

Empirical Software Engineering Lecture 01

## Course Outline

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## Textbook

- C. Wohlin et al. **Experimentation in Software Engineering**, Springer. 2012.
  - Chapters 1 to 11 (Part I and Part II)

## Additional Literature

- General Software Engineering Books
  - I. Sommerville. **Software Engineering**, 9th Edition. Pearson, 2010.
  - R. Pressman. **Software Engineering: A Practitioner's Approach**, 7th Edition, McGraw-Hill Higher Education, 2009.
- Specific Books
  - Natalia Juristo and Ana M. Moreno. **Basics of Software Engineering Experimentation**, 1st edition. Springer, 2001.
  - N. E. Fenton, S. L. Pfleeger. **Software Metrics: A Rigorous and Practical Approach**, 2 edition, 1996.
  - M. Lanza e R. Marinescu. **Object-Oriented Metrics in Practice**. Springer, 2006.
- Papers

## Assessment Method (Graduate)

- Two Exams: 15 points each
  - 1st Exam: 07 October
  - 2nd Exam: 02 December
- Group Work: 20 points
  - Details soon
- Exercises: 10 points
- Final Project: 40 points
  - Details soon

**Dates may vary**

## Assessment Method (Undergrads)

- Two Exams: 30 points each
  - 1st Exam: 07 October
  - 2nd Exam: 02 December
- Group Work: 20 points
  - Details soon
- Exercises: 20 points
- ~~■ Final Project: 40 points~~
  - ~~○ Details soon~~

**Dates may vary**

## 3rd Exam (optional)

- The 3rd exam is allowed to students with at least 40 points (sum of all activities)
  - It replaces 1st or 2nd exam
  - 15 pts (Graduate) or 30 pts (Undergrads)
  - Expected Date: 09 December
- Which lectures to study?
  - If it replaces 1st exam: Lectures 1 to 12
  - If it replaces 2nd exam: Lectures 13 to 28

## Laboratory

- Sometimes, we may have lectures in laboratory
  - To book: ICEx 2011 or 2012
- Example
  - To simulate experiments in laboratory

## Course Website and Email

- All course material and agenda are available in the course website
    - Link "Teaching (pt)" in my webpage
- <http://www.dcc.ufmg.br/~figueiredo/disciplinas>
- Email: **ese.dcc@gmail.com**

## Group Work (GW)

- Students are going to be divided into six groups (G1 to G6)
  - Group size depends on class size
  - Maximum 3 graduate students per group
- Illustrative small experiment
  - To plan an experiment (or quasi-experiment)
  - To run it in a class
  - To present the results
  - To report in a small 5-page document

## Important Dates (GW)

	G1	G2	G3	G4	G5	G6
Form Group	05/10	05/10	05/10	05/10	05/10	05/10
Define Topic	05/10	05/10	05/10	05/10	05/10	05/10
Run Experiment	14/10	19/10	21/10	09/11	11/11	16/11
Present Results	04/11	04/11	04/11	25/11	25/11	25/11
Send Report	04/11	04/11	04/11	25/11	25/11	25/11

## Final Project (Graduate)

- Only for graduate students
  - Alone or in pairs
- Main tasks
  - To plan and run a case study, survey, literature review, or experiment
  - To present the results in a workshop
  - To report in a 15-page document (similar to a research paper)

## Important Dates (Final Project)

- Before 05/10 (the sooner, the better)
  - Register topic and abstract in EasyChair
- 04/12
  - Submit final report via EasyChair
- 07/12 to 11/12
  - Peer reviews via EasyChair
- 14/12 and 16/12
  - Oral presentation (workshop)

## Topics for the 1st Exam

- Empirical Strategies
  - Surveys, case studies, experiments
- Measurement
  - Product metrics and OO Metrics
- Bad Smell and Detection Strategies
- Systematic Literature Reviews
- Case Studies

## Topics for the 2nd Exam

- Experiment and Quasi-Experiment
  - Process
  - Scoping
  - Planning
  - Operation
  - Analysis and Interpretation
  - Reporting
- Experiments presented by group work

## Preliminary Agenda

1. Course Outline
2. Introduction to Empirical Studies
3. Empirical Strategies
4. Measurement
5. Bad Smells and Detection Strategies
6. Separation of Concerns

## Preliminary Agenda

7. **Exercise**
8. Seminar with Christian Kastner
9. Systematic Literature Reviews
10. Case Studies
11. Review to 1st Exam
12. **1st Exam**

## Preliminary Agenda

13. Experiment of Group 1
14. Experiment of Group 2
15. Experiment of Group 3
16. Experiment Process and Scoping
17. Experiment Planning
18. Oral Presentation: Groups 1, 2, and 3

## Preliminary Agenda

19. Experiment of Group 4
20. Experiment of Group 5
21. Experiment of Group 6
22. Operation
23. Analysis and Interpretation
24. Oral Presentation: Groups 4, 5, and 6

## [ Preliminary Agenda ]

- 25. Review to 2nd Exam
- 26. **2nd Exam**
- 27. Review to 3rd Exam
- 28. **3rd Exam**
- 29. Final Project Workshop
- 30. Final Project Workshop

## [ Next Lecture ]

- Motivation and Introduction to Empirical Strategies
- ESE book
  - Chapter 1
- Paper
  - Andreas Zeller, Thomas Zimmermann, Christian Bird. "Failure is a Four Letter Word". PROMISE 2011.