

CMSC433, Spring 2005
Programming Language Technologies and
Paradigms

Introduction

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Course Goal

To make you a better programmer

- Deconstruct relevant programming problems
- Solve them in an object-oriented style, focusing on
 - Reusability
 - Maintainability (clarity)
 - **Design**

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Approach

- Will use the Java programming language exclusively
 - But the ideas apply to other languages equally well
- Sequential object-oriented (OO) programming
 - Basic principles and tools, and
 - *Design patterns* to improve reusability and reliability
- Concurrent OO programming
 - Shared-memory multi-threading (Java Thread class), and
 - Distributed message passing (Java Remote Method Invocation)

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Topics

- Java review (2-3 lectures)
- Programming techniques and tools
 - Specifications and testing
- Design patterns
- Refactoring
- Concurrency
 - Concurrent programming in Java
 - Design patterns
 - Distributed programming
- To be determined
 - Possibilities include security, event-based programming, reflection, memory management, ...?

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Style

- Interaction
 - This is your course: what do you want to learn?
- Discussion
 - Not just professor/TA to student, but student to student, with regard to ideas, techniques, and solutions
- Learn by doing
 - If you don't put effort into the programming projects, you will learn very little

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Texts

- No required textbooks
- Recommended text:
 - Bruce Eckel, *Thinking in Java* (3rd Edition)
 - Java primer
 - A complete copy of the book can be downloaded for free
- See web page for more useful resources

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Class Accounts

- We will have accounts on CSIC machines
 - Linux cluster; RedHat
 - Lab is in room 3107 CSIC
- Class accounts will be emailed Friday morning
 - To the email account registered with UMEG
 - So make sure you check or forward that account!
 - Right after class: **check your e-mail address on TESTUDO**
 - If you don't get an account by Friday, e-mail us
- You may work on any machine you like, but...
 - Make sure you code runs on the linux lab

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Software

- Will be using **Java 1.4.2**
 - <http://java.sun.com/j2se/1.4.2/docs/api>
- May wish to use the **Eclipse IDE**
 - Installed on all CSIC machines
 - <http://www.eclipse.org>
 - Make sure your programs compile on the command line
 - Check for all necessary imports
- Will make use of **JUnit** testing package
 - Part of hw #2, may want to use later yourself
 - <http://www.junit.org>

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Projects

- Focus on networked applications
 - Encourages modular, abstract design
 - Admits natural use of concurrency and distribution
 - Relevant in our connected society
- Start small and build up
 - Develop a sophisticated family of software by course's end

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Project Submission

- Projects due at 6pm on due date
 - By Unix time of day
 - You must submit a good-faith effort
 - You can be **failed** for the course if you do not
 - Late submission up to 9am the next morning
 - Score is multiplied by 0.9
- Online submission procedure
 - Submit early and often
 - E-mail course staff to recover previous submit
 - Don't rely on us, though – back up your own work

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More on Projects

- Your programs **must** compile
- Grading will generally be automated
 - Occasionally a single bug will cause a lot of test cases to fail; let us know if this is the case for you
- Projects are the key to this course
 - Start early
 - Ask questions on newsgroup or in office hours

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Project Commentary

- For some projects, you will be emailed two other (anonymized) submissions
 - Respond with commentary on each with regard to the goals and techniques we are teaching
 - You will be graded on the usefulness of your commentary

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Exams

- Midterm: Thursday, March 17
 - Just before spring break
- Final: (Unofficial) Thursday, May 19
 - Covers all of course
 - But roughly 2/3 new material, 1/3 old material
- Do **not** schedule travel for these dates!
 - I will be jealous, not sympathetic

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Excused Absences

- Religious holidays or other personal conflicts
 - Let us know *as soon as you get the project*
- Medical and other emergencies
 - Must provide documentation stating what dates/times you were incapacitated
 - Self reporting is *not* sufficient

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Tentative Grading Plan

	#	% each	% total
Projects	6	8.33	50
Mid-terms	1	20	20
Final	1	30	30

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Discussion and Questions

- Read the newsgroup – csd.cmssc433
 - Only visible from inside UMD
 - For class discussion
 - TA's will read regularly, but may or may not respond. Do not expect real-time responses. This is not a substitute for coming to office hours.
 - **NB:** As in the rest of life, don't believe everything you read!
- **Don't cross the line**
 - Know the academic integrity procedure and follow it (see web page for more)

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Office Hours

- Professor Jeff Foster, [jfoster at cs.umd.edu](mailto:jfoster@cs.umd.edu)
 - 4129 AVW
 - M 1-2pm, TuTh 10:30 - 11:30am
 - Or by appointment
- TAs: Mujtaba Ali and Octavian Udrea
 - Office hours in 1112 AVW
 - See [web page](#)
- Always posted on class webpage:
 - <http://www.cs.umd.edu/class/spring2005>

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Stay up to Date

<http://www.cs.umd.edu/class/spring2005/emsc433>

Contains:

- Announcements
- Lecture notes
- Project assignments
- Resources
- And more!

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