



# Course program and reading list

Semester 2 Year 2024

**School:** Efi Arazi School of Computer Science B.Sc

## System Programming in C

### Lecturer:

Prof. Ilan Gronau [ilan.gronau@runi.ac.il](mailto:ilan.gronau@runi.ac.il)

### Tutors:

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### Teaching Assistant:

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<b>Course No.:</b>	<b>Course Type :</b>	<b>Weekly Hours :</b>	<b>Credit:</b>
3144	Lecture	3	3

<b>Course Requirements :</b>	<b>Group Code :</b>	<b>Language:</b>
Final Exam	242314401	Hebrew

### Prerequisites

## Equivalent:

59 - Data Structures

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59 - Data Structures

417 - Introduction To Computer Science

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## Course Description

The course is divided into two parts: The first four weeks are devoted to studying the basics of the Linux environment and shell scripting; the remaining eight weeks are devoted to procedural programming in the C programming language. Through this, we learn how computer programs are structured and how memory is maintained.

Topics covered:

### Section I - UNIX / Linux:

- The Linux file system and file management
- Text processing commands
- Pipes and redirection
- Text manipulation through regular expressions
- Shell scripting in Bash

### Section II - C:

- Flow of control
  - C types and how they are represented in memory
  - Operators and expressions
  - Basic handling of input and output
  - Functions and program structure
  - Pointers and arrays
  - Memory allocation types: automatic, static, and dynamic
  - Structures
  - Writing and compiling multi-file programs and implementing Object Oriented Programming (OOP) in C
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## Course Goals

The main objectives of the course are to convey basic skills in procedural programming and to teach bottom-up programming.

Bottom-up programming entails memory management and construction of data structure

from basic types.

These objectives are achieved through programming in C and work on a server Linux.

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## Grading

The course grade is comprised of 20% for homework assignments (6 during the semester) and 80% final exam

**Note: Both components must be passed to obtain a passing grade.**

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## Learning Outcomes

The course provides basic knowledge and skills in procedural programming in C and in work in the UNIX/Linux environment.

Through this, students learn how computer programs are structured and how they are executed on RAM.

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## Lecturer Office Hours

See Piazza for details: <https://piazza.com/idc.ac.il/spring2024/cs3144/staff>

(special reception hours can be scheduled by e-mail appointment)

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## Tutor Office Hours

See Piazza for details: <https://piazza.com/idc.ac.il/spring2024/cs3144/staff>

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## Teaching Assistant

See Piazza for details: <https://piazza.com/idc.ac.il/spring2024/cs3144/home>

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## Reading List

1. Al Kelley, Ira Pohl, A Book on C: Programming in C (4th Edition)
2. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language (2nd Edition)
3. Mark G. Sobell, A Practical Guide to the UNIX System (3rd Edition)

4. Mark G. Sobell, A Practical Guide to the Linux Commands, Editors, and Shell Programming (3rd Edition)

5. Randal E. Bryant, David R. O'Hallaron, Computer systems: a programmer's perspective