

## People and Project Groups

The project groups for this course are not based on the MSIT practicums or MSE studio projects. Instead, they are assigned in the first week of class.

## Objectives and Activities

Practical development of software requires an understanding of successful methods for bridging the gap between a problem to be solved and a working software system. In this course, you will study a variety of ways to understand the problem you're solving, the various factors that constrain the possible solutions, and approaches to deciding among alternatives.

After completing this course, you will be able to:

- Interact with potential users in order to gather data about work contexts
- Analyze user data and bring it to bear on system design
- Identify requirements conflicts, then reconcile using functional alternatives
- Adjust development to reflect an appropriate level of agility in your project

You will learn more by applying the ideas and explaining them to others than by listening to our lecture. To that end, the course requires these activities:

- **Homework assignments**, including questions to help you focus on important points in the readings and assignments to exercise particular skills
- **Project reports and presentations**, to apply course techniques to group projects and report to the rest of the class in oral and written form
- **Critique reports**, to sharpen your skills in analysis and critique of other people's work, and to deliver your critique in a clear, respectful, constructive manner
- **Reflection reports**, in which you will consider comments on your work product, reflect on your work process and results, evaluate your own performance and consider how to improve it
- **Class participation**, to enrich the discussion with your insights, relevant experiences, critical questions, and analysis of the material. Quality of contribution is more important than quantity.

We designed the course with the following time budget in mind; remember that this is the average time per week. It will take advance planning on your part to minimize the week-to-week variation, as each student will be making 1-2 significant class presentations.

- 3 hrs/week in class
- 6 hrs/week on reading, homework, and preparation for each class (this time will contribute to the project assignment as well)
- 3 hrs/week specifically on project assignments

In addition, students enrolled for Ph.D. credit will do a project that involves them in software engineering research related to the course.

## Course Textbooks

**Author: Axel van Lamsweerde**

Requirements engineering (RE) deals with the variety of prerequisites that must be met by a software system within an organization in order for that system to produce stellar results. With that explanation in mind, this must-have book presents a disciplined approach to the engineering of high-quality requirements. Serving as a helpful introduction to the fundamental concepts and principles of requirements engineering, this guide offers a comprehensive review of the aim, scope, and role of requirements engineering as well as best practices and flaws to avoid. Wiley, 2009. [Order it from Amazon.](#)

**Authors: Frank Armour, Granville Miller**

Use cases are increasingly popular, but many large organizations find it difficult to develop the complex use case models they need -- and poorly developed models fail to achieve their goals. In *Advanced Use Case Modeling, Volume I*, two leading use case experts present proven techniques for applying use cases in even the most challenging environments. The book begins with a clear, rigorous, example-driven explanation of the fundamental concepts of use cases. Next, the authors introduce repeatable processes for developing use cases that successfully drive systems design. Readers will learn the traps and pitfalls of use case design and how to avoid them; then discover new techniques for addressing the most important use case modeling issues -- several of which have never before been discussed in a book. Addison-Wesley, 2001. [Order it from Amazon.com](#)

## Evaluation

### For the MSE course, 17-652

Evaluation will be based on:

- Homework assignments (20%)
- Written project reports (25%)
- Reading Questions (15%)
- Revised project reports (15%)
- Report presentations (15%)
- Class participation (10%)

### Ph.D. Version of the Course, 17-752

This course is designed principally for professional masters students. It also serves Ph.D. students by adding a special project that involves the student in research issues associated with the course.

## Late Policy

All work is expected to be handed in at the indicated due date and time. For fairness to the whole class, no late submissions will be accepted for the group work, i.e. the project, critique, and reflection reports. In the first week of classes, you receive the schedules of all the core courses in addition to Methods. Please use those to plan ahead.

I understand that individual extraordinary circumstances do arise, hence each student is allowed 1 late submission for the individual homework assignments. In such a case, you should immediately notify the course TA before the submission deadline that you will submit late. Late work must be submitted as soon as circumstances allow, ordinarily within 24 hours of the due date. Please understand that these policies are for us to assist you better and in a reasonable time frame while respecting everyone's schedule and work load. If you have any questions you should raise them immediately rather than waiting for conflicts to arise.

**Learning Disabilities:** If you have a documented learning disability, please notify the instructor during the first week of class.

### **Academic Integrity**

Students are expected to follow the University policy on [cheating and plagiarism](#).

### **Office Hours**

Teaching Assistants :

Marat Valiev <marat@cmu.edu>: Mondays 2-3PM, Coach Library (SC266)

Shurui Zhou <shuruiz@andrew.cmu.edu>: Wednesdays 2-3PM, Coach Library

Instructor in 300 SCR, RM 270 by appointment, only.

Calendar for Methods

[Link](#)

## **17-652 Methods: Deciding What to Design Fall 2018**

SCR 265, Tuesdays and Thursdays 10:30-11:50 AM

Schedule Methods FA18

Mel Rosso-Llopart (rossollo@cmu.edu)

with assistance from Marat Valiev <marat@cmu.edu> and

Shurui Zhou <shuruiz@andrew.cmu.edu>

recitation on Friday 2-3pm

Homework Assignments are due by 10 AM on the day of  
class, as listed here unless otherwise indicated.

For Project/Critique/Revised report due dates, check corresponding columns.  
Readings preceded by an astrisk (\*) are optional, but recommended.

**SUBJECT TO CHANGE** Last update: 11/7/18

#	Date	Topic	Readings	Assignments
1	T 8/28	Course Introduction  Lecture 1	van Lamsweerde, ch. 1-2  * Deciding What to Design	
2	R 8/30	What are Requirements?  Lecture 2	The World and the Machine	<b>RQ1 Due</b>  <b>Project Selections due</b> <b>Friday 8/31</b>
3	T 09/04	Studies and Cases    Lecture 3	Who Killed the Virtual Case File (VCF)  Curtis Paper  * GAO Report on Sentinel  * Inspector General Audit Report  * SEI Report on Sentinel and Agile	<b>Homework 1 Due:</b> <b>VCF</b>

4	R 09/06	Interviewing, Focus Groups and Walkthroughs  Lecture 4		
5	T 09/11	Introduction to Personas and Goals  Lecture 5	van Lamsweerde, ch. 7	<b>Homework 2 Due: Elicitation</b>
6	R 09/13	Goal Analysis and Conflicts  Lecture 6	van Lamsweerde, ch. 8	<b>RQ2 Due</b>
7G	T 09/18	Quality attributes  Lecture 7	Matt Bass	<b>RQ3 Due</b>
8	R 09/20	Creative Design  Lecture 8	* Unexpected discoveries and S- invention of design requirements  * A preliminary framework for description, analysis and comparison of creative systems	<b>Homework 3 Due: Goal Modeling</b>
9	T 09/25	Project 1 Presentations		<b>Project 1 Reports Due</b>
10	R 09/27	Project 1 Presentations		

11	T 10/02	Introduction to Use Cases Lecture 11	Armour & Miller, ch. 8-10	
	R 10/04	Advanced Use Cases Lecture 12	Armour & Miller, ch. 12-13, 15	<b>RQ4 Due</b>
13G	T 10/9	Data Driven Development Lecture 13	Matt Bass	<b>Revised Project 1 Reports Due</b> <b>Peer Evaluations</b>
14	R 10/11	Requirements Management (Change focus) Lecture 14	van Lamsweerd Ch 6 Requirements Evolution <a href="#">Managing requirements informal way.</a> <a href="#">Requirements Trace-ability</a>	
15	T 10/16	Risk, Obstacles, and Misuse and Abuse Cases Lecture 15	van Lamsweerde, ch. 9 * Parrow, ch. 3	<b>Homework 4 Due: Use Cases</b>
16G	R 10/18	Use Cases, User Stories and other requirements representations Lecture 16	Eduardo Miranda <a href="#">User Stories</a> and <a href="#">Mapping Reading</a> (2 Readings)	<b><a href="#">RQ5 Due</a></b>

17	T 10/23	Project 2 Presentations		<b>Project 2 Reports Due</b>
18	R 10/25	Project 2 Presentations		
19G	T 10/30	Requirements in a Startup Environment Lecture 19	Michael Hilton	
20	R 11/01	Mock ups and Prototyping Lecture 20		<b>Due Friday 11/9 by 4:59PM :</b>  <b>Homework 5 Models and Mappings</b>
21	T 11/06	User Centered Design Lecture 21	Reading for next class: <a href="#">Thinking Driven Testing</a>	<b><u>Revised</u> Project 2 Reports Due</b>  <b>Peer Evaluations #2</b>
22G	R 11/08	Requirements and Software Testing Strategies Lecture 22	Jeffrey Gennari	
23	T 11/13	Project 3 Presentations		<b>Project Reports 3 Due</b>
24	R 11/15	Project 3		

		Presentations		
25	T 11/20	Design Theory Lecture 25		
	R 11/22	<b>Thanksgiving Holiday; No Classes</b>		
26G	T 11/27	Requirements Modeling and Analysis Lecture 26	Eunsuk Kang Reading: <a href="#">Deriving specifications from requirements</a>	
27	R 11/29 <b>Class from: 12 Noon to 1:20pm</b>	Requirements prioritization Lecture 27	Panel Discussion <a href="#">Prioritization Techniques</a> <b>Lunch will be provided</b>	<b>Revised Project 3 Reports Due</b> <b>Peer Evaluations #3</b>
28	F 11/30 2-3pm	<b>Course Summary</b> <i>Lecture 28</i>	<i>Final Q&amp;A about anything related to final deliverable's</i>	Wrap up for Teams with TA's in Recitation
29	Sunday 12/9		Readings to support final submission: <a href="#">How to write effective requirements</a> <a href="#">How to write quality requirements</a>	<b>Final Team Project full package, all parts and Individual Reports Due</b> <b>All work submitted by 5pm</b>

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