# Lesson 1

# Course Introduction:
# *Knowledge Has Organizing Power*

QUIZ IN PROGRESS
DOOR LOCKED FROM
10:00 to 10:05

# Topics:  Course Introduction

- Introduction to Software Engineering
- Problem statement for our class project

# Introduction to the Course

- Course Approach:
  - Each team project will cover all the steps of software engineering up to system testing.
  - Four or five people per team.
- See Sakai CS425-2015-05A-05D for lectures, readings, useful links, tests, assignments, etc.
- Grading:
  - 30% Test 1
  - 45% Test 2
  - 15% project deliveries and presentations
  - 10% quizzes, class participation, professional etiquette

# Introduction to the Course

## Lab Assignments

- The purpose of all labs and homework is to provide an opportunity for learning with a minimum pressure for graded outcomes.
- For the purpose of learning, all students should attempt their part of the lab individually, but are also encouraged to work in pairs or small groups.
- Discussions among fellow students are very beneficial to the learning process in order to clarify ones own understanding and to remove any road blocks that may slow down progress.

# Introduction to the Course

## Professional Etiquette

Consider MUM to be your employer, and your professor to be your technical manager. Just like a regular job, the inability to show respect can get you thrown out; regardless of work performance.  Failure to attend class, to be punctual, or to dress professionally can result in reduced grade, dismissal from class, or outright failure.

Courtesy during group meditation is a part of professional etiquette.  No typing, texting, reading, or talking during meditation.  We take 2 minutes of silence after meditation before starting activity.  Everyone is expected to allow their neighbors this 2 minutes of silence.

# Introduction to the Course

## Final Presentation - 15 minutes per group member

You will demo your code and show how it follows your class design. I will ask you to walk me through your source code, and I will evaluate that your source matches your design. Evaluation includes:

Does your code match your final design?

Can you show your code flow clearly?

Can you answer questions on how you implemented your use cases?

Can you show at least one unit test?

If there are parts of your use case not implemented can you describe the implementation?

Think of it as a job interview and be prepared to answer questions like the following:

your development experience – what you learned

design choices that you made

parts that were easy

parts that were complex

development process used – iterations, design/architecture/coding approach

f team experience – what worked well, what could improve

# Brief history of software engineering

- Early days: small toy programs
- As programming languages and processing speed improved, more useful applications were developed
- New problems arose in creating still larger applications:
  - Need for effective way to communicate requirements
  - Need for effective way to formulate and communicate design ideas; to record what has been done so far and why

# Evolution of Solutions

- Early solutions
  - More emphasis on documentation and good documentation styles
  - Tools were developed to help visualize software design (eventually, UML)
  - A new design paradigm emerged – the “Object-Oriented” paradigm, which greatly facilitated the process of building larger scale applications with less cost and fewer failures

# Software Development Processes and RUP

- Emergence of Software Development Processes
- As developers learned good OO techniques and documentation practices, the problem remained: How to put all of the techniques together to produce good software?
  - How long do we spend on initial requirements?
  - To what extent do requirements need to be fully understood before beginning design? Coding?
  - How do we formulate a plan for completing a project when most of the details about the project are unknown?
  - How do we make sure that the stakeholders for the project are satisfied with the result?

# Software Development Processes and RUP

- Software development processes address these concerns
- RUP = Rational Unified Process has become the industry standard for providing methods of development that provide reliable answers to these questions
- Agile Modeling, and agile development methods including SCRUM and eXtreme programming  are widely used.
- SCRUM and eXtreme are compatible with RUP.
- Goal –> optimize and choose the best software development method  based on project size, staff expertise, project goals, and other project specific characteristics.

# Fundamental Goals of Software Engineering

Examining the aims of development methodologies, we see several fundamental goals:

- A clear vision about a project that can be communicated to others (“see the tree in the seed”).
- Ability to respond positively to change
- Ability to minimize mistakes
- Ability to fulfill a large-scale intention (get the right result on time and within budget)

These aims have as much to do with the quality of the developer’s awareness as they do about development processes themselves

# The Role of TM in Software Engineering

- Hundreds of studies and the experience of thousands of practitioners – including software developers – verify that the qualities needed for successful software development are developed and enhanced by TM
  - Clear thinking
  - Ability to adapt to change
  - Ability to achieve goals
  - Ability to make fewer mistakes

# The Role of TM in Software Engineering

- *SCI Principles:*
  - *Subtler Levels of the Mind Are More Powerful.*
  - *Water the root to enjoy the fruit.*

1. Frequently during TM® or immediately after TM® solutions to problems will spontaneously arise.
2. The mind has had a chance to relax and transcend the level of the problem.

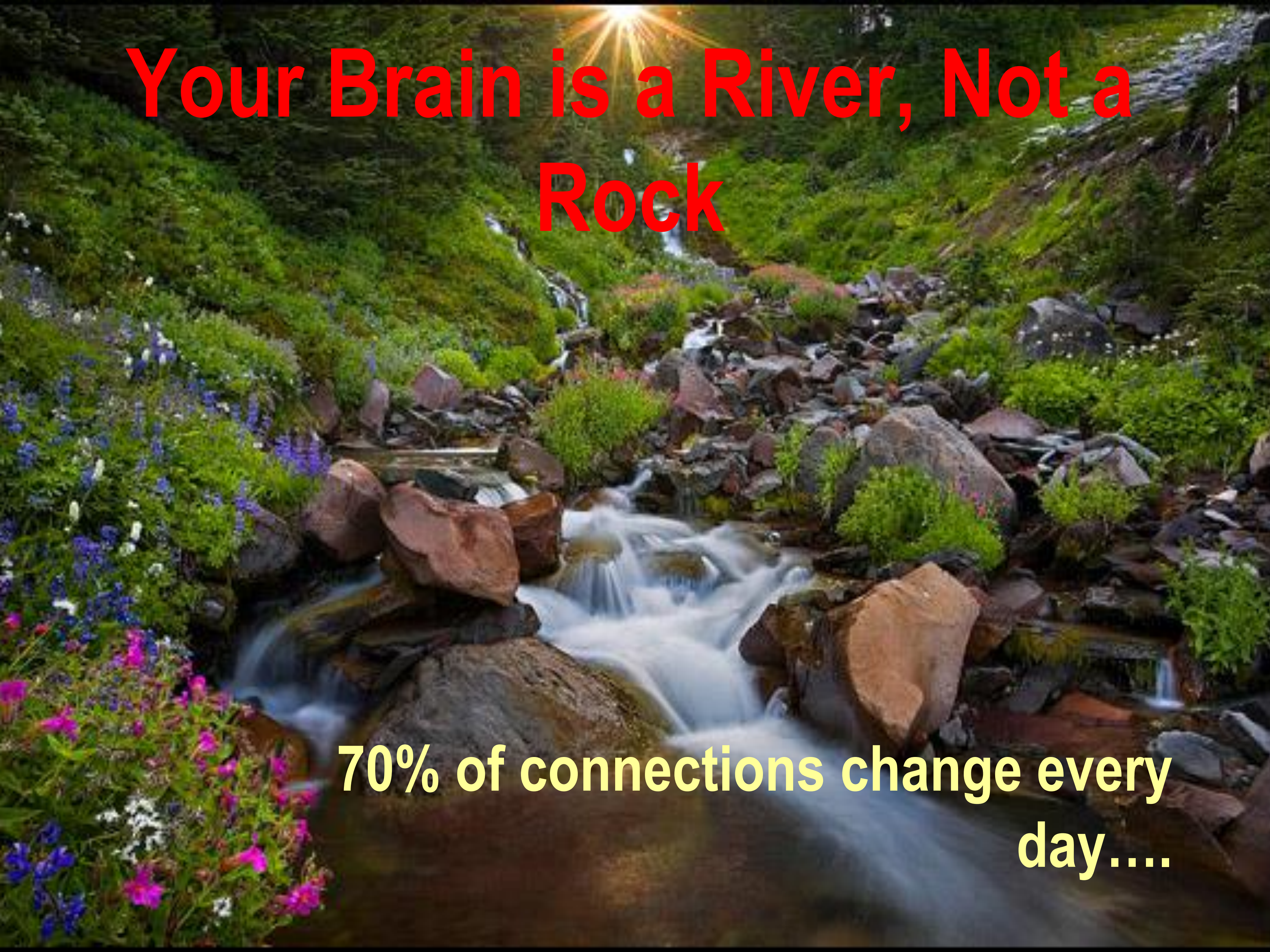
# The Role of TM in Software Engineering

- *SCI Principle:*

- *Release of stress and contact with Pure Consciousness supports spontaneous right action.*

1. Learn to recognize when you and your team members are being stressed.
2. Team dynamics will start to deteriorate under stress. Stress causes spontaneous **wrong** action.
3. Use TM® as a way to avoid and release stress.
4. One person with a balanced and calm perspective can improve a whole team's productivity.

# Your Brain is a River, Not a Rock



70% of connections change every day….

# Size and activity of our brain

- From - *Your Brain is a River, Not a Rock* – Dr. Fred Travis
- We start with 100 Billion neurons
- Each neuron can connect to over 1000 other neurons
- Total connections – 100 Trillion
- For first 3 years we add 24 Million new connections ***every minute!***
- Through training/studying we can optimize speed and reliability of our connections via myelination
- We have 100,000 miles of myelinated neurons/axons

# Transcending thought is infinitely more valuable than thinking.
# --Maharishi

# Course Project

- MUMScrum – our own freeware Scrum project management tool with a small human resources  management system for a small company.
- Scrum video: http://www.youtube.com/user/axosoft
- We will create the problem statement from the video.  Then add in the HR management features.

# Project

- We will use various technologies to help in developing the project . These technologies are examples of the type of tools used in the industry.  Teams may choose to use other comparable tools.
  - Rational Rose, StarUML, Visual Paradigm, Visual Studio UML, Violet
  - RUP
  - Scrum
  - MySql, Java DB
  - Java EE 7 and NetBeans
  - GitHub for team development and managing code
  - JUnit for testing

# Project

- Class Conventions:
  - The first two weeks are devoted to learning the RUP process and completing the RUP steps up to coding for our project.
  - Groups divide up the work to complete the class project
  - Once coding starts, groups use daily Scrums to assign and track work
  - Modifying design and requirements after coding starts is ok
  - Group work for all labs and assignments is ok
  - Each group does one early demo of their project
  - Be sure you are ready to do the tests, final quiz, and your project presentations on your own.