

17-652 Methods: Deciding What to Design

Instructor: Dr. Travis Breaux

Fall 2016

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 on the first day 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 us 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 a group projects and report to the rest of the class in oral and written form
- **Critique reports**, to sharpen you 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 PhD credit will do a project that involves them in software engineering research related to the course.

Evaluation

For the MSE course, 17-652

Evaluation will be based on:

- Homework assignments (20%)
- Written project reports (25%)
- Written critique report (15%)
- Revised project reports (15%)
- Project/Critique report presentation (15%)
- Class participation (10%)

PhD Version of the Course

This course is designed principally for professional masters students. It also serves PhD 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 : Every Tuesday 4:15 to 5:15pm, Coach Library, 300 SCR (or in the cave cubicles).
Instructor in Wean 5103 by appointment, only

17-652 Methods: Deciding What to Design

Fall 2016

SCR 265, Tuesdays and Thursdays 5:30-6:50 PM

Prof. Travis Breaux (breaux@cs. cmu. edu) and Prof. Mel Rosso- Llopart
with assistance from Jaspreet Bhatia (jhatia@andrew.cmu.edu) and Nishita Sharma
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Homework Assignments are due by 10 AM on the day of class, as listed here.
For Project/Critique/Revised report due dates, check corresponding columns.
Readings preceded by an astrisk (*) are optional.

#	Date	Topic	Readings	Assignments
1	T 8/30	Course Introduction	van Lamsweerde, ch. 1-2 * Deciding What to Design	Be prepared to discuss in class
2	R 9/01	What are Requirements?	The World and the Machine	Be prepared to discuss in class
3	T 09/06	Studies and Cases	Who Killed the Virtual Case File (VCF) Curtis Paper * GAO Report on Sentinel * Inspector General Audit Report * SEI Report on Sentinel and Agile	Homework 1 Due: VCF
4	R 09/8	Interviewing, Focus Groups and Walkthroughs		
5T	T 09/13	Introduction to Personas and Goals	van Lamsweerde, ch. 7	Homework 2 Due: Elicitation
6T	R 09/15	Goal Analysis and Conflicts	van Lamsweerde, ch. 8	
7T@	T 09/20	Working Backwards	Amazon's Working Backwards	Homework 3 Due: Goal Models

8T@	R 09/22	Creative Design	* Unexpected discoveries and S-invention of design requirements * A preliminary framework for description, analysis and comparison of creative systems	
9	T 09/27	Project 1 Presentations		Project 1 Reports Due
10	R 09/29	Project 1 Presentations		
11	T 10/04	Project 1 Critiques		Project 1 Critiques Due
12	R 10/06	Project 1 Critiques		
13	T 10/11	Introduction to Use Cases	Armour & Miller, ch. 8-10	Revised Project 1 Reports Due
14	R 10/13	Advanced Use Cases	Armour & Miller, ch. 12-13, 15	
15	T 10/18	Risk, Obstacles, and Misuse and Abuse Cases	van Lamsweerde, ch. 9 * Parrow, ch. 3	Homework 4 Due: Use Cases
16@	R 10/20	Operating Principles and Normal Design	* Vincenti, ch. 2	
17T	T 10/25	Project Presentations 2		Project 2 Reports Due
18	R 10/27	Project Presentations 2		
19	T 11/01	Project Critiques 2		Project 2 Critiques Due
20T	R 11/03	Project Critiques 2		
21	T 11/08	User Centered Design	Norman, Design of Everyday Things, ch 1.	Revised Project 2 Reports Due
22	R 11/10	Mockups and Prototyping		

23	T 11/15	Role Playing and Walkthroughs		Homework 5 Due: Models and Mappings
24@	R 11/17	Standards and Compliance		
25	T 11/22	Project 3 Presentations		Project Reports 3 Due
26	R 11/24	Thanksgiving Holiday; No Classes		
27	T 11/29	Project 3 Presentations		
27	R 12/01	Project 3 Critiques		Project 3 Critiques Due
28	T 12/06	Project 3 Critiques		
29	R 12/08	Course Summary		Revised Project 3 Reports Due