Presentation

course “Essentials of computing systems”

Feb.2024

course

- This course was conceived for programmers and software engineers who want to comprehend how the components of a computer work and how they affect the correctness and performance of their programs.
- Understanding how a computer works is fundamental for software engineers to comprehend the principles governing the execution of the programs they develop/maintain.
- It is also a fundamental knowledge if one wants to optimise the performance of a program, to write a compiler, or to develop an embedded system.
- This course is focused on describing the fundamental aspects of computers, by studying their organisation and structure.

topics

- Major pedagogical units:
  - Computer systems
  - Representation of information
  - Representation of numbers
  - IA32 instruction-set architecture
  - Cache memory
  - Code optimisations
- We assume that students know how to program a computer in a high-level language (e.g., C).
- Part of the contents of the course will be addressed in Laboratórios de Informática II.
- The contents of this course is continued in "Arquitetura de Computadores" (2.º ano / 1.º semestre).

professors

João M. Fernandes	JMF	T
André M. Pereira	AMP	PL1 PL2 PL6
André L. Ferreira	ALF	PL9 PL10
Manuel J. Alves	MJA	PL7 PL8
Paulo R. Sousa	PRS	PL3 PL4 PL5

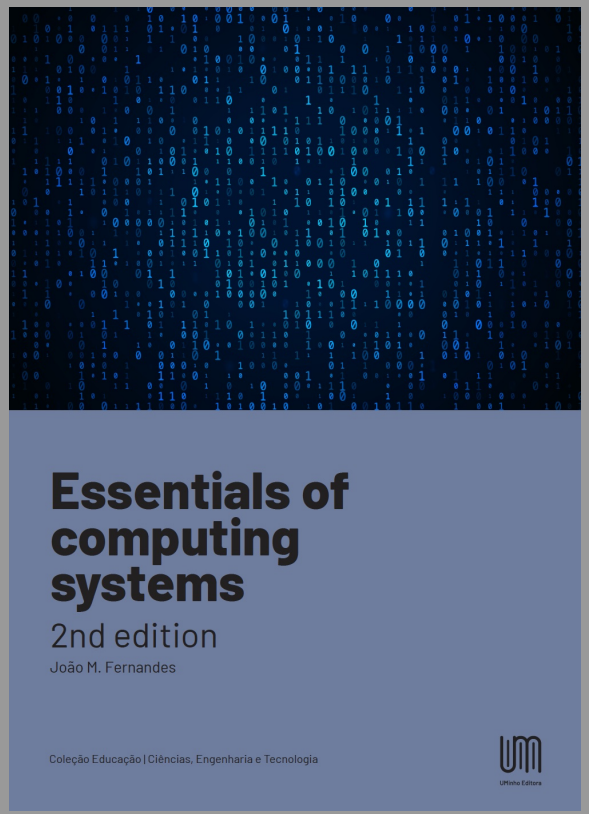




Professors can be reached through email, but they cannot guarantee immediate answer.

e-book

- A 100-page e-book was prepared to support the course.
- The e-book is free (published by UMinho-Editora).
- Students must read the book.
- Ambitious students must read other materials (e.g. suggested readings).



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T-classes

- Slides in English / Speech in Portuguese.
- T-classes serve to expose/discuss course contents.
- Contents are totally described in the e-book.
- Classes T1 (Mon 11-13) and T2 (Tue 11-13) tend to be equal (except in the 1st week).

PL-classes

- PL-classes serve to consolidate skills and knowledge.
- A mixture of traditional classes with TBL (team-based learning).
- Participation in 5 of the 6 TBL PL-classes is mandatory.
- Students are expected to prepare the PL-classes before entering the room.
- Solutions to exercises are provided in the e-book.
- Some classes require access to a computer (`gcc` compiler or access to `godbolt.org`).

Monday:
PL1 AMP 14-16
PL7 MJA 14-16
PL2 AMP 16-18
PL8 MJA 16-18
Tuesday:
PL6 AMP 15-17
Wednesday:
PL3 PRS 09-11
PL4 PRS 11-13
Tuesday:
PL5 PRS 09-11
Friday
PL9 ALF 09-11
PL10 ALF 11-13

schedule

segunda	sexta	T	PL	
2024/02/05	2024/02/09	Apres+Ch1+Ch2	-	
2024/02/12	2024/02/16	Ch2	TBL Ch1	
2024/02/19	2024/02/23	Ch3	ex. 2	
2024/02/26	2024/03/01	Ch3	TBL Ch2	
2024/03/04	2024/03/08	Ch3	ex. 3	
2024/03/11	2024/03/15	Ch4	TBL Ch3	
2024/03/18	2024/03/22	revisão testes	ex. 3	
2024/03/25	2024/03/29			
2024/04/01	2024/04/05	teste quinta 04.04		não há aulas
2024/04/08	2024/04/12	Ch4	TBL Ch4	
2024/04/15	2024/04/19	Ch5	ex. 4	
2024/04/22	2024/04/26	Ch5	TBL Ch5	feriado quinta 25.04
2024/04/29	2024/05/03	Ch6	ex. 5	feriado quarta 01.05
2024/05/06	2024/05/10	Ch6	TBL Ch6	
2024/05/13	2024/05/17	revisão testes	Debugger	
2024/05/20	2024/05/24	teste quinta 23.05		
2024/05/27	2024/05/31			
2024/06/03	2024/06/07			
2024/06/10	2024/06/14	exame quinta 13.06		

assessment

- Final mark is given by:
  - test n. 1 (50%).
  - test n. 2 (50%).
- Participation in at least 5 of the 6 TBL classes is mandatory to APPROVE.
- An overall minimum of 9.50 points is needed to APPROVE.
- A bonus of 0.125 points is given to the first student that detects any mistake in the e-book [max. 1.0/student].
- Marks are rounded up
  $11.00 \rightarrow 11, 11.20 \rightarrow 12, 11.50 \rightarrow 12, 11.99 \rightarrow 12$
- Students that attend both T- and PL-classes and that prepare themselves conveniently should approve with a good mark.