MAHARISHI UNIVERSITY OF MANAGEMENT

Modern Programming Practices
The Field of All Possibilities is the Source of All Solutions
CS 401

Professor:

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Maharishi's Eighth Year of Invincibility

Global Raam Raj

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S Y L L A B U S

"The human brain physiology is the hardware of that cosmic computer, which can create anything through proper programming." " Life is here to enjoy " -- Maharishi Mahesh Yogi

GOAL OF THE COURSE

Programming is the most basic part of Computer Science, as it is the basic language for expressing structures, processes, algorithms, systems, everything computable and computing related. There are many different approaches and languages for programming, but currently object-oriented is the dominant model, and Java is the dominant language.

This course will provide an introduction to the OO paradigm, including analysis and design; to the use of UML to develop and communicate requirements and designs; and to implementation techniques, including an introduction to advanced features of the Java programming language (Java8).

COURSE OBJECTIVES, ACTIVITIES, AND ASSESSMENTS

This is what you'll learn to do*	This is how you'll learn it	This is what will show you've learned it
1. Be comfortable with fundamental object-oriented terminology and concepts (3,5)	By developing a "blueprint" that can be used as the basis for subsequently building an OO software system	Results from daily Quizzes, and Midterm exam.
2. Translate an object model into a working software application (3,5)	By practicing the techniques in Homework	Results from daily Quizzes, and Midterm exam.
3. Explain UML modeling basics clearly, and apply them pragmatically (3,5)	By creating class diagrams and sequence diagrams in Homework	Results from daily Quizzes, and Midterm exam.
4. Create and build JavaFX applications (3,5)	By solving problems daily for Homework	Results from Project, and Midterm exam.
5. Explore various Java 8	By writing programs using	Results from daily Quizzes,

topics and enhance your codebase with modern idioms (3,5)	lambda expressions, the Stream API, etc.	and Final exam.
6. Implement classes and methods that work with multiple types (3,5)	By solving problems daily from the Homework	Results from daily Quizzes, and Final exam.
7. Explain the connections between the Science of Consciousness and the Essentials of Programming (2)	By doing the appealing points with written Science of Consciousness connections	Short Essay Exam Question

*The numbers in parentheses refer to the MUM Essential Learning Outcomes that are best supported by this course objective; they appear in **boldface** in the list below. (highlight in bold those that best apply to your course objectives, activities and assessments)

1. Holistic development of consciousness and health
2. Consciousness-Based understanding (Knowledge)
3. Creative and critical thinking
4. Communication
5. Scientific and quantitative reasoning
6. Collaboration and leadership
7. Sustainable local and global citizenship

Topics include:

- Objects and classes
- Analysis of requirements and development of design
- UML class, sequence, and object diagrams
- Relationship between UML diagrams and Java implementation
- Inheritance, interfaces and polymorphism
- Open-closed principle
- Collection processing with lambdas and streams
- Advanced unit-testing and exception-handling
- Generic programming

Core Outcomes. By the conclusion of MPP, the student will be able to demonstrate the knowledge and skill in the following areas:

1. Ability to create class, sequence, and object diagrams based on a detailed problem statement
2. Ability to translate UML diagrams into Java code
3. Ability to recognize when inheritance and polymorphism are applicable and useful
4. Ability to decide between using composition in favor of inheritance
5. Know the difference between and relative advantages of abstract classes and interfaces
6. Implementation rules concerning inheritance, interfaces, and polymorphism
7. Beginning-level knowledge of JavaFX, XML, JDBC, SQL, Annotations, Generic Programming
8. Know best practices for overriding the methods in Object, and for implementing Comparators
9. Ability to design and implement lambda/stream pipeline queries to extract information from, and manipulate data in, given collections.
10. Ability to use method references in place of lambdas according to best practices
11. Know and able to apply best practices concerning the use of JUnit
12. Know and able to apply best practices regarding exception-handling in Java
13. Understand the important role of the inward stroke of programming in the field of software development

OFFICE HOURS, CONTACT INFORMATION AND BIOGRAPHICAL SKETCH

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Phone - (w) 641- 472-7000 x 4332

E-Mail :   rmohanraj@mum.edu

CS Tech Support: cstech@mum.edu

RECOMMENDED DAILY SCHEDULE

The daily schedule of all courses is designed to give students mastery of specific fields of knowledge and to cultivate higher states of consciousness for success and fulfillment in life. I recommend that you aim to be in bed by 10 PM, so that you are rested and fresh in the morning. If you have not finished your homework by then, then instead of staying up late to finish it, get a good night's rest and finish your homework in the morning before class. On Saturday, we meet only in the morning and follow the usual weekday format during the morning.

MORNING	
	Group practice of the Transcendental Meditation and TM-Sidhi programs
10:00 AM – 12:30 AM	Class lecture, discussion, activities, labs
12:20 – 12:30 PM	Group meditation
12:30 – 1:30 PM	Lunch and walk
AFTERNOON	
1:30 – 3:15 PM	Continuation of morning class, projects, exercises in-class reading, labs
2:45 – 2:50 PM	Stretch break
2:50 – 3:15 PM	In-class group practice of the Transcendental Meditation program for Meditators and Rising Sidhas
	Group practice of the Transcendental Meditation and TM-Sidhi program for Citizen Sidhas and Governors
EVENING	
	Dinner
7:00 – 9:00 PM	Homework (2 hours per evening)
9:30 PM	Rest

Grading components

The course grade will be determined according to the following

Activity	Percent Value
Labs	`10%`
Project	`10%`
Midterm Exam	`40%`
Final Exam	`40%`
Professional Etiquette	`tiebreaker`

Labs and Presentation

Each lesson has a corresponding lab. Some labs require Java code; others require creation of UML diagrams and other forms of documentation. Your work for each lab should be submitted as a group.

Groups may consist of 2-3 persons. Group submissions are done in the Submit folder for each lesson, as discussed in class.

During the second week of class, there will be a group project. In this case, each group will give a short presentation of their work on the project; evaluation will follow a rubric that will be handed out in class. Each group, after presenting, will submit the project in the Submit folder.

Academic Honesty

Students are expected to submit only their own work (except for labs or other activities designated as group activities). During exams, they must not look at other students' work, discuss exam contents with other students at any time (including bathroom breaks), or attempt to access outside resources (such as internet or email). The academic dishonesty policy stated on the Compro website is reproduced here:

Academic Dishonesty: Graduate students caught cheating will receive a grade of NC. A second case of cheating results in suspension from the university. Cheating includes copying from someone else as well as letting someone else copy your materials, or not following the policies during the test (e.g., not using a cell phone at any time or not having notes, etc).

Meaning of grades

We will use the following grading scale:

| Range	Letter Grade	Meaning of Grades
93 - 100	A	Excellent, exceptional
90 - 92	A-	Excellent
87 - 89	B+	Very good comprehension of course concepts and proficiency in course competencies
83 - 86	B	Good comprehension of course concepts and proficiency in course competencies
80 - 82	B-	Basic comprehension of course concepts and proficiency in course competencies
77 - 79	C+	Fair — meets minimal expectations for passing
73 - 76	C	Fair
70 - 72	C-	Fair
0 - 69	NC	No credit — did not attain course objectives at a minimal level

Course Texts and Resource Materials

- Cay Horstmann, *Core Java for the Impatient*, Addison-Wesley, 2015 (recommended) Covers Java 8
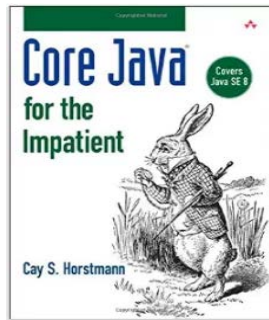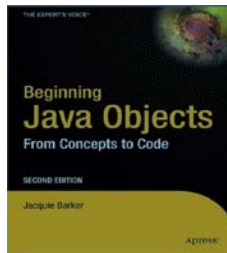

- Cay Horstmann**,** *Core Java Volume I--Fundamentals (9th Edition)*, Prentice-Hall, 2012. Covers Java 7, treatment is more thorough.
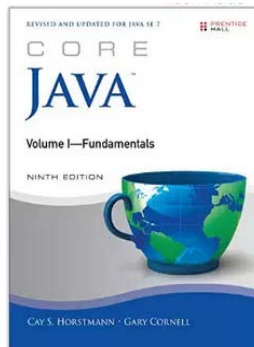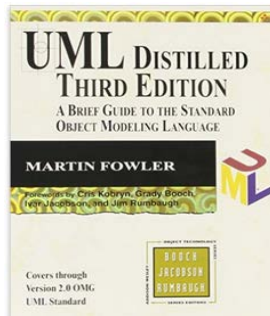

- **Cay Horstmann,** *Java SE 8 for the Really Impatient***, Addison-Wesley Professional, 2014. Covers JavaFX quickly.**
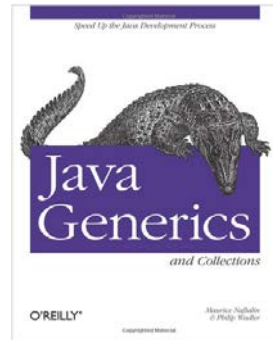
- Jacquie Barker, *Beginning Java Objects: From Concepts to Code*, 2nd edition, Apress, 2005. Intro to OOAD.
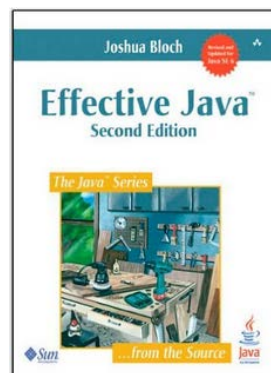

- Martin Fowler, *UML Distilled, 3rd Edition,* UML syntax and best practices.

- Naftalin and Wadler, *Java Generics.* Introduction to Java generics.

- J. Bloch, *Effective Java,2nd Edition.* Best practices in Java design and implementation.

END-OF-COURSE FEEDBACK

Please give us your feedback about the course. Near the end of the course, you should be receiving an email from Mike Farrer of the Evaluations Office that gives you a one-step login link. If you do not receive this email, you can request access by emailing Mike at mfarrer@mum.edu or go to Smartevals.com/mum and log in there.

- Your Username: your student ID in 000-00-0000 format.
- Your Password: your birth date in MM/DD/YY format.

REVIEW ACTIVITY

The following activity will be used frequently at the end of a class to review the new lesson:

1. At the end of the lesson, please write down in your own words what you consider to be the most important point of the lesson. (one sentence)

2. Relate this main idea to the growth of your own creative potential—or to the knowledge of full development of consciousness that you have gained. (one sentence)

3. Draw a diagram or illustration that integrates the two points.

4. One participant: Draw your picture on the board and present your review to the large group. Others: Share your review with a neighbor.

COURSE POLICIES

The following list of policies is meant to remind you of the policies in effect for this course. Most of these are University-wide policies explained in more detail in the University catalog, available online at www.mum.edu/catalog. If you are unsure how the policy works, feel free to discuss it with me after class.

Late homework (department policy) — Unless you are ill or prevented from turning in work by a family emergency, all assignments should be handed in on the day they are due. You may turn in homework one day late for a slightly reduced grade, but not after that. Please do not turn in assignments after the end of the course without prior arrangement (see "Incompletes" below).

Punctuality and attendance — Much of the value of a university class lies in the experience you have in class. For this reason, punctuality and attendance are highly valued at MUM. A class grade will be reduced at the rate of one percentage point for every 20 cumulative minutes late (up to two points per session), and three percentage points for an unexcused absence for a whole session (morning or afternoon). This policy also applies to leaving class early.

NOTE: If you do arrive late, please mark the number of minutes late on the Attendance/Punctuality Registry that is posted in the classroom.

Punctuality also extends to returning from the class break in a timely fashion (after 5 minutes). I should not need to go out and round you up.

An excused absence is defined as absence due to bona fide illness or family emergency. You are responsible for all readings and all written assignments whether you are able to attend class or not, and, in the interest of efficiency, please arrange to find out adjustments in assignments and other announcements from other classmates rather than from me if possible. I will be happy to give you any handouts you missed while absent.

Repeated unexcused absences are a violation of the MUM Code of Student Behavior. In addition to academic consequences, students with repeated unexcused absences are subject to disciplinary actions.

Contact me — In the rare event you must miss class or are sick, please contact me as soon as possible using the contact information above (email or phone) or send a message or note to class with a friend. If you keep me informed, I will know how you are doing and how to plan for each class.

Incompletes — Incompletes are given in response to student requests for work that cannot be completed during the course due to illness or family emergency and that does not exceed the equivalent of six sessions of a four-week course. If circumstances should arise during the course that would make you eligible for an incomplete before the end of the course, please contact me immediately.

If I give you an Incomplete, you will have the three days during the weekend immediately following the end of the course to make up that incomplete work. (If you are still sick that weekend, you may request an additional 32 days—that is, the work will be due by the end of the three-day weekend following the next block. If you are granted this incomplete, yet the work is not completed by then, the grade of Incomplete will automatically become a grade of NC.)

Academic Honor Code — Personal integrity, honesty, and honor are essential qualities of a capable student and a developing leader. The University has established an Academic Honor Code that sets forth the standards of academic honesty and personal integrity expected of all

students for all writing assignments and exams. Abiding by the Academic Honor Code will help you avoid academic dishonesty and plagiarism. Academic dishonesty includes a range of unethical behaviors undertaken to deceive anyone who may be evaluating your work for meeting course and/or degree requirements, such as cheating on an exam. Plagiarism means submitting or presenting someone else's work as if it were your own—without citations, quotation marks, or acknowledgment. Examples include copying text and/or graphics from online sources without attribution, copying a friend's paper, or purchasing an essay for submission.

Academic dishonesty and plagiarism are serious academic offenses. Here at MUM, you will get an NC on any homework that you have plagiarized. Additional penalties for plagiarism could include an NC in the course, academic probation, or suspension from the University for up to two full semesters, depending on the seriousness and intentionality of the violation (see pp. 363–367 in the 2015 MUM Catalog). For help in avoiding plagiarism, refer to http://plagiarism.org. Additional information is in the Student Handbook at http://www.mum.edu/handbook. If you are feeling pressured by assignment deadlines, don't risk everything by resorting to plagiarism. Come and talk with your professor instead.

Standards of appearance — The MUM faculty seek to create a coherent, focused, and dignified atmosphere on campus and in the classroom that supports the giving and gaining of knowledge. I ask that you dress in keeping with this purpose. This means:

- Neat, dignified, and modest clothing appropriate to the occasion is encouraged at all times.
- Torn, stained, and sloppy clothing are not appropriate.
- Immodest or revealing clothing is not appropriate (e.g., mini-skirts).
- Shorts are not appropriate for class, but shorts (other than short shorts) may be worn in the dining hall or while doing class projects outside the classroom when appropriate as determined by the faculty.
- Students from other cultures and traditions are welcome to wear traditional dress, provided the appearance is neat and modest.

Computers, cell phones, and pagers — Please turn off all cell phones and pagers at the start of class, so you will not inadvertently interrupt a lecture or class discussion. Evidence from a variety of studies indicates that by multitasking, you compromise your efforts to learn. Furthermore, *carrying on extended texting conversations in class is both inappropriate and distracting to your classmates, so please avoid these kinds of behavior.* We will discuss when and under what conditions classroom use of computers is appropriate.

Student Support Services — Beyond the normal support you will receive from me and your classmates, extensive on-campus support services are available for both academic and personal support that you may need at any time. To access these services, please stop by the Student Life Department in Room 105 of the Dreier Building between 10 a.m. and 4 p.m., Monday through Friday, or call the department administrator at 641-472-1225 for referral to the appropriate person.

Promoting Respectful Classroom Interaction — Maharishi University of Management is unique for the level of harmony and mutual support that exists on campus and in its classrooms. In this spirit, we honor cultural diversity as well as diverse backgrounds and viewpoints. While we welcome dialog from, and challenge to, all points of view, we ask that you maintain an open and supportive attitude toward your fellow classmates and University staff, and we do not tolerate harassment in any form.

Physical Activity at MUM — Maharishi University of Management offers a Health and Fitness Program to provide you with structure, guidance, and opportunities to engage in dynamic balanced physical activity. This balanced physical activity should include activities that foster the development of cardiovascular endurance, an appropriate ratio of lean muscle mass to body fat, muscular strength and endurance, and flexibility. All students are highly encouraged to participate in daily physical activity.

Writing Center—The MUM Writing Center is a free service for all MUM students. We offer academic writing support to students of all backgrounds and disciplines. Whether you are a graduate student, undergraduate, English language learner or native English speaker, you are welcome to drop in and have a conversation with one of the writing tutors. Our staff is prepared to work with you on any part of the writing process, from pre-writing to revising, to working on a thesis or a dissertation. Our tutors will provide you with immediate, constructive responses and suggest strategies for improvement. Even the best writers need an extra set of eyes!

The Writing Center is located on the west side of the MUM Library (behind the reference desk). Walk-in hours for August 2015 Forest Academy are M-F 3:30 PM to 4:30 PM. Regular hours (beginning August 31st, 2015) will be M-F 3-6 PM, Saturday afternoons 1-3 PM, and Sunday evenings 7-9 PM. Extended hours are easily available by appointment. To schedule an appointment, please stop by or email writingcenter@mum.edu. For questions, comments or concerns, or to learn more about the Writing Center, please contact Leah Waller at ext 4169 or email lwaller@mum.edu.