

EMBEDDED SYSTEMS PROGRAMMING 2017-18

Information About the Course

INSTRUCTOR

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Office hours: by appointment,
contact the instructor via email

TEACHING ASSISTANT

Simone Brazzo

Research Assistant

simone.brazzo@unipd.it

Ask him questions when he is in the lab (preferably)

Make arrangements via email

COURSE WEBSITE

- <https://www.dei.unipd.it/~fantozzi/esp1718/>
- Every information will be posted there
⇒ **look at the home page every single day**
- License: [CC Attribution-ShareAlike 4.0](#)

MOODLE SPACE

- <https://elearning.dei.unipd.it/course/view.php?id=1984>
- Restricted to students enrolled for grades

- **Do not enroll
before I tell you
to do so**



TEXTBOOKS

- No single textbook
- Slides from the lectures
- Material linked from the course website
- All the material for the course is in English

Advice: TAKE your own NOTES

SUGGESTED BOOKS

- B. Phillips, C. Stewart, K. Marsicano, “**Android** Programming: The Big Nerd Ranch Guide,” 3rd Edition, 2017
- R. Lukac, “**Computational Photography**: Methods and Applications,” 2010
- R. Szeliski, “**Computer Vision**: Algorithms and Applications,” 2011
- E. Reinhard et al, “**High Dynamic Range Imaging**,” 2nd Edition, 2010
- E. Gamma, R. Helm, R. Johnson, J. Vlissides, “**Design Patterns**: Elements of Reusable Object-Oriented Software,” 1995
- K. Arnold, J. Gosling, D. Holmes, “The **Java** Programming Language,” 4th Edition, 2005
- H. Schildt, “**C++**: The Complete Reference,” 4th Edition, 2002

CONTENTS

General structure: similar to ESP1617

- Only one platform (Android)
- Algorithmics
- Hands-on labs
- Extra lectures & activities with the TA (optional)
- Both L and LM students, with different projects

L & LM

**The course will no longer be offered to LM students
in the future**

- 2018: yes
- 2019: maybe
- 2020: definitely no

LAB (1/2)

- **“Aula Ue”** (on Mondays): lab lectures, extra activities
- **“Aula Ge”**: development of your project.
Free access; check reservations for exams, etc.
- **Integrated Development Environment for Android** (Android Studio);
- IDE includes an emulator

LAB (2/2)

- A network installation of the IDE is accessible from any lab workstation in the Department.
Setup procedure published before the lab begins
- You can install the IDE on your PCs as well:
connect to <https://developer.android.com/studio/>
and follow the instructions

SAFETY

- Before accessing the lab,
you must attend an **online course on safety**
1. Connect to
<https://elearning.unipd.it/servizioformazione/course/index.php?categoryid=15>
 2. Select “PARTE GENERALE”, then login
 3. Use “sicurezza” as the enrollment key

EXTRA ACTIVITIES

- 20 hours; the TA is in charge
- 2 slots: Mondays @4:30pm and Tuesdays @4:30pm
- Additional examples, details about useful libraries and tools, indications on how to apply course contents to your projects
- Optional, but...

BONUS POINTS FOR EXTRA ACTIVITIES

- If you attend $a \geq 75\%$ of the hours: 2 bonus points added to the grade of the oral exam
- If you attend $50\% \leq a < 75\%$ of hours: 1 bonus point
- Signatures collected at the beginning and at the end of each extra activity

AN IDEAL ORGANIZATION OF YOUR TIME

- Lectures: 72 hours
- Extra activities: 20 hours
(and you move towards the completion of your project)
- Independent study: 133 hours
- Grand total: 225 hours for 9 ECTS credits

ENROLLMENT

- 60 students maximum (40 L + 20 LM)
- Enrollment took place via GestNuPro 3 at the beginning of the academic year. **No latecomers.** Student lists available on the course website
- Students in the lists will be emailed for confirmation. If a student responds negatively, or does not respond within 24 hours, she/he will be **replaced**

HOW TO PASS THE COURSE

Group project
+
oral exam

(18 points + 12 points = 30 points)

GROUP PROJECT

- Weight: 60% (18 points)
- Get at least 10.8 points (i.e., 18) for a pass
- Groups of 3 L or 3 LM students.
All the students in a group will get the same mark
- Students can propose groups;
only LM students can propose projects
- Students not grouping and/or not proposing a project
will be forcibly grouped and/or assigned a project

ORAL EXAM

- Weight: 40% (12 points)
- Get at least 7.2 points (i.e., 18) for a pass
- Each student graded individually
- Questions on everything presented during lectures

- Project must be approved before the oral exam
(no project \Rightarrow no oral exam)

ABOUT THE PROJECT (1/6)

- The project is the most important contribution to the final mark

- Different members can have different roles



- ...But if one team member is lagging behind, then the project may fail, and everybody gets bad grades

ABOUT THE PROJECT (2/6)

- **Work as a team**
- **You will be evaluated as a team**
 - I don't care who does what
 - I don't care if a member does a bit more/less than the others
 - However, I do care if a member does nothing:
in this case, please notify me immediately

ABOUT THE PROJECT (3/6)

- **Standard Projects (L students only)**
 - Report on an Android topic not presented during classroom, plus a mockup app illustrating the topic
 - List of possible topics prepared by the instructor
 - Several groups can choose the same topic

ABOUT THE PROJECT (4/6)

- **Special Projects (LM students only)**
 - **App with significant algorithmic content, plus Report**
 - List of possible topics prepared by the instructor. Only one group per topic. Topics assigned on a first come, first served basis
 - Groups can propose **Custom Projects**

ON LM PROJECTS

- All LM groups must prepare a written project proposal
- Feedback will be provided, proposals can be rejected
- For Custom Projects: invent something really different!
- LM projects must embody significant methodological content, up to the point where just a portion of an app is defined
- Report: describe the design+development process: state of the art, proposed solution, implementation, measurements

PROJECT TYPES: SUMMARY

	L	LM
Standard	✓	-
Special	-	✓ proposal required
Custom	-	✓ proposal required

ABOUT THE PROJECT (5/6)

- There is a deadline for the formation of groups
- There is no deadline to decide which project to develop. However, the sooner you make up your mind (and have your proposal approved, for LM groups), the sooner you can start working

AVAILABLE HARDWARE

Hardware is available for groups who do not have any personal Android device

- **Nexus 7: 5 pieces**
- **Galaxy Nexus: 1 piece**
- **Pop C3: 4 pieces**
- **Smart Pad 706i: 1 piece**



HARDWARE I CAN BUY

- I can buy VR visors if some groups state to use VR in their projects
- Let me know as soon as possible



PROJECTS AND HARDWARE

- Hardware assigned on request on a FCFS basis
- Hardware assigned only after the project proposal has been approved
- Every group assigned hardware equipment will be responsible for it till the end of the course
- Hardware cannot leave the Department

BYOD

- If you develop the project on your own mobile device, remember to
 - **communicate your device model and OS version to the instructor when you submit your project,**
 - **take the device with you the day your project is discussed**
- This is the only way to ascertain the cause of glitches

ABOUT THE PROJECT (6/6)

To have your project graded, do the following.

1. Enroll in the session of your choice (via Uniweb)
2. By the day enrollment ends, send source code & report to the instructor by e-mail or some other means
3. In the day of the exam, discuss your project with the instructor. All project members must enroll & attend. At the end of the discussion, you will receive a mark

SITTING FOR THE EXAM

- Memento to L students:

“Per poter sostenere gli esami del terzo anno, gli studenti devono aver acquisito almeno 75 CFU complessivi e aver superato tutti gli esami del primo anno previsti dal manifesto degli studi (o riconosciuti come equivalenti)”

- You have been warned

EXPIRATION OF GRADES

- **Incomplete grades (i.e., project marks) will be valid until February 2019**
- **Consequence: If you complete the project this year, you must pass the oral exam before ESP1819 begins**

PROGRAM OF STUDY

- Update your program of study to include IN01122661 “Embedded Systems Programming”
- Update your POS it in a timely manner, or you will not be able to enroll for the exams and complete the course. You have been warned

ESPI 617: SOME FIGURES

- 122 students in the lists (89L+33LM)
- 60 students selected (40L+20LM)
- 55 students presented a project:
all of them received a positive mark
- 53 students passed the oral exam



ESPI 617: REMARKS

- Several L/LM students in the top 40/20 positions actually decided not to attend the course
- A further 8% of students dropped out after selection
- A record-breaking number of groups had issues, or split
- Several students (including 40% of LM students) presented the project & attended the oral exam in February 2018
- Bad grades in the oral exams

COURSE TIMELINE

- **March 19:** lab begins
- **By March 20:** projects published
- **March 28:** deadline for the definition of groups. By this date, each group must also choose a group name
- **June 1:** end of teaching assistantship

FINALS

- First session: end of June
- Second session: mid-July
- Third session: mid-September
- Fourth session: TBA (February 2019)

- All dates published on the course website

LAST MODIFIED: MARCH 26, 2018

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