

# COMPUTER ENGINEERING (LM55)

(Lecce - Università degli Studi)

## Teaching SYSTEM AND NETWORK PROGRAMMING

GenCod A005789

**Owner professor** Francesco TOMMASI

**Teaching in italian** SYSTEM AND NETWORK PROGRAMMING

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**SSD code** ING-INF/05

**Reference course** COMPUTER ENGINEERING

**Course type** Laurea Magistrale

**Credits** 12.0

**Teaching hours** Ore-Attività-frontale: 108.0

**For enrolled in** 2019/2020

**Taught in** 2019/2020

**Course year** 1

**Language** INGLESE

**Curriculum** PERCORSO COMUNE

**Location** Lecce

**Semester** Primo-Semestre

**Exam type** Orale

**Assessment** Voto-Finale

**Course timetable**  
<https://easyroom.unisalento.it/Orario>

### BRIEF COURSE DESCRIPTION

UNIX System Overview  
UNIX Standardization and Implementations  
File I/O  
Files and Directories  
System Data Files and Information  
Process Environment  
Process Control  
Process Relationships  
Signals  
Threads  
Thread Control  
Daemon Processes  
Advanced I/O  
Interprocess Communication  
Network IPC: Sockets  
Terminal I/O  
Cybersecurity  
(Disassembling an executable  
Following the execution of a process at machine code level  
Buffer overflows  
Shellcode)

### REQUIREMENTS

All the concepts presented in the "Sistemi Operativi" course in the first level degree "Ingegneria dell'Informazione". Namely, a good knowledge of: UNIX® basic concepts, the UNIX® bash shell, bash scripting, main UNIX® commands

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## COURSE AIMS

### Overview

The course aims at starting the students off on programming system applications (e.g. a server) on a UNIX® System.

Learning Outcomes; after the course the student should

- \* Know the most important functionalities and facilities offered by a UNIX® system, the System Calls (and, more generally, the APIs) offered to access them.
- \* Be able to write efficient CLI (Command Line Interface) system and network applications in the C language.
- \* Know how to write interoperable applications by complying with the UNIX® standards (SUSv3, SUSv4).
- \* Know which are the main differences between the MacOS and the Linux varieties and how to cope with them.

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## TEACHING METHODOLOGY

The course is strongly oriented towards an hands-on methodology. Students must follow lectures in front of a computer which must be used to reproduce and test what is explained by the teacher-

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## ASSESSMENT TYPE

Writing a C program aimed at solving a given problem within a given time. Students are free to consult (paper and digital) texts and to use Internet search engines.

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## FULL SYLLABUS

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Shellcode)

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## REFERENCE TEXT BOOKS

Stevens, Rago, Advanced Programming in the UNIX Environment, 3rd Edition, Addison-Wesley, 2013 ISBN 978-0321637734

Stevens, Fenner, Rudoff, Unix Network Programming, Volume 1: The Sockets Networking API (3rd Edition), Addison-Wesley, 2003 ISBN 978-0131411555

Kerrisk, The Linux Programming Interface, NO STARCH PRESS, 2010 ISBN 978-1593272203

Handouts delivered by the teacher through <http://moodliis.unisalento.it/>