Intent, Motivation, Sample Code, Applicability, Structure, Consequences and its Known Uses. The students will also test their understanding by completing a practical assignment for few very popular design patterns.

<u>Prerequisite:</u>	CIS 200, CIS 350, CIS 375 Knowledge of C++ and OOAD
<u>Class Timing:</u>	6:10PM – 9:00PM Tuesday
<u>Location:</u>	SLRC 1010
<u>Instructor:</u>	Dr. Brahim Medjahed
<u>Office:</u>	CIS 242
<u>Office Hours:</u>	1:00PM – 4:00PM Monday Or By appointment
<u>Email:</u>	<a href="mailto:brahim@umich.edu">brahim@umich.edu</a>
<u>Office Phone:</u>	(313) 583-6449
<u>Course Web Page:</u>	<a href="http://vlt.engin.umd.umich.edu">http://vlt.engin.umd.umich.edu</a>

#### Text Book:

- **Design Patterns: Elements of Reusable Object-Oriented Software, Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides Addison-Wesley,**

#### Reference books and Recommended Reading:

- **Object-Oriented Design with Applications (Second Edition) by Grady Booch**
- **UML Distilled – Third Edition by Martine Fowler, Addison Wesley**
- **Pattern-Oriented Software Architecture: A System of Pattern by Frank Buschmann, Regine Meunier, Hans Rohnert, Peter Sommerlad, Michael Stal, John Wiley & Sons; 1996.**

#### Course Contents

- Introduction to Patterns and UML
- Software Design Patterns From GoF
- Creational Patterns
- Structural Patterns
- Behavioral Patterns
- Software Architectural Patterns
- Layer, Pipe and Filters and Black Board
- Broker
- Reflection and Microkernel

## **Course Policy**

- Lecture notes and announcements will be posted on VLT. Please make sure you have a valid UMD email address in your VLT profile.
- All students must respect the *statement on academic conduct* (please, see Section 9).
- Please read you UMD email regularly for announcements.
- You are expected to return your assignments at the due date (beginning of the lecture).
- Late assignments will be penalized 10% off for each late day.
- If there are mistakes in grading your homework assignment, project, or exam, please contact me within a week after the return of your work. The entire work will be graded again and the new grade will replace the original one, whether the new grade is higher or lower than the original grade.
- All assignments must be done using Enterprise Architect (EA). EA 6.5 is installed in ALL computers CIS 117 and a couple of computers in CIS 139. You can also install the 30-days trial version in your computer.

## **Classroom hours distribution**

Lecture Session-I	6:10PM – 7:15PM
Break	7:15PM – 7:25PM
Lecture Session-II	7:25PM – 9:00PM
Questions	Anytime

## **Point Distribution**

1. Assignment 1	10%
2. Assignment 2	10%
3. Assignment 3	15%
4. Assignment 4	15%
5. Midterm Exam	25%
6. Final Exam	25%
Total	100%

NOTE: Graduate Students will have extra questions in assignments 3 and 4.

## **Schedule**

	Posted	Due
Assignment 1	09/29/2009	10/13/2009
Assignment 2	10/13/2009	10/27/2009
Assignment 3	11/03/2009	11/24/2009
Assignment 4	11/24/2009	12/15/2009
Midterm		10/27/2009 6:10pm – 9pm
Final		12/22/2009 6:30pm – 9:30pm

### **Grading**

• $\geq 92$	A+
• $< 92$ and $\geq 87$	A
• $< 87$ and $\geq 82$	A-
• $< 82$ and $\geq 78$	B+
• $< 78$ and $\geq 74$	B
• $< 74$ and $\geq 70$	B-
• $< 70$ and $\geq 65$	C+
• $< 65$ and $\geq 60$	C
• $< 60$ and $\geq 55$	C-
• $< 55$ and $\geq 50$	D+
• $< 50$ and $\geq 45$	D
• $< 45$ and $\geq 40$	D-

### **Learning Outcomes**

- Knowledge of UML and reusable objects
- Ability to design and apply existing software patterns
- Ability to analyze software problem and apply architectural patterns
- Ability to use the software design tool in an integrated environment

### **Disability Resource Service:**

The university will make reasonable accommodations for person with documented disabilities. Students need to register with Disability Resource Service every semester they are taking classes. DRS is located in counseling and Support Services, University Center 2157. To be assured of having services when they are needed during current term, students should register no later than three weeks after the first day of the classes. Contact Denis Underwood, Disability Coordinator; University of Michigan – Dearborn; (313)593-5430.

### **Statement on Academic conduct:**

The University of Michigan- Dearborn values academic honesty and integrity. Each student has a responsibility to understand, accept, and comply with the university's standards of academic conduct as set forth by the Code of Academic Conducts, as well as policies established by the schools and colleges. Cheating, collusion, misconduct, fabrication, and plagiarism are considered serious offences. Violations will not be tolerated and may result in penalties up to and including expulsion from the University.