BOSTON UNIVERSITY
Metropolitan College
MET CS665 Design Patterns and Component Software

Dr. V.Shtern (Fall 2011)

Course Syllabus

1. Course Objectives

Welcome to MET CS665 Design Patterns and Component Software. This course is designed for students with Java background. The course objective is to familiarize the student with techniques for designing reusable combinations of Java classes and organizing their cooperation to produce modular and maintainable Java programs.

Upon completion of the course, the student will be able to understand most important design patterns and apply object-oriented techniques for designing reusable, maintainable and modifiable software.

2. Course Prerequisites

As it is common for any college course, you have to make sure that you are sufficiently prepared to learn the course material, handle the course homework and participate in course interactions.

To be successful in this course, the student should have a good working knowledge of Java. MET Java courses MET CS342 Data Structures in Java or MET CS565 Advanced Java Programming are sufficient. No previous knowledge of Design Patterns or object-oriented design is expected.

3. Course Policies

This course is a "learn by doing" course. You will have to do programming homework assignments to help you master the course material.

You are also expected to read the textbook and class notes in advance to prepare for each lecture. Advance preparation is essential for your understanding of the course concepts. Before each class, the instructor will post class notes, homework

assignments and additional announcements on the course Web site (http://blackboard.bu.edu/). Make sure that you print and read them before the class.

Be active in course interactions, express your opinions, display your knowledge, and ask your questions. If your understanding is incorrect, the instructor will provide you with additional explanations and references. If you do not speak up, your understanding will remain incorrect. This will negatively affect both effectiveness of the course for you and your grade.

Class attendance and doing homework on time are mandatory. If you have to skip a class or miss a deadline, do not worry - this course is designed for busy adults with many responsibilities, and it is more flexible than a regular day time college course. Still, it is your job to notify the professor that a professional or personal emergency occurred: you should ask for an extension PRIOR to the deadline and set the recovery timetable and priorities mutually agreeable with the professor.

Homework submitted late without prior permission will not be accepted.

4. Textbooks

Eric Freeman, Elisabeth Freeman, Kathy Sierra, Bert Bates
Head First Design Patterns, 2004, O'Reilly (required)

Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides
Design Patterns: Elements of Reusable Object-oriented Software
Addison-Wesley, 1995 (recommended)

Of course, the Gang of Four (a.k.a. GoF) book is the classic book that started it all. It is still highly regarded and widely quoted, and you should familiarize yourself with it. However, it is not a textbook and was not written as a textbook. Its teaching strategies (if there are any) are not designed with the needs of a learning student in mind. The book by Freeman et al (another gang of four?), by contrast, is written as a textbook, and its teaching strategies are very good (in my not-so-humble opinion).

5. Grading Criteria

Grades will be based on your participation in class discussions (10%), your grades for homework exercises (60%), and the final examination (30%).

Grading criteria for homework include: (a) correct implementation of the specified design pattern, (b) complete and non-redundant testing, (c) clearly and correctly written description of the design and testing and (d) correct use of UML or other notation.

6. Academic Honesty

The course is governed by the Boston University Academic Conduct Committee policies regarding plagiarism (any attempt to represent the work of another person as one's own). This includes copying (even with modifications) of a program or a segment of code or documentation or letting your work to be copied. Your participation in interactions with the instructor and your classmates is encouraged, but the work you submit must be your own. Collaboration is not permitted ((for more details, see http://www.bu.edu/met/for-students/met-policies-procedures-resources/academic-conduct-code/).

7. Computing Facilities

As a Boston University student, you have the right to use the bookstore, libraries, sport facilities, and parking. The same is true of Boston University computing facilities. If you wish to use a Boston University Academic Computer Center account, one will be created for you, and you will be able to use its Unix operating system and its Java compiler. The Center office and the terminal room are located at 111 Cummington Street and in several other locatoins (to open an account, you have to show a valid BU ID card and choose your user name and a Kerberos password). System help and information is available at 617-353-2784.

You can also use the MET College computing labs that include PCs running Windows, Linux, or Unix (808 Commonwealth Avenue, 2nd floor). To enter the lab, you should register your BU ID card with an operator. To use a PC, you log in using your BU user name and your Kerberos password.

This course, however, is not environment-specific. Those students who have access to other computer systems that support Java should feel free to use them. Make sure, however, that these systems run the Java (tm) 2 Platform Standard Edition (any version).

If you want to download the Java Development Kit to your personal computer, go to the Sun Microsystems web site. There is no need to go after the Enterprise Edition (J2EE), the Standard Edition (Java SE) is sufficient. Download the Java SE Development Kit (any version) from http://www.oracle.com/technetwork/java/javase/downloads/index.html. To download API documentation, click the Documentation tab on that page.

Notice that you do not need to learn how to use a debugger or an IDE (Integrated Development Environment) for this course. Learning these tools will significantly increase the number of problems you will have to deal with in this course. Meanwhile, the programming problems in this course are simple enough and could be written using a simple text editor. They should be debugged and tested using your intelligence, not sophisticated and complex software tools.

The recommended development environment is TextPad from http://www.textpad.com. Its trial version is free, its user interface is very simple and intuitive, and it is sufficient for

the course work. Make sure that you install Java JDK first and Textpad next to enable Textpad to find your version of Java.

8. Course Instructor

Your primary contact for the course during this semester will be the course instructor, Prof. Victor Shtern. Prof. Shtern came to the USA from Russia. He has many years of experience developing process control systems, database systems, operating systems, and systems for computer-aided instruction. Currently, he is Associate Professor at the MET Computer Science department of Boston University, where he designs and teaches credit courses on object-oriented technology, and conducts training seminars for professional programmers. He designed and taught computer-aided and distance education courses for several high technology companies, Boston University, and National Technological University.

Prof. Shtern is very enthusiastic about teaching this course and will make every possible effort to help you understand and master the course material in the most effective way. All course materials will be posted in the course Web site (http://blackboard.bu.edu/).

Learning is more enjoyable and productive when it is interactive. This course provides you with many opportunities to interact with the course instructor and with your classmates. Feel free to ask questions and make comments and suggestions.

Contact Prof. Shtern either in class or send a Blackboard email (a "message" in Blackboard terminology) or telephone (617-358-0003, leave a message if necessary) or regular mail (Boston University, MET Computer Science Department, 808 Commonwealth Avenue, Room 250, Boston, MA 02215). Use regular e-mail (vshtern@bu.edu) only in case of emergency

9. Office Hours

Regular office hours will be held on Mondays from 5 to 5:50 P.M. at 808 Commonwealth Avenue, Room 250, Boston, MA 02215. Other times could be arranged by appointment.

10. Establishing Feedback

To be sure that your Blackboard account is indeed activated and you are able to communicate with the professor, log in to Blackboard (using your BU user name and password) and send Prof. Shtern a "message" (not e-mail).

In your message, specify your name, BU ID, phone numbers and the email address that you will use for the course. Describe your professional background: current job, operating systems and programming languages you are comfortable with, computer

science courses you have taken at BU and elsewhere, your goals in taking this course. Send this message within two days after the first class.

MET CS665 Class Schedule Fall 2011

Class	Date	Topic	Chapter
1	Sep 12	Course introduction. Review of the software developemnt context in relation to design patterns. Advantages of using classes.	Notes
2	Sep 19	The uses of inheritance in software design. Principles of strong typing and substitution. Polymorphism with abstract classes and interfaces. Introduction to UML.	Notes
3	Sep 26	Design techniques for modifiability. The Strategy Pattern.	1
4	Oct 03	The Observer Pattern.	2
	Oct 10	Holiday, classes suspended	
5	Oct 17	The Decorator Pattern, the Simple Factory Pattern	3,4
5	Oct 24	The Factory Methods, the Abstract Factory Patterns	4
6	Oct 31	The Singleton Pattern, the Command Pattern.	5,6
7	Nov 07	The Adapter and Facade Patterns.	7
8	Nov 14	The Template Method Pattern	8
9	Nov 21	The Iterator and Composite Patterns.	9
10	Nov 28	The State Pattern.	10
11	Dec 05	The Proxy Pattern.	11
12	Dec 12	Compound Patterns.	12
14	Dec 19	Final examination.	