# CLIL Module Plan

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| **School** | ITT Buonarroti Pozzo Trento | | | | |
| **School Grade** | ○ Primary | | ○ Middle | | ◉ High |
| **School Year** | ○ 1 | ○ 2 | ◉ 3 | ○ 4 | ○ 5 |
| **Subject** | Informatica | **Topic** | Study of HDD structure, Scheduling algorithms and RAID architecture | | |
| **CLIL Language** | ◉ English | | ○ Deutsch | | |

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| **Personal and social-cultural preconditions of all people involved** | The ITT “M. Buonarroti” Trento is a school that, over a period of five years, trains technicians in a variety of specializations: electro technical, mechanical, chemical, IT. Our technicians can immediately face the labour market in industry or public offices or continue with university studies. In general, the degree of motivation for the study of our students is not very high. In some classes the presence of foreign students is relevant and on average in each class there is a student with special educational needs. I hope that the lessons and teaching activities conveyed in English increase the interest and motivation towards the chosen specialization. In this particular class 3° Informatics C the average level of knowledge of the English language of the students can be assessed in level A2, with a couple of student at B1 level. |

| Students' prior knowledge, skills, competencies | Subject | Language |
|---|---|---|
| | Computer Architecture, PC Operating Systems Architecture, Memory Management, Process Management, binary and hexadecimal numbering system | Classroom language: students should be able to understand simple sentences containing the explanation of the electronic device components under examination, as well as to understand the explanation of the functions and algorithms used to manage them. They also must be able to ask for help or for clarifications. Skills: throughout the module students will be asked to independently repeat the concepts learned in order to strengthen and consolidate their understanding. They should also be able to quickly find on the Internet, read and understand the technical characteristic of the mass storage devices examined, and of the most RAID configurations. The grammatical level required is about A2. Vocabulary: most of the technical words used in the module are generally of immediate comprehension for students of IT specialization. |

| Timetable fit | ◉ Module | Length 20 h |
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| **Description of teaching and learning strategies** | The teacher’s role will be to introduce the topic of the lesson, to motivate its importance and proceed with the explanation, with the necessary precision and conciseness, urging the students to ask for clarification as soon as they find some difficulty in understanding some word, or mathematical passages. Student will be asked to carry out together with the teacher the exercises for the consolidation of the concepts learned and also the domestic ones, which will be carried out together the next lesson. During the theoretical lessons, where the students will learn about the argument of the module, all will speak only in English and the students in difficulty with the language will be invited to find help each other to formulate correctly in English their requests. The basic tool will be the IWB board with the projector, while the whiteboard will be used in some moments for more specific tasks or clarifications, like mathematical passages and sometimes explanatory phrases in English that summarize certain concepts. The use of dynamic presentations projected on the IWB, with the integration of steps on the blackboard aside, promotes a very effective understanding of the topics, and allows students to take notes with greater convenience. Sometimes students will be invited to consult on the Internet, using their smartphones, the technical manuals of the device under examination, or to search for technical data, to proceed independently to perform the tasks assigned. This module of lessons does not foresee a laboratory activity, but it tries however to incentivize the reasoning and the practical activity of the students, on the topics dealt with. The activity of "group" is encouraged but everyone must therefore develop their own personal system, also in view of the test in which each student will be assessed individually for the work performed. There will be all one-hour lessons due to the scheduled times for the class. The lessons will be used for the explanation of new |

# Overall Module Plan

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| **Unit:** 1<br>Mass storage and HDD<br>**Unit length:** 20 h | **Lesson 1**<br>Computer system architecture and common operating systems |
| | **Lesson 2**<br>Common mass storage devices Cost versus dimension |
| | **Lesson 3**<br>History of technology |
| | **Lesson 4**<br>Hard disk physical interfaces and performance |
| | **Lesson 5**<br>Magnetic disk and head |
| | **Lesson 6**<br>Hard disk hardware, disk data organization |
| | **Lesson 7**<br>Formatting – Addressing data on disk |
| | **Lesson 8**<br>Hard disk timing |
| | **Lesson 9**<br>Scheduling algorithms – FIFO and SSTF |
| | **Lesson 10**<br>Exercises on Scheduling Algorithms |
| | **Lesson 11**<br>Scheduling algorithms – SCAN, C-SCAN |
| | **Lesson 12**<br>Scheduling algorithms – LOOK, C-LOOK, N-SCAN, F-SCAN |
| | **Lesson 13**<br>Scheduling algorithms – Group exercises - homework |

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| | **Lesson 14**<br><br>Introduction to RAID technology |
| | **Lesson 15**<br><br>RAID Levels : Level 0, 1 and 2 |
| | **Lesson 16**<br><br>RAID Levels : Level 2 and 3 |
| | **Lesson 17**<br><br>RAID Levels : Level 4, 5, 6 and 7 |
| | **Lesson 18**<br><br>Review of topics in preparation for the verification test on mass storage and HDD. |
| | **Lesson 19**<br><br>Verification test on mass storage and HDD |
| | **Lesson 20**<br><br>Delivery of the evaluated tests and collegial correction |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 1 | **Title** | Computer system architecture and common operating systems |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 25 min | To know: - How is organized a computer architecture | T. introduce the argument as a refresh of student knowledge. S. has to check individually some technical terms with the corresponding definitions. At the end S. group themselves by 2 or 3 and check they answers. Finally they expose their results to the T. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Computer, architecture, CPU (Central Processing Unit), HD (Hard Disk), Bus, Controller<br>**Communicative structures**<br>Do you remember..? What's the meaning of.. ? There I can find.. ? Which word corresponds to.. ? | ☐ Whole class<br>☑ Group work<br>☐ Pair work<br>☑ Individual work | • U1_L1.zip<br>PPT Presentation L1 – Activity 1 sheet for students and teacher | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest Autonomy |

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| 2 | 25 min | To know: - Which Operating Systems exists? - Which O.S. do you usually use? | The teacher introduces activity 2 giving the definition of O.S. and making students think about where they could find an O.S. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Operating Systems<br>**Communicative structures**<br>Which O.S,. do you know? Does your smarphone has an O.S.? | ☐ Whole class<br>☒ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L1.zip<br>PPT Presentation L1 – Activity 2 sheet for students and teacher | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest Autonomy Innovative idea Cooperativity |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 2 | **Title** | Common mass storage devices Cost versus dimension |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 5 min | To focus on: - what's a mass storage device? - which mass storage devices do you know? | The teacher introduces the topic of mass storage, asking students what devices they know, and what kind of memory they use | **Skills**<br>L S R W<br>**Key vocabulary**<br>Mass storage, Memory<br>**Communicative structures**<br>What kind of mass storage.. ? You USB key is..? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L2.zip<br>PPT Presentation | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Interest |

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| 2 | 25 min | To know: - Which mass storage devices does exist. | The teacher introduces activity 1 where students have to search on internet about mass storage devices. At the end of the established time, the students expose the results they have found | **Skills**<br>L S R W<br>**Key vocabulary**<br>Mass storage<br>**Communicative structures**<br>Which mass storage does exists? Do you know..? | ☐ Whole class<br>☒ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L2.zip<br>PPT Presentation L2 – Activity 1 sheet for students | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |
| 3 | 20 min | To know: - How much a mass storage does it cost? - How much is the dimension versus price ration? Be able to: - Search for technical information on the Internet | The teacher introduces the topic by asking questions to the students, and then inviting them to carry out the research activity on the internet | **Skills**<br>L S R W<br>**Key vocabulary**<br>Mass storage, price versus dimension<br>**Communicative structures**<br>How much does it cost? What is the size of this device? | ☐ Whole class<br>☒ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L2.zip<br>PPT Presentation L2 – Activity 2 sheet for students | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 3 | **Title** | History of technology |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 10 min | To know: - some information about the history of storage technology | The teacher introduces some notions about the history of technology, referring to articles published on the internet | **Skills**<br>L S R W<br>**Key vocabulary**<br>History, Memory, Timeline, Technology<br>**Communicative structures**<br>When was.. ? How much.. ? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L3.zip<br>PPT Presentation<br>link link link | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Interest |

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| 2 | 40 min | Be able to: - Read an article - Fill the gaps with the right words - Understand the article content and answer some closed questions | The teacher introduces activity 1 and 2 where students have to read and answer. At the end of the established time, the students expose their answer | **Skills**<br>L S R W<br>**Key vocabulary**<br>History, Memory, Timeline, Technology<br>**Communicative structures**<br>When was.. ? How much.. ? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☒ Individual work | • U1_L3.zip<br>PPT Presentation L3 – Activity 1 and 2 sheet for students and teacher link | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 4 | **Title** | Hard disk physical interfaces and performance |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 20 min | To focus on: - kinds of mass storage device - which physical connectors exist for mass storage | The teacher explains the different types of mass storage. After giving the definition of electrical connector, it shows the list of existing connectors for mass storage, also using documents published on the internet. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Mass storage, Physical interface, Electrical connector<br>**Communicative structures**<br>Which kind of interface do you know? Which kind of interface is faster? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L4.zip<br>PPT Presentation<br>link link | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Interest |

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| 2 | 30 min | To know: - Which mass storage devices does exist. | The teacher assigns students a research to do on the internet with their smartphone on the most used connectors on mass storage. Using the prepared sheets, the students perform the search and then expose the results. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Mass storage, Interface, Transfer Rate, Size<br>**Communicative structures**<br>Which size is .. ? How much fast does it go? | ☐ Whole class<br>☒ Group work<br>☐ Pair work<br>☒ Individual work | • U1_L4.zip<br>PPT Presentation L4 – Activity 1 and 2 sheet for students | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 5 | **Title** | Magnetic disk and head |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 50 min | To focus on: - kinds of mass storage device - which physical connectors exist for mass storage | After a general introduction on the hard disks, it is explained in detail how a magnetic disk is made and how the information is stored. In the second part the characteristics of the head used to read and write the information are discussed | **Skills**<br>L S R W<br>**Key vocabulary**<br>Magnetic disk, platter, aluminum, double-sided, head, inductive, magneto resistive, nanometer<br>**Communicative structures**<br>What is .. ? How it works? How it's used for.. ? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L5.zip<br>PPT Presentation link | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 6 | **Title** | Hard disk hardware, disk data organization |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 35 min | To know: - the internal structure of an hard disk - the data organization on a magnetic disk surface | The teacher takes up the new concepts presented in the last lesson, asking questions to the students who answer in L2. The organization of the internal structure of a hard disk is exposed. The organization of data on the surface of a magnetic disk is then analyzed in detail. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Platter, spindle, arm, rotation, head, sector, track, cylinder, cluster<br>**Communicative structures**<br>Do you remember.. ?<br>What we use for..? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L6.zip<br>PPT Presentation | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Interest |

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| 2 | 15 min | Be able to: - How to search technical data on internet. - How to calculate the disk dimension | Students perform a search on the internet for the characteristics of some magnetic disks. Then they perform the calculation of the physical dimension of a magnetic disk starting from the physical parameters | **Skills**<br>L S R W<br>**Key vocabulary**<br>Platter, spindle, arm, rotation, head, sector, track, cylinder, cluster<br>**Communicative structures**<br>How many.. does it have? Which is the dimension of.. ? | ☐ Whole class<br>☒ Group work<br>☐ Pair work<br>☒ Individual work | • U1_L6.zip<br>PPT Presentation L6 – Activity 1 sheet for students | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 7 | **Title** | Formatting – Addressing data on disk |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 50 min | To know: - CHS addressing in magnetic disks - L-CHS addressing - LBA and LBA48 addressing | In the first part the teacher reviews the concepts introduced in the last lesson, asking questions to the students who answer in L2. The teacher then introduces the concept of formatting and addressing in magnetic disks, using sectors, cylinders and heads. After having exposed the limitations given by the BIOS, we pass to the LBA and LBA48 addressing system, which is the one currently used | **Skills**<br>L S R W<br>**Key vocabulary**<br>Magnetic disk, formatting, head, cylinder, sector, addressing, BIOS<br>**Communicative structures**<br>Try to.. ? What does it means? It’s different from..? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L7.zip<br>PPT Presentation | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 8 | **Title** | Hard disk timing |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 50 min | To know: - CHS addressing in magnetic disks - L-CHS addressing - LBA and LBA48 addressing Be able to: - Read a technical datasheet | In the first part the teacher reviews the concepts introduced in the last lesson, asking questions to the students who answer in L2. The teacher then introduces the concept of timing into magnetic disks. The four characteristic times of magnetic disks are analyzed, explaining their origin. A technical datasheet is presented in order to check out the characteristic times. As a small final check an oral quiz is placed to the students to verify their understanding of the topics. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Seek Time, Latency Time, Access Time, Transfer Time<br>**Communicative structures**<br>How many time.. ? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L8.zip<br>PPT Presentation DT01ACA Datasheet | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 9 | **Title** | Scheduling algorithms – FIFO and SSTF |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 50 min | To know: - Scheduling algorithms - Motivations of algorithms - FIFO and SSTF algorithms | In the first part the teacher reviews the concepts introduced in the last lesson, asking questions to the students who answer in L2. The scheduling topic is introduced explaining the motivations for which algorithms are needed. The FIFO and SSTF algorithms are exposed, explaining the characteristics of each and their functioning, using animations in the presentation. For each algorithm a cost is associated, which will be used as a comparison method with all the other algorithms. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Scheduling, Wasted, Queue, Algorithm, Efficient, Strategy, Processing<br>**Communicative structures**<br>Why.. ? How many times.. ? Which is the best.. ? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L9.zip<br>PPT Presentation | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 10 | **Title** | Exercises on Scheduling Algorithms |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 25 min | To know: - How the FIFO algorithm works - How the SSTF algorithm works Be able to: - Apply scheduling algorithm to practical cases | The teacher takes up the new concepts presented in the last lesson, asking questions to the students who answer in L2. An exercise on the FIFO algorithm and one on the SSTF one is proposed to the class. In the end the results are exposed by the whole class for a common feedback. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Queue, FIFO, SSTF, Algorithm<br>**Communicative structures**<br>Who want to.. ? Which is the best..? What is the next one? | ☒ Whole class<br>☐ Group work<br>☒ Pair work<br>☐ Individual work | • U1_L10.zip<br>PPT Presentation L10 – Activity 1 sheet for students and for teacher | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

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| 2 | 25 min | To know: - How the SSTF algorithm works | Two similar exercises are proposed to the class on the SSTF algorithm with the modification of the waiting queue at mid-processing in the second case. In the end the results are exposed by the whole class for a common feedback. | **Skills**<br><br>L S R W<br><br>**Key vocabulary**<br>Queue, FIFO, SSTF, Algorithm<br><br>**Communicative structures**<br>Who want to.. ? Which is the best..? What is the next one? | ☒ Whole class<br>☐ Group work<br>☒ Pair work<br>☐ Individual work | • U1_L10.zip<br><br>PPT Presentation L10 – Activity 2 sheet for students and for teacher | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 11 | **Title** | Scheduling algorithms – SCAN, C-SCAN |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 50 min | To know: - Scheduling algorithms - SCAN and C-SCAN algorithms - Differences between the algorithms | In the first part the teacher reviews the concepts introduced in the last lesson, asking questions to the students who answer in L2. We move forward analyzing a new algorithm, the SCAN. Its progress is compared to an elevator and its advantages in its simplicity are studied. We then move on to the C-SCAN, which with its circular run, removes some defects of the SCAN. The lesson ends with a brief summary on the algorithms dealt with so far. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Scheduling, Queue, Algorithm, Efficient, Strategy, SCAN, Elevator, C-SCAN, Circular, Round Robin<br>**Communicative structures**<br>Why.. ? How many times.. ? Which is the best.. ? | ☑ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L11.zip<br>PPT Presentation | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 12 | **Title** | Scheduling algorithms – LOOK, C-LOOK, N-SCAN, F-SCAN |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 50 min | To know: - Scheduling algorithms - SCAN and C-SCAN algorithms - LOOK and C-LOOK algorithms - Differences between SCAN and LOOK | In the first part the teacher reviews the concepts introduced in the last lesson, asking questions to the students who answer in L2. Students are asked what possible improvements we can make to the algorithms we have seen so far. The discussion is open to the students for some ideas. The LOOK and C-LOOK algorithms are then analyzed, which improve the respective SCAN and C-SCAN. Finally, the N-SCAN and F-SCAN algorithms are introduced as special versions of the SCAN algorithm. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Scheduling, Queue, Algorithm, Efficient, Strategy, Look forward, LOOK, C-LOOK, SCAN, C-SCAN, N-SCAN, F-SCAN<br>**Communicative structures**<br>Any idea for.. ?<br>Something better?<br>What if we.. ? | ☑ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L12.zip<br>PPT Presentation | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 13 | **Title** | Scheduling algorithms – Group exercises - homework |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 10 min | To know: - Why we need scheduling algorithms - Different kinds of algorithms - Which is the best one in general | The teacher present a brief summary of the scheduling algorithms, from the initial movements, to the various types of algorithms analysed, asking questions to the students who answer in L2. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Algorithm<br>**Communicative structures**<br>What is.. ? Which is the best..? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L13.zip<br>PPT Presentation | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

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|---|---|---|---|---|---|---|---|
| 2 | 40 min | To know: - How the scheduling algorithm works Be able to: - Apply scheduling algorithm to practical cases | The teacher proposes to the class to perform exercises on the algorithms studied in the classroom. The work will be done in small groups. Only the first exercise is to be carried out, and then the results will be analyzed together. The following exercises will have to be started in class and then completed individually at home. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Scheduling algorithm, FIFO, SCAN, LOOK, C-SCAN, C-LOOK<br>**Communicative structures**<br>Who want to.. ? Which is the best..? What is the next one? | ☐ Whole class<br>☒ Group work<br>☐ Pair work<br>☒ Individual work | • U1_L13.zip<br>PPT Presentation L13 – Activity 1 sheet for students and for teacher | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 14 | **Title** | Introduction to RAID technology |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 50 min | To know: - What is RAID - What is Disk Interleaving - What is Disk Mirroring - What is Reliability | In the first part the teacher reviews the concepts introduced in the last lesson, asking questions to the students who answer in L2. The teacher introduces the new term RAID, which stands for Redundant Array of Independent Disks. It is a new technology created to compensate for the slowness of mass storage devices compared to the increasing speeds of computers. We use more magnetic disks, connected in an appropriate way, to increase the efficiency of the system. Interleaving and Mirroring techniques are used to improve performance and reliability. Finally, the various levels provided by the RAID are briefly introduced. | **Skills**<br>L S R W<br>**Key vocabulary**<br>RAID, Redundant, Independent, Array, Interleaving, Mirroring, Reliability<br>**Communicative structures**<br>Why.. ? How many times.. ? Which is the best.. ? | ☑ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L14.zip<br>PPT Presentation | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 15 | **Title** | RAID Levels : Level 0, 1 and 2 |
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| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 50 min | To know: - What is RAID - What is Striping - What is Disk Mirroring | In the first part the teacher reviews the concepts introduced in the last lesson, asking questions to the students who answer in L2. The teacher explains the characteristics of RAID level 0 called striping. To facilitate learning, drawings and animations are used to explain how the technique works. The main parameters of level efficiency and its peculiarities are then identified. The same is then done for level RAID 1 called mirroring. | **Skills**<br>L S R W<br>**Key vocabulary**<br>RAID, Interleaving, Mirroring, Striping, Fault tolerance, Efficiency, MTBF<br>**Communicative structures**<br>Why.. ? Who remember.. ? Which is the efficiency of.. ? | ☑ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L15.zip<br>PPT Presentation | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 16 | **Title** | RAID Levels : Level 2 and 3 |
|---|---|---|---|---|---|

| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 20 min | To know: - RAID - RAID level 0 - RAID level 1 Be able to: - Apply RAID level 0 and 1 to practical cases | In the first part the teacher reviews the concepts introduced in the last lesson, asking questions to the students who answer in L2 The teacher offers a short written exercise, to be done in pairs, to confirm the concepts learned for RAID 0 and RAID 1. | **Skills**<br>L S R W<br>**Key vocabulary**<br>RAID, Interleaving, Levels, Striping, Mirroring<br>**Communicative structures**<br>What is.. ? Do you remember.. ? | ☐ Whole class<br>☐ Group work<br>☑ Pair work<br>☐ Individual work | • U1_L16.zip<br>PPT Presentation L16 – Activity 1 sheet for students and for teacher | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2 | 30 min | To know: - RAID Level 2 - RAID Level 3 - Bit Striping - Hamming Code - Parity | The teacher explains the characteristics of RAID level 2 called bit striping with Hamming Code. To facilitate learning, drawings and animations are used to explain how the technique works. The main parameters of level efficiency and its peculiarities are then identified. The same is then done for level RAID 3 called Byte striping with parity | **Skills**<br>L S R W<br>**Key vocabulary**<br>RAID, Bit Striping, Parity, Hamming Code, Fault tolerance, Efficiency, MTBF<br>**Communicative structures**<br>Why.. ? Who remember.. ? Which is the efficiency of.. ? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L16.zip<br>PPT Presentation | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 17 | **Title** | RAID Levels : Level 4, 5, 6 and 7 |
|---|---|---|---|---|---|

| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 50 min | To know: - What is RAID - What is Striping - What is Disk Mirroring | In the first part the teacher reviews the concepts introduced in the last lesson, asking questions to the students who answer in L2. The teacher continues his exposure by introducing the characteristics of RAID level 4 called block striping with parity. To facilitate learning, drawings and animations are used to explain how the technique works. The main parameters of level efficiency and its peculiarities are then identified. The same is then done for level RAID 5 called block striping with distributed parity, and for level RAID 6 called block striping with double distributed parity. At the end some notions on the RAID 7 level and on the nested levels are briefly illustrated. | **Skills**<br>L S R W<br>**Key vocabulary**<br>RAID, Parity, Distributed Parity, Fault tolerance, Efficiency, MTBF<br>**Communicative structures**<br>Why.. ? Who remember.. ? Which is the efficiency of.. ? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L17.zip<br>PPT Presentation | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 18 | **Title** | Review of topics in preparation for the verification test on mass storage and HDD. |
|---|---|---|---|---|---|

| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 50 min | To review:<br>- All the topics of the module | The teacher offers a review of all the topics covered in this form. Students are invited to speak for any questions to clarify any doubts. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Review, module<br>**Communicative structures**<br>Why.. ? Who remember.. ? What is.. ? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L18.zip<br>PPT Presentation | Formative assessment, self-assessment and ongoing assessment:<br>T. and S. check:<br>Knowledge<br>Participation<br>Collaboration<br>Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 19 | **Title** | Verification test on mass storage and HDD |
|---|---|---|---|---|---|

| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 50 min | Be able to: - Solve the questions proposed in the verification test | Give the verification test to the students. | **Skills**<br>L S R W<br>**Key vocabulary**<br>Verification test<br>**Communicative structures**<br>Read carefully.. When you finished it, read it again.. | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L19.zip<br>L19 – Verification test | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |

# CLIL Lesson Plan

| **Unit number** | 1 | **Lesson number** | 20 | **Title** | Delivery of the evaluated tests and collegial correction |
|---|---|---|---|---|---|

| **Activity** | **Timing** | **Learning Outcomes** | **Activity Procedure** | **Language** | **Interaction** | **Materials** | **Assessment** |
|---|---|---|---|---|---|---|---|
| 1 | 50 min | To understand: - if I answered correctly - if I studied well - If the students are satisfied | Give the test results to the students, and carry out the verification together for a better understanding of their mistakes | **Skills**<br>L S R W<br>**Key vocabulary**<br>Verification test<br>**Communicative structures**<br>Did you answer correctly? What did you answer? | ☒ Whole class<br>☐ Group work<br>☐ Pair work<br>☐ Individual work | • U1_L20.zip<br>L20 – Verification test | Formative assessment, self-assessment and ongoing assessment: T. and S. check: Knowledge Participation Collaboration Interest |