ICT Complementary Course
(S6 and S7 – 2 periods per week)

Objectives

Digital technologies play a central role in the modern world, not only in scientific and technical fields, but across almost all areas of society, education and professional activity.

This course aims to develop students' digital literacy, computational thinking and problem-solving skills, while giving them a concrete understanding of how modern digital systems are designed, programmed and interconnected.

Students will explore several key domains of informatics through practical activities and project-based work, allowing them to deepen their autonomy, creativity and analytical skills.

Main Areas of Study

1. Object-Oriented Programming
(Java or Python)

- Fundamental concepts: classes, objects, attributes, methods.
- Algorithmic thinking, modular design, debugging and code readability.
- Introduction to software structure and basic good practices.

2. Advanced Web Development
(HTML, CSS, JavaScript – with or without WYSIWYG tools)
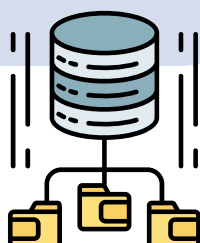
- Structure and semantics of web pages (HTML).
- Layout, styling and responsiveness (CSS).
- Basic interactivity and dynamic behaviour (JavaScript).
- Possibility to use visual editors as support, or to work directly in code.

3. Databases and Data Management
(SQLite, Python, SQL)

- Database modelling and structure.
- Introduction to SQL queries (selection, filtering, sorting, joins).
- Interaction between Python programs and databases.
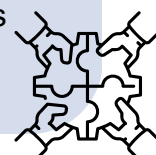- Basic principles of database management systems.

4. Project Work

Students will carry out a substantial project, depending on their interests and prior competences, for example:

- a complete website,
- a robotics or automation project,
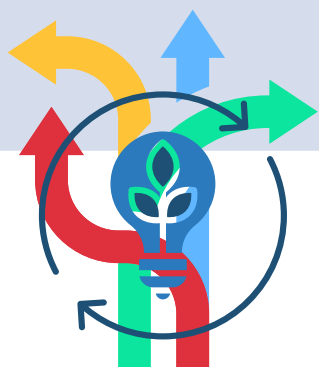- graphical or video production projects.

Projects are proposed and guided by the teacher in order to ensure pedagogical coherence, feasibility and an appropriate academic level. The project integrates planning, implementation, testing, documentation and presentation.

Flexibility

In addition to the core topics above, a certain degree of flexibility is offered by the school syllabus in order to adapt the content and depth to the profile, competences and aspirations of each group of students.

The content of the course is therefore adapted to students' previously acquired competences and skills. Assessment is aligned with the topics effectively covered and the activities carried out during the course.

Teaching Methods and Resources

Activities are organised individually or in small teams, with a strong emphasis on hands-on experimentation, problem solving and project-based learning.

ICT rooms are equipped with modern PCs and the necessary software.

Depending on the group and available time, this flexibility may allow the inclusion of additional thematic modules, for example an introductory networking module (basic concepts of computer networks and Internet architecture), or graphics and video production, according to students' interests and competences

Assessment

- ○ **A mark** is based on continuous assessment, including practical activities, assignments and project work.
- ○ **B mark** is based on written and/or computer-based tests covering the main concepts studied.

Prerequisites

Previous ICT courses (S4–S5) are not strictly required; however, a solid interest in digital technologies, logical reasoning and autonomous work is strongly recommended.

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