



COURSES IN ENGLISH FOR EXCHANGE STUDENTS
Computer Science, Multimedia and Internet
CSMI

Computing Science, Multimedia and Internet :

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Introduction to database	CSMI1-01
Data Structures and Fundamental Algorithms	CSMI1-02
Introduction to Algorithms and Programming	CSMI1-03
Writing for digital media	CSMI1-04
Web integration	CSMI1-05
Computer Science English	CSMI1-06
Multimedia and Internet English	CSMI1-07
Advanced object-oriented design and programming	CSMI3-01
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Web development	CSMI3-07
Internship/ Professional project in Computer Science	CSMI5-01
Basis of object-oriented programming	CSMI2-01
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Distributed Programming	CSMI4-03
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DATABASES

Introduction to database

Objectives:

Understand what a relational data base is. Learn some commands from SQL: create tables and query them, mainly data definition language et data manipulation language. Know the first 4 normal forms.

Skills:

Gathering data in tables, combining tables from the same database, querying tables.

Prerequisite:

No prerequisites. Organization skills would be appreciated.

Hours:

<u>Lecture:</u>	10
<u>Tutorial Classes:</u>	12
<u>Practical work:</u>	12

ECTS: 6

CSMI1-01

ALGORITHMS, PROGRAMMING LANGUAGES

Data Structures and Fundamental Algorithms

Objectives:

Know how to move from the design of an algorithm to its implementation in a programming language, be aware of strategies to reuse and to ensure quality

Skills:

Technical design of a computer solution.
Production of a computer solution.
Validation tests for a computer solution.

Prerequisite:

Knowing how to break down a problem into simpler sub-problems and define simple types to structure a data problem, paying attention to programming quality criteria.

Hours:

<u>Lecture:</u>	9
<u>Tutorial Classes:</u>	16
<u>Practical work:</u>	16

ECTS: 5

CSMI1-02



Spring



Autumn

ALGORITHMS, PROGRAMMING, LANGUAGES
Introduction to Algorithms and Programming

CSMI1-03

Objectives:
 Know how to break a problem down into simpler sub-problems and define simple types to structure a data problem, pay attention to programming quality criteria

Skills:
 Technical design of a computer solution.
 Production of a computer solution.
 Validation tests for a computer solution.

Hours:

<u>Lecture:</u>	9
<u>Tutorial Classes:</u>	20
<u>Practical work:</u>	30

ECTS: 6

DIGITAL COMMUNICATION
Writing for digital media

CSMI1-04

Objectives:
 Analyze and design an interface (navigation, ergonomics, accessibility, design of the user experience – UX).

Skills:
 Knowing how to develop a scenario for a web or a multimedia object.
 Knowing how to apply the foundations of web ergonomics.
 Designing the usability of an interface.
 Having a general culture of multimedia.

Hours:

<u>Lecture:</u>	9
<u>Tutorial Classes:</u>	10.5
<u>Practical work:</u>	8

ECTS: 4



Spring



Autumn

WEB

Web integration

Objectives:

Learn the basics of html (html5) and css basis

Skills:

Design and production of websites

CSMI1-05

Hours:

<u>Lecture:</u>	3
<u>Tutorial Classes:</u>	8
<u>Practical work:</u>	12

ECTS: 4

ENGLISH

Computer Science English

FOR NON-NATIVE SPEAKERS

CSMI1-06

Hours:

<u>Lecture:</u>	9
<u>Tutorial Classes:</u>	16
<u>Practical work:</u>	16

ECTS: 5



Spring



Autumn

ENGLISH
Multimedia and Internet English

CSMI1-07

FOR NON-NATIVE SPEAKERS

ECTS: 5

ANALYSIS, DESIGN AND APPLICATIONS DEVELOPMENT
Advanced object-oriented design and programming

CSMI3-01

Objectives:
 Produce a detailed design by applying design patterns, implement it using object-oriented programming good practices.

Skills:
 Producing a detailed design by applying design patterns, implementing it using object-oriented programming good practices.

Prerequisite:
 Object-oriented design, object-oriented programming

Hours:

<u>Lecture:</u>	12
<u>Tutorial Classes:</u>	18
<u>Practical work:</u>	14

ECTS: 5



Spring



Autumn

DIGITAL COMMUNICATION
Writing for digital media III

CSMI3-02

Objectives:

Know issues, concepts, theories and practices of community management

Skills:

Demonstrating invention and creativity in the use and the management of community tools.
 Using strategic information networks.

Hours:

<u>Lecture:</u>	9
<u>Tutorial Classes:</u>	10.5
<u>Practical work:</u>	12

ECTS: 4

HARDWARE ARCHITECTURE, OPERATING SYSTEMS, NETWORKS
Network Services

CSMI3-03

Objectives:

Interconnect networks and implement services.

Skills:

Administration of systems, software and networks.
 Advice and technical assistance for users, clients and services.
 Preparation of quantitative and qualitative diagnostics, software technical support.

Prerequisite:

Network Architecture and Technology
 Local Networks

Hours:

<u>Lecture:</u>	8
<u>Tutorial Classes:</u>	10
<u>Practical work:</u>	12

ECTS: 4



Spring



Autumn

METHODOLOGY AND PROJECTS
Methodology for the production of applications

CSM13-04

Objectives:
 Analyze the requirements for the design and development of information systems in an organization. Organize and manage a project

Skills:
 Analysis of a computer solution. Technical design of a computer solution. Production of a computer solution.

Prerequisite:
 Knowledge of algorithmics, database, programming, network and system architecture are required to understand this course. Pragmatism and logical thinking are welcome.

Hours:

<u>Lecture:</u>	24
<u>Tutorial Classes:</u>	22
<u>Practical work:</u>	24

ECTS: 6

WEB DEVELOPMENT
Object oriented programming

CSM13-05

Objectives:
 Learn the basics of object oriented programming in the context of web development

Skills:
 Being able to design a multimedia product using OOP

Prerequisite:
 Programming basics, functions

Hours:

<u>Lecture:</u>	3
<u>Tutorial Classes:</u>	9
<u>Practical work:</u>	16

ECTS: 4



Spring



Autumn

WEB, INTERNET, MOBILITY
Server Side Web Programming
(PHP)

CSMI3-06

Objectives:

Know how to develop a server side Web application

Skills:

Technical design of a computer solution.
 Production of a computer solution.
 Preparation of quantitative and qualitative diagnostics, software technical support.

Prerequisite:

Basic knowledge of algorithms and object-oriented programming. Basis of Databases (SQL)

Hours:

<u>Lecture:</u>	12
<u>Tutorial Classes:</u>	14
<u>Practical work:</u>	14

ECTS: 5

WEB, SERVER SIDE PROGRAMMING
LANGAGE, DATABASES, OBJECT
ORIENTED PROGRAMMING
Web development

CSMI3-07

Objectives:

Design dynamic websites, taking care of ergonomics or navigation constraints ; sessions ; introduction to security concepts ; OOP and design patterns

Skills:

Technical design and production of websites

Prerequisite:

being able to create static webpages with html ; having some relational databases knowledge (sql statements), knowing programming bases.

Hours:

<u>Lecture:</u>	1.5
<u>Tutorial Classes:</u>	20
<u>Practical work:</u>	16

ECTS: 5



Spring



Autumn

COMPUTER SCIENCE
Internship/ Professional project in
Computer Science

CSMI5-01

Objectives:
 Internship in a research lab of
 the university.

Skills:
 Software developement in computer
 vision.

Prerequisite:
 Basics in Computer Vision.

ECTS: 6

**ALGORITHMS, PROGRAMMING,
 LANGUAGES, ANALYSIS, DESIGN
 AND DEVELOPMENT OF APPLICA-
 TIONS**

CSMI2-01

Basis of object-oriented program-
 ming

Objectives:
 Develop a program using an ob-
 ject-oriented programming lan-
 guage from a detailed design.

Skills:
 Technical design of a computer solu-
 tion.
 Production of a computer solution.
 Validation tests for a computer solution.

Prerequisite:
 Data Structure and Fundamental Algo-
 rithms in any programming language.

Hours:

<u>Lecture:</u>	10
<u>Tutorial Classes:</u>	20
<u>Practical work:</u>	28

ECTS: 6



Spring



Autumn

ANALYSIS, DESIGN AND APPLICATIONS DEVELOPMENT
Basis of Object-Oriented Design

CSM12-02

Objectives:

To understand and model a detailed design, produce the associated unit tests and implement it with an object-oriented programming language

Skills:

Analysis of a computer solution.
 Technical design of a computer solution
 Production of a computer solution
 Validation tests for a computer solution

Prerequisite:

Basic knowledge of algorithmic and programming skills

Hours:

<u>Lecture:</u>	10
<u>Tutorial Classes:</u>	14
<u>Practical work:</u>	18

ECTS: 5

DIGITAL COMMUNICATION
Writing for digital media II

CSM12-03

Objectives:

Structuring the information (tree structure, contents, sections, links ...),
 Respect the rules of writing for the web,
 Disseminate and communicate information according to the rules in force.

Skills:

Design of an editorial line of publications, contents of messages, communication supports.
 Writing of an editorial charter especially in the case of collaborative writing
 Administrate the content of a website
 Update of the share data and realization of the balance sheet of the communication actions
 Website optimization for SEO

Prerequisite:

The applicant must know (or have a culture of) how to write the webdesign documents of a project: webdesign brief document, personas, wireframes, scenari.

Hours:

<u>Lecture:</u>	4.5
<u>Tutorial Classes:</u>	10.5
<u>Practical work:</u>	8

ECTS: 3



Spring



Autumn

CSM12-04

MATHEMATICS, ALGORITHMS, PROGRAMMING

Graph Theory and Regular language

Objectives:

Know some basic definitions and properties about graphs and automata in order to be able to understand and implement classic algorithms like Dijkstra and simple AI based on automata.

Skills:

Modeling simple problems with graph theory
Production of a computer solution for simple graph problems.

Prerequisite:

Basic knowledge of discrete mathematics (logic, relations) and linear algebra (matrix). Basic knowledge of object programming.

Hours:

<u>Lecture:</u>	10
<u>Tutorial Classes:</u>	16
<u>Practical work:</u>	18

ECTS: 5

CSM12-05

WEB DEVELOPMENT

Development

Objectives:

Learn the basics of PHP

Skills:

Client-server communication, using mysql databases

Prerequisite:

being able to create dynamic pages with php, using forms

Hours:

<u>Lecture:</u>	9
<u>Tutorial Classes:</u>	16
<u>Practical work:</u>	16

ECTS: 5



Spring



Autumn

WEB DEVELOPMENT

Web integration

Objectives:

Learn advanced css and javascript, CMS

Skills:

Creating a website using a CMS; interacting with the DOM; jquery; ajax

Prerequisite:

Basics of html, css and javascript

Hours:

<u>Lecture:</u>	9
<u>Tutorial Classes:</u>	12
<u>Practical work:</u>	20

ECTS : 5

CSM12-06

ENGLISH

Computer Science English

FOR NON-NATIVE SPEAKERS

ECTS: 5

CSM12-07



Spring



Autumn

ENGLISH
Multimedia and Internet English

CSM12-08

FOR NON-NATIVE SPEAKERS

ECTS: 5

APPLIED COMPUTER SCIENCE
Image processing and video analysis

CSM14-01

Objectives:
 Introduction to image processing and computer vision. Understand how to represent and manipulate digital images and videos, understand the principles of compression standards and classical image processing algorithms. The second objective is to provide an introduction and overview of 2 standard tools in image and video processing (Matlab / Scilab, OpenCV).

Skills:
 Image and video compression
 Low level image processing
 OpenCV - Scilab/Matlab

Prerequisite:
 Intermediate level of expertise in C++

Hours:

<u>Lecture:</u>	8
<u>Tutorial Classes:</u>	12
<u>Practical work:</u>	8

ECTS: 4

 Spring

 Autumn

HARDWARE ARCHITECTURE, OPERATING SYSTEMS, NETWORKS, ANALYSIS, DESIGN AND DEVELOPMENT OF APPLICATIONS

Distributed Programming

Objectives:

Program a distributed application.

Skills:

Production of a computer solution.
Validation tests for a computer solution.
Operation and maintenance of a computer application.

Prerequisite:

Knowledge in Networks Protocols (IP, TCP). Knowledge of algorithms and object-oriented programming.

Hours:

<u>Lecture:</u>	8
<u>Tutorial Classes:</u>	12
<u>Practical work:</u>	8

ECTS: 4

CSM14-02

WEB PROGRAMMING

Rich clients

Objectives:

Know and use web technologies to develop rich client side interfaces for web applications.

Skills:

Client side Web Languages
Web technologies (Ajax, Canvas, WebGL, WebAssembly)
Node.js

Prerequisite:

HTML, CSS (PHP)

Hours:

<u>Lecture:</u>	4
<u>Tutorial Classes:</u>	12
<u>Practical work:</u>	8

ECTS: 4

CSM14-03



Spring



Autumn

WEB, INTERNET, MOBILITY

Design and development of mobile applications

Objectives:

Learn how to develop applications on mobile devices.

Skills:

Technical design of a computer solution.

Production of a computer solution.

Prerequisite:

Human-Machine interface, object-oriented programming

Hours:

<u>Lecture:</u>	8
<u>Tutorial Classes:</u>	12
<u>Practical work:</u>	8

ECTS: 4

CSMI4-04

COMPUTER SCIENCE

Internship / Professional project in Computer Science

Objectives:

Internship in a research lab of the university

Skills:

Software development in computer vision

Prerequisite:

Basis in Computer Vision

Hours:

<u>Lecture:</u>	9
<u>Tutorial Classes:</u>	16
<u>Practical work:</u>	16

ECTS: 6

CSMI6-01



Spring



Autumn