

CS Basics

o) Introduction

Fall Term 2023-24

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Introduction

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PhD at the University of Caen (France)

Professor at the Berner Fachhochschule

- Teach Computer Science in Biel since 1999
- Specialties: Low Level Programming (C, ASM, OS) and Web Security

Web Security and Privacy protection on the Web

- Member of the Institute for Cyber-security and Engineering (ICE)
 - Privacy Protection on the Web (e-Health and Darknet)
 - E-Money

Course: CS Basics

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Goals of the course

- You understand the architecture of a computer
- You can write small programs in assembler language
- You can write programs in C
- You can write libraries in C
- You can compile and link programs with libraries
- You understand the way memory works on the x86 PC architecture

BTI1021

- 4 ECTS \equiv 120h of work for the *average* student
- Mandatory for first year computer science students
- In module qualification group A

Grading

BTI1021 is a Pb module:

Midterm exam: 25% of the grade

- 60 minutes
- Takes place during the semester, normally in the week before the special week
- Contents: assembler programming
- 4 double-sided (or 8 single-sided) A4 pages of notes, copies etc. allowed
- No other material is allowed, especially no electronic devices

Final exam: 75% of the grade

- 120 minutes
- Takes place during the exam weeks in January, announced later
- Contents: all topics treated in the course, except those marked as optional (“★”)
- 4 double-sided (or 8 single-sided) A4 pages of notes, copies etc. allowed
- No other material is allowed, especially no electronic devices

Schedule of the course

Assembler language and computer architecture

- Bases 2, 8 and 16
- Computer architecture
- CPU instructions
- Assembling programs


The C Programming language


- Loops, conditions, constants
- Pointers and arrays
- Strings, input / output
- Libraries, linking, including parts in assembler
- Creation of processes

Notation

Throughout the course slides, we'll use some notation to highlight things:

 **Hint:** provides useful information which may help understand or do things.

 **Optional task or topic:** Denotes an interesting topic recommended for further self-study, not part of the exam.

 **Warning:** Indicates something important.

Information about the course

Course material can be found on <https://moodle.bfh.ch/>

- Schedule
- Link to the git repository
- Resources (bibliography and links)

Git repository:

- Slides
- Examples
- Exercises

Bibliography

Book used for the assembly parts:

Assembly Language Step by Step (3rd Edition),

Jeff Duntemann,

Wiley 2009

Note: This book does not cover the modern x86_64 architecture!

There are many books for C, here is a possible one:

C Programming in One Hour a Day, Sams Teach Yourself (7th Edition),

Bradley L. Jones / Peter Aitken / Dean Miller,

Sams Publishing 2013

Who are you?

What is your language?

- German
- French
- Other

Do you know programming?

- Programming at work?
- Apprenticeship in CS?
- Visited the pre-course in programming?
- No knowledge at all?