

MAHARISHI INTERNATIONAL UNIVERSITY



CS 544
ENTERPRISE ARCHITECTURE

*Frameworks and Best Practices Used in
Designing Large-Scale Software*

The Field of All Possibilities is the Source of All Solutions

Professor:
Payman Salek, M.S.

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ENTERPRISE ARCHITECTURE

“The Field of All Possibilities is the Source of All Solutions”

Frameworks and Best Practices Used in Designing Large-Scale Software

Payman Salek, M.S.

SYLLABUS

“Know That, by knowing which, everything can be known.”

—*The Upanishads*

“The regular practice of Transcendental Meditation is the direct way of rising to the state of transcendental Being and stabilizing it in the very nature of the mind, so that irrespective of the mind’s engagements in the conflicts inherent in the diversities of life, the structure of Unity in eternal freedom is naturally maintained and life is not lost to itself”

—*Maharishi’s Commentary on the Bhagavad Gita*

GOAL OF THE COURSE

The general goal of this course is to teach the fundamental concepts and practices used for creating large-scale enterprise applications.

We will examine the different architectural layers that are frequently used and different technologies associated with these layers, including Object Relational Mapping (ORM), Dependency Injection (DI), Aspect Oriented Programming (AOP), Container/Framework Managed Security, and integration/communication with other applications through Web Services (RESTfull and SOAP) and Messaging Queues.

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. Explain the principles behind frameworks, and why they are the foundation of enterprise applications	By attending the lectures and working with both the Spring and Hibernate frameworks in the labs	Short answer questions on daily quizzes and exams (especially exam 2)
2. Create mapping meta data to reconcile the differences between Object Oriented languages and Relational Databases	By practicing how to create mappings for object domains to relational database schemas	Mapping exercises on quizzes and exams (especially exam 1)
3. Know best practices for Object Relational Mapping for speed and efficiency	By integrating ORM into actual applications	Short answer question on quizzes and as demonstrated in your project
4. Apply Dependency Injection to create flexibility between different elements of an application	By studying how frameworks create and then link objects together, and then practicing in the labs	Dependency injection exercises on quizzes and exams (especially exam 2).
5. Apply Aspect Oriented Programming techniques to declaratively add additional features (e.g. Transactions)	By creating aspects and declaratively weaving them in between the program execution in the labs	Aspect Oriented Programming exercises on quizzes and exams (especially exam 2)
6. Create communication channels between different Enterprise Applications	By using JMS and Web Services (SOAP and REST) in the labs	Code questions on quizzes and exams (especially exam 3)
7. Explain the connection between the Science of Consciousness and Enterprise Applications	By writing appealing points (with a drawing) that have a science of consciousness connection	Short answer questions on the exams

OFFICE HOURS, CONTACT INFORMATION AND BIOGRAPHICAL SKETCH

Payman Salek, M.S.

Email: psalek@miu.edu

Phone: 515-661-4870 (Cell)

Office: Working from Home

Office hours: Call or email for appointment

Payman has over 25 years of professional programming experience (5 years of C/C++ and Assembly and 20 years of Java/JEE). Before turning to programming, Payman's main areas of interest were Antennas/Waveguides and Electromagnetic Radiation.

Most recently (2018-2020 and 2010-2015), Payman has worked for large corporations and financial institutions such as **Uline, Principal Financial Group, Vanguard, Bank of America and Ally Bank** as a Software Development Manager and Senior Java Developer/Designer/Architect.

Payman's main area of interest is Core Java, Web Application Development and OOAD.

EVALUATION PLAN

Grading components

Attendance and Contribution 5 points

Labs 20 points

Quizzes 10 points

Exam 45 points

Project 20 points

Total 100 points

Note: ~~You can get up to 1.5% of extra credit for regular morning meditation attendance~~

Meaning of grades

A (90–100) Excellent — meets the course objectives at an exceptionally high level

B (80–89.9) Good — meets the course objectives at the expected level

C (73–79.9) Fair — meets the course objectives at a basic level

NC (below 73) No credit — does not meet the course objectives

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.

<i>MORNING</i>	
	Group practice of the Transcendental Meditation and TM-Sidhi programs
10:00 AM – 12:00 PM	Class lecture, discussion, activities, labs
12:00 – 12:15 PM	Group meditation
12:15 – 1:15 PM	Lunch and walk
<i>AFTERNOON</i>	
1:15 – 3:00 PM	Continuation of morning class, projects, exercises in-class reading, labs
3:00 – 3:05 PM	Stretch break
3:05 – 3:30 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
3:30 – 6:30 PM	Finish Labs, Review Course Material, Exercise, ...
<i>EVENING</i>	
6:30 – 7:30 PM	Dinner
7:30 – 9:00 PM	Homework
9:30 PM	Rest

TEXTS AND OTHER REQUIRED CLASS MATERIALS

You will be required to purchase a physical copy of the course materials.

Because this material was initially developed for a training company by one of our faculty, I am not allowed to give you electronic copies. The material will be sold to you for \$25, which is just below the cost of printing.

Please bring notebook, pencil and eraser for in-class exercises.

OPTIONAL REFERENCES

Patterns of Enterprise Application Architecture by Martin Fowler

Publisher: Addison-Wesley Professional; 1 edition (November 15, 2002)

ISBN: 978-0321127426

Pro JPA 2 (Expert's Voice in Java) by Mike Keith and Merrick Schincariol

Publisher: Apress; 2nd ed. edition (September 24, 2013)

ISBN: 978-1430249269

Introducing Spring Framework: A Primer by Felipe Gutierrez

Publisher: Apress; 1st ed. edition (June 24, 2014)

ISBN: 978-1430265320

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.

MAJOR ASSIGNMENTS

Project • 10 points • due on last day of course

The project is meant to allow students to incorporate the knowledge of design patterns into designing a software project.

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.
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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 M.U.M. 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.

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 M.U.M. 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.

Incomplete work at the end of the course. — At the end of your course your professor will evaluate the work you have turned in according to the grading or evaluation plan announced in the first few days of the course. If there was work assigned that you were not able to complete by the end of the course *due to illness, family emergency, or other circumstances beyond your control*, you may petition the professor to turn in that work late for credit using a "Late Work Contract". (Late Work Contract forms can be picked up at the Enrollment Center, or downloaded from the MUM website. Search "Late Work Contract.") The petition must be submitted and approved before the end of the course, and then, if granted, the missing work should be submitted by the first Monday following the last day of the block, unless you are ill over the break between blocks. If you are ill over the break, your professor may allow you up to 32 days to complete the missing work. (Note: This option for submitting late work does not apply in the case of students who miss more than six sessions of a four-week course, nor is it to be used in the case of students who do not organize to get assigned work done according to the plan outlined in the syllabus. Students attending a course that ends at the end of a semester, students on Warning or Probation status, and Distance Education students may have different late work submission deadline requirements. Review the back of the Contract Form or contact the Registrar for more details.)