Software and systems engineering

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Course overview

Topics and expected results

Starting a new job or startup… Tasks

1. Defining, maintaining and managing requirements
2. Managing configurations and changes
3. Managing software projects
4. Implementing, maintaining and executing tests
5. Designing, implementing and maintaining features
   - Creating or adapting features
   - Finding and fixing bugs
6. Refactoring
   - Finding and fixing reuse and modularity issues

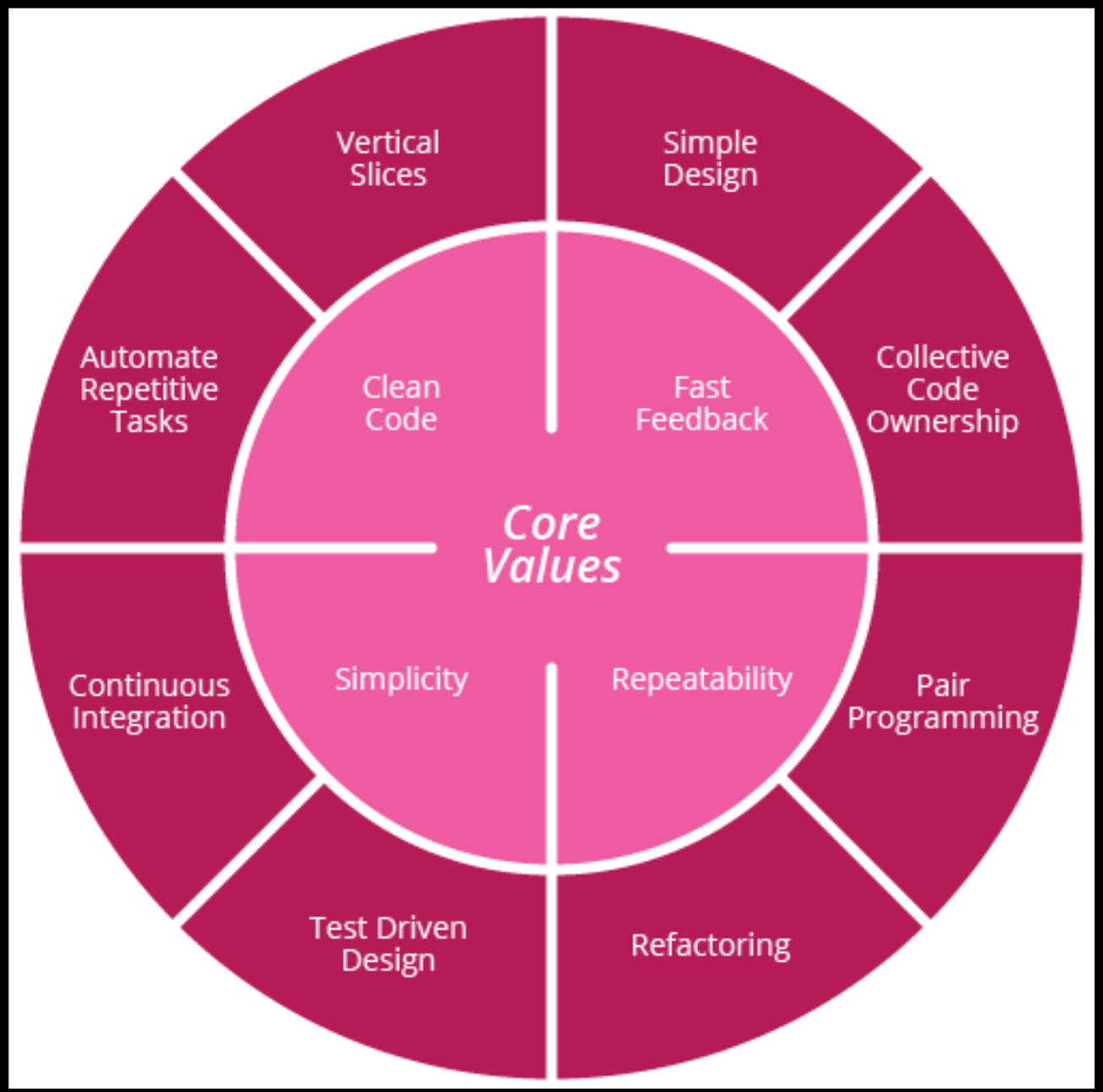
application and interaction design

architecture and implementation design

Starting a new job or startup… Background

- Process and collaboration technologies
  - git, GitHub, modular development
- Software architecture concepts
  - web architecture, patterns
- Programming and testing technologies for SaaS (software as a service)
  - HTML, Typescript, Angular, Node.js, Cucumber

Thoughtworks core values and practices



Expected results

- Develop quality systems, in a productive way, using techniques and tools
- Apply refactoring techniques to increase code reuse and modularity
- Critically compare techniques and tools, identifying their advantages, disadvantages, and limitations

Focus on Software as a Service (SaaS), not systems in general

Focus on Agile development, not more rigorous techniques

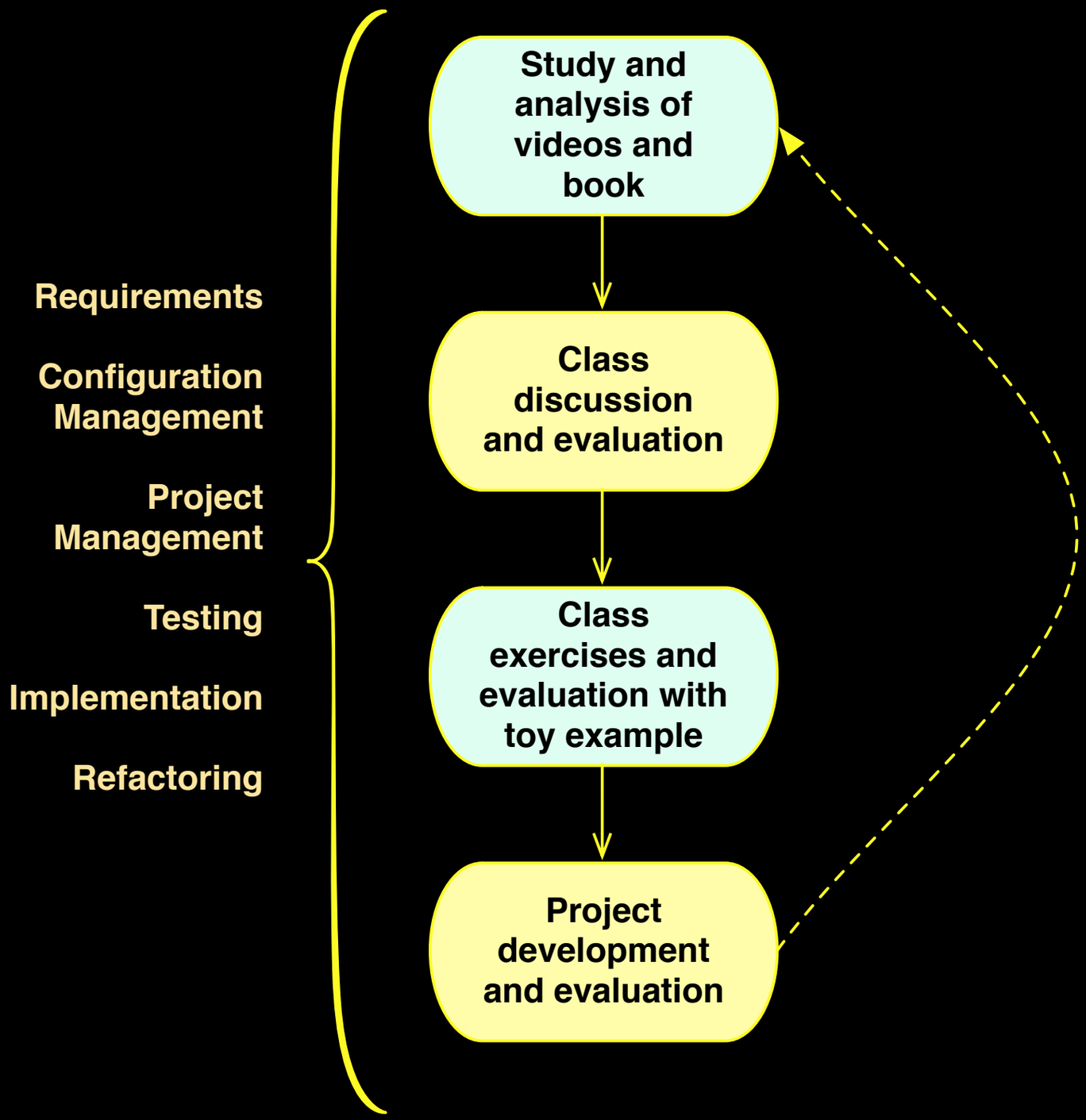
You will not become a software engineer with this course, but you will find out the way to become one!

Tasks and recommendations

Engineering activities are performed both with…

- a toy example, and
- an actual system

Course structure



Systems
(4 to 6 people per system, with individual evaluation)

- Non trivial system
- Frequent access to the stakeholders is mandatory
- Developed with the technology used in the example discussed in the course
- Existing or new system (and small, in case of new)

My expectations

- Ethical behavior (fraud implies in failing the course)
- Attendance to all classes and evaluation sessions (unless progress is shown before class)
- Punctuality
- Good time management and minimum dedication of 10 hours a week (including classes)
- Behave as CS elite

Textbook

Engineering Software as a Service: An Agile Approach Using Cloud Computing

by David Patterson and Armando Fox

http://www.saasbook.info

(Portuguese version is available, but English skills are very important for a software engineer)

You should primarily study by reading the textbook!

Studying by reading the slides and wikipedia is a very bad idea!

Classes are for
discussing the material
studied before the class

Do not expect to learn
only through classes!

Watch, read and practice!

Manage your time!

Make sure you make the most of this opportunity!

Carefully follow the course site!

https://
classroom.google.com

Carefully follow the course guidelines!

https://is.gd/essguidelines

Communication

ess-cc-ufpe.slack.com

#general, #naaula

google classroom

phmb@ (com [ESS] no subject)

Para quem precisa de uma melhor base de leitura e escrita em Inglês, recomendo muito investir agora. Reforço fortemente a importância do domínio do Inglês para a carreira em computação, e a disponibilidade de cursos de Inglês de baixo custo no CAC e no SENAC.

Course evaluation

Learning goals

Entender motivação e conceitos de requisitos	Entender motivação e conceitos de gerência de configuração	Entender motivação e conceitos de gerência de projetos	Entender motivação e conceitos de testes	Entender motivação e conceitos de projeto e implementação	Entender motivação e conceitos de refatoração

Elicitar e escrever com qualidade artefatos de requisitos	Participar efetivamente de equipes de desenvolvimento (revisar artefatos, se comunicar e colaborar efetivamente)	Implementar com qualidade testes de unidade, integração e aceitação	Projetar e implementar com qualidade features e cenários

Evaluation items

- Project (9)
- Class and slack participation (0.5)
- Quizzes (0.5)
- Exercise sets (1, extra point)

Project evaluation

- requirements (1)
- configuration management (1)
- project management (1)
- tests (2)
- design and implementation (3)
- refactoring (1)
- individual presentation (practical and conceptual questions, auto-evaluation)

Class and slack participation

- Asking questions
- Discussing topics
- Answering questions from other students
- Correcting answers from other students

Quizzes

Points per quiz question

```
function compararRespostasEComputarNotaDoAluno(respostaAluno, respostaProfessor) {
    var erros = errosPorOmissao(respostaAluno, respostaProfessor) + errosPorInclusao(respostaAluno, respostaProfessor)
    return calcularNota(erros,respostaProfessor.length)
  }
```

```
function calcularNota(erradas,numeroAlternativasCorretasProfessor) {
  var nota
  if (erradas == 0) {
    nota = 1
  } else if (erradas == 1 && numeroAlternativasCorretasProfessor > 1) {
    nota = 0.5
  } else {
    nota = 0
  }
  return nota
}
```

Summing up points of quiz questions

```
IF( points >= 2.5,  "MA",
                    IF( points >= 1.5, "MPA",
                                       "MANA")))
```

Points from quizzes

- Per quizz

  MA = 0.5/number of quizzes

  MPA = 0.3/number of quizzes

  MANA = 0

- Rounding class grades is subject to quiz participation

Exercise sets

MA = % of correct answers > 50 &&

% of wrong/undelivered answers < 20

MANA = % of wrong answers > 50

MPA = otherwise

MANA? = exercise set not delivered on deadline

Extra points from exercise sets

- Per exercise set

  MA = 1/number of exercise sets

  MPA = 0.6/number of exercise sets

  MANA = 0

- Subject to class attendance, participation, and solving exercises in class

quizzes are answered during classes (check calendar)

no second chance for quizzes

second chance for exams = final exam

Introduce yourself...

- Name
- What do you expect from this course?
- What questions do you have about the course?

Choose your system and join your team as soon as possible!

Take care of yourself

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Problemas para alunos do CIn

Outro problema que alguns parecem ignorar é que o CIn exige total dedicação do aluno ao curso. Enquanto é verdade que o aluno precisa se esforçar e, afinal, o CIn é da UFPE, não de uma instituição qualquer, com o perdão da palavra, fica difícil de manter o estudo, a própria dedicação e a motivação em alta com a montanha de exercícios, listas e miniprovas dados ao aluno. Os professores, em geral, tendem a pensar que apenas a disciplina deles existe e os alunos se vêem frequentemente inundados de coisas para fazer…

Problemas para alunos do CIn

Acho que uma das grandes dificuldades dos cursos do CIn é a questão que quando você comete um deslize a grande tendência é esse deslize se agravar. Reprova uma cadeira, perde acesso a benefícios, fica triste por achar que não é bom o suficiente, reprova mais uma, acha que agora lascou tudo de vez e sente agonia só de ir pra faculdade. Acho que uma solução é mostrar que mesmo falhando, há solução e há espaço pros alunos e indicaria um acompanhamento para alunos que estejam com problemas…

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