

# Computer Science Basics Presentation

Fall Term 2025/2026

Emmanuel Benoist | BFH-TI

## Course : “Grundlagen der Informatik”

### Goals of the course

- The students know the basic of what computer science is.
- They can manipulate numbers written in hexadecimal base.
- The students have an overview of the way data can be coded in a computer. Coding of numbers (negative or float), of text and binary data.
- They have seen and installed a Unix Virtual machine and know how to use it.
- They know the basics of compression.
- They know the basics of cryptography.

### Module BTX8o6o

- Grundlagen der Informatik

### Contact

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## Presentation

### Emmanuel Benoist

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PhD at the University of Caen (France)  
Professor at the Berner Fachhochschule

- Computer Science Department in Biel since 1999
- Actual courses: Assembler, C, Operating Systems, Web Programming and Web Security

### Research

- Member of the Institute for Cybersecurity and Engineering (ICE)
  - Web Security
  - Privacy Protection on the Web
  - e-Health

## Control of Knowledge

### Pb Module

- One final Exam (90 minutes)
- One test (60 minutes)
- Small questionnaires at the beginning of each course
  - only the 8 best count
  - 2 points per questionnaire where you have more than 4 from 5 OK
  - 1 point if you have at least 2 good answers.
  - Maximum is 15 points

### Grading (100 Points)

- Questionnaires = 15 pts
- Test = 20 pts
- Exam = 65 pts

### Marks

- 6.0 : Points  $\geq$  90
- 5.5 : Points  $\geq$  80
- 5.0 : Points  $\geq$  70
- 4.5 : Points  $\geq$  60
- 4.0 : Points  $\geq$  50
- 3.5 : Points  $\geq$  40
- 3.0 : Points  $\geq$  30
- 2.5 : Points  $\geq$  20
- 2.0 : Points  $\geq$  10
- 1.5 : Points  $\geq$  5
- 1.0 : Points  $<$  5

## Schedule of the course

- **History of computer science**
  - from Babage to real computers
- **Architecture**
  - What is in a computer?
  - What is the role of an operating systems?
- **Encoding**
  - Int / hexadecimal
  - 2-complement notation for negative numbers
  - IEEE754 Float notation
- **Unix world**
  - Installing Linux, some commands
- **Encoding of text files (accents, special chars)**
  - Iso-Latin1 and other 8-bit encoding
  - UTF-8
- **Compression of files**
  - Lossless compression (ZIP)
  - Lossy compression (images and Video)
- **Bases of Cryptography**
  - Symetric cryptography; Asymetric cryptography, PKI.

## Who are you?

Which apprenticeship did you do?

Are you working? What sort of job do you do?

## Information about this course

### Moodle of the course:

<https://moodle.bfh.ch/course/view.php?id=41472>

- Slides
- Examples
- Exercises
- Resources (bibliography and Internet)

## Questions?

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