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## Summary of implemented courses

### 1 Introduction and motivation

The main objective of this document is to present a short summary of the implemented courses for the ErasmusX project and the obtained results.

In particular, ErasmusX consists of four universities, with three types of online platforms, and three main areas of expertise in which the courses can be classified. The background of these courses, professors and institutional implementation are very heterogeneous: some courses were created from scratch, while a few ones were polished versions of already existing courses, for instance. Additionally, some of the courses received several Erasmus+ students to try them once implemented, while others could not receive any, even after they were institutionally and officially announced and offered to all incoming Erasmus+ students. Finally, the COVID-19 pandemic situation changed the “playground” a bit more.

For this reason, the consortium agreed to compile a set of reports for each of the implemented courses following a simplified template.

### 2 Report template

As previously mentioned, due to the heterogenous nature of the different courses, the report was thought as a short reflection about each of them and consisted of three main items (together with the description below):

#### 2.1 Context of the course

*Briefly explain its contents (summary), number of ECTS credits, area/field, if it already exists/existed in some of your University degrees, etc.*



## 2.2 Implementation

*What was implemented and why (videos, documents, synchronous classes, etc.)*

## 2.3 Results

*Expected results and actual results (number of students, surveys, etc.)*

Apart from these three items, we also asked partner Universities to provide screenshots and proofs in their reports.

This template was expected to be a reference of the minimum content that each report should provide, but it was not mandatory and more information could also be included (if meaningful). Our intention was to provide a light and summarized overview of the implemented courses, so that future similar projects could quickly sketch some of the ideas and results.

## 3 Overview and conclusions

After examining the different course implementations, we can observe a set of common characteristics:

- For all four Universities, the amount of implemented courses is between 5 and 10. This makes sense as the expected amount of ECTS to be delivered was 27 ECTS, and the guidelines of implementation recommended a duration of the courses between 2 a 6 ECTS each (and no more than 6 ECTS to guarantee flexibility of contents).
- Most of the implemented material was written (either as documents or presentations), but visual content was considered key. For that reason, it can be observed that many courses linked videos and multimedia content from related sources, and some even developed their own recorded content.
- All Universities generally mixed asynchronous and synchronous content in their courses.
- Many of the courses had a specific (and visual) presentation of the professors/staff delivering the course. This is important to connect with the audience (i.e. students).
- All Universities agree that COVID-19 completely changed the approach to implement and deliver the courses, both positively (e.g., more tools and resources available) and negatively (e.g., fewer Erasmus+ students)
- Several Universities mentioned how their institutions are currently fostering online course development, as it is considered a cornerstone of future Higher Education, and how ErasmusX served as a pilot for these ideas.

It is also worth mentioning that three different platforms were used for the implementation (Blackboard, Federica and Moodle), as planned by the project proposal and decisions in IO1 during project execution. Additionally, some more tools are mentioned (like Genially or Wooclap). Furthermore, one course was developed with a particular focus on technological accessibility. Finally, several of the courses are from the engineering field and they mention the importance of having additional customized tools like laboratory simulators.

## 4 Document structure

In the following four Annexes, we provide a description of a selected set of courses implemented by each partner University of ErasmusX. More specifically, the order and the amount of courses described per institution are:

- University of Alcalá (UAH) – 8 courses
- University of Napoli Federico II (UNINA) – 4 courses
- Lodz University of Technology (TUL) – 3 courses
- University of Latvia (UL) – 2 courses



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## Annex 1. Summary of implemented courses

University of Alcala (UAH)

## UAH COURSE #1

# ENGLISH FOR TOURISTIC BUSINESS

2 ECTS

Prof. Soraya Garcia - [Soraya.garciae@uah.es](mailto:Soraya.garciae@uah.es)



### INDEX

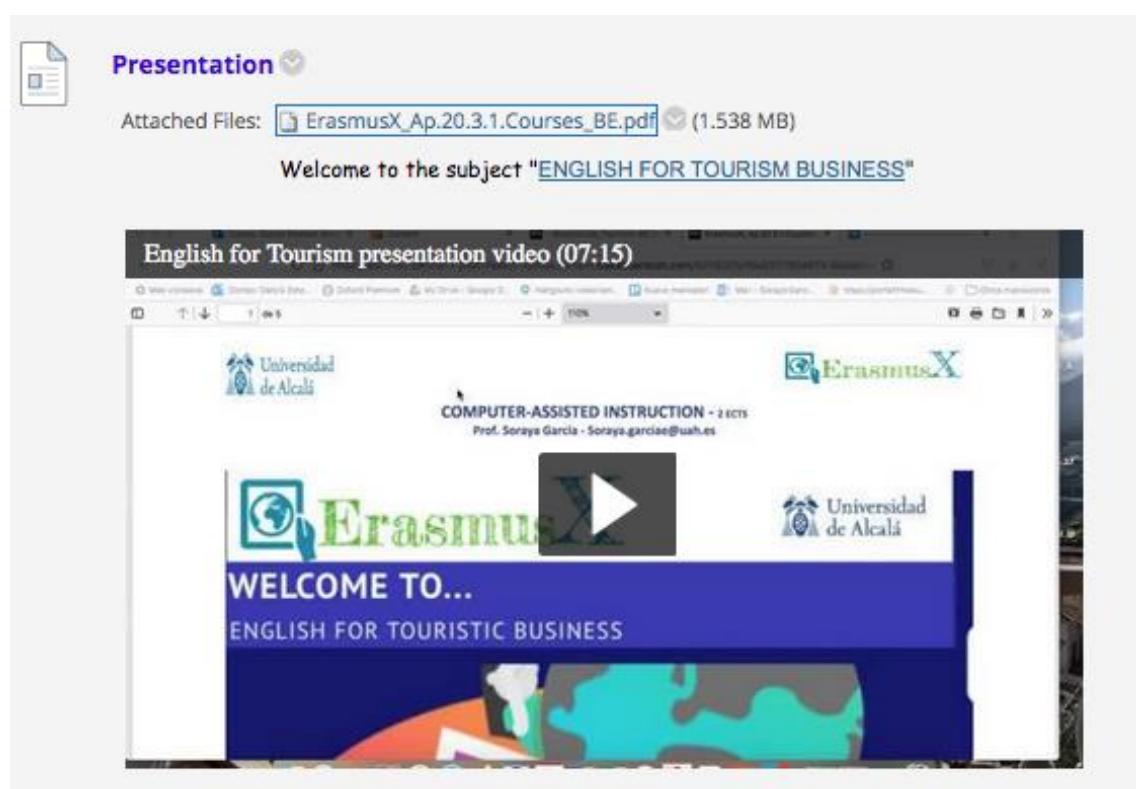
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¡ERROR! MARCADOR NO DEFINIDO.

### 1. IMPLEMENTATION

The subject ENGLISH FOR TOURISTIC BUSINESS is offered by the Department of Modern Philology face to face in the Double Degree of Tourism and the Double degree in *Tourism* and

*Business Administration and Management.* The program is specified in the Study Guide. The course offered to ErasmusX students has been adapted to be delivered online following Addie's instructional design model through the institutional platform Blackboard, which includes a discussion forum. Along the course, students are required to use collaborative social media such as videos and the use of web apps. for revising specialized contents. The course includes an introductory video in which the tutor explains the contents and structure of the subject (image 1).



4.1

Image 1. Illustration of a video in which the tutor explains the contents

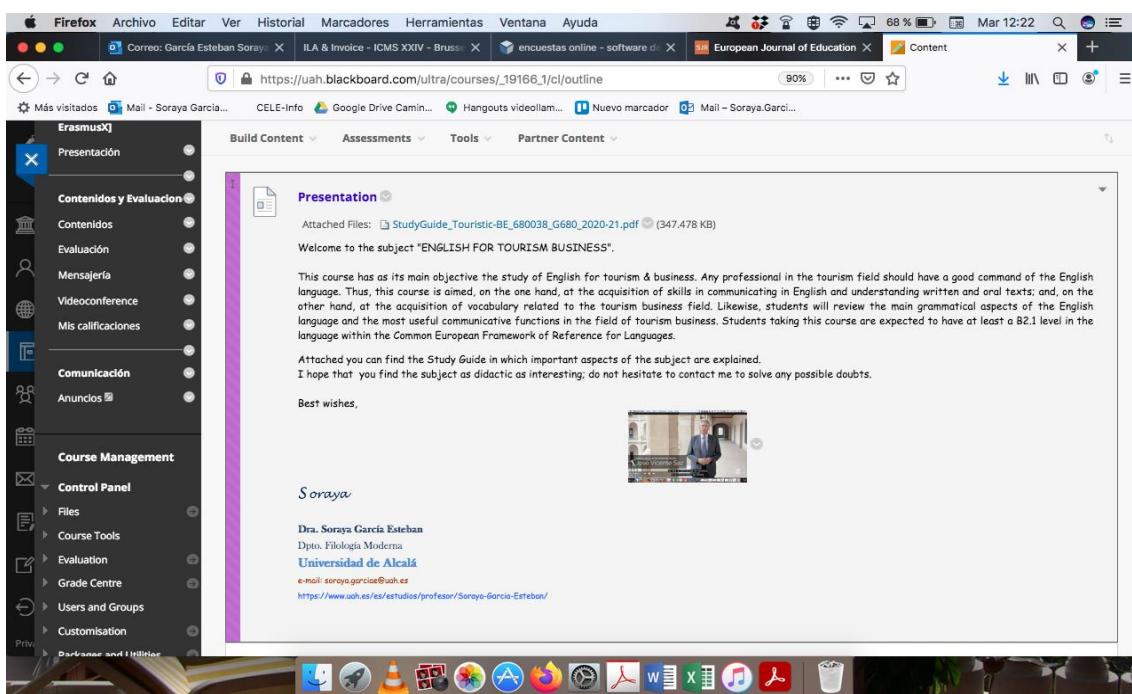


The image shows a screenshot of a Blackboard course navigation bar. It features the Universidad de Alcalá logo, the ErasmusX logo, the course title "COMPUTER ASSISTED INSTRUCTION", the year "YEAR 2020/21", and navigation icons for home and menu. The "INTRODUCTION" tab is highlighted in blue, indicating the current section. There are also back and forward arrows for navigating through the course content.

## 2. INTRODUCTION

This course has as its main objective the study of English for tourism & business with a good command of the English language. Thus, this course is aimed, on the one hand, at the acquisition of skills in communicating in English and understanding written and oral texts;

and, on the other hand, at the acquisition of vocabulary related to the tourism business field. Likewise, students will review the main grammatical aspects of the English language and the most useful communicative functions in the field of tourism business. Students taking this course are expected to have at least a B2.1 level in the language within the Common European Framework of Reference for Languages. In the course, students can find an introduction with the Study Guide in which important aspects of the subject are explained as detailed in image 2.



The screenshot shows a Firefox browser window displaying a Blackboard course page. The URL is https://uah.blackboard.com/ultra/courses/\_19166\_1/cl/outline. The page title is 'Presentation'. On the left, there is a vertical navigation menu under the heading 'ErasmusX1' with sections like 'Presentación', 'Contenidos y Evaluación', 'Contenidos', 'Evaluación', 'Mensajería', 'Videoconferencia', 'Mis calificaciones', 'Comunicación', and 'Anuncios'. The main content area contains a text block with a welcome message, a study guide attached (StudyGuide\_Touristic-BE\_680038\_G680\_2020-21.pdf), and a video thumbnail of a professor speaking. Below the video, there is contact information for the professor, Soraya García Esteban, including her title (Dra.), degree (Dpto. Filología Moderna), university (Universidad de Alcalá), email (soraya.perez@uah.es), and a link to her profile (https://www.uah.es/es/estudios/profesor/Soraya-Garcia-Esteban/).

Image 2. introduction and Study Guide in which important aspects of the subject are explained

The course contains an index where all the contents of the course can be found. Each item is listed in the institution platform Blackboard as appears in Image 3.



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The screenshot shows the course index page. At the top left is the Universidad de Alcalá logo and the ErasmusX logo. To the right are the text "COMPUTER ASSISTED INSTRUCTION" and "YEAR 2020/21", along with a house icon and a menu icon. The main title "INDEX" is at the top of the content area. Below it are six menu items arranged in two columns of three: "INTRODUCTION", "RESOURCES", "EVALUATION", "FORUM", "CONTENTS", and "THANK YOU!". To the right of the menu is a circular illustration of four stylized figures (two men, two women) working together around a large computer monitor on a desk.

Image 3. Course Index

### 3. CONTENT DESIGN & DEVELOPMENT

The contents are presented specifying and adapting the sequence and organization to the institutional learning platform. They have been designed taking into account different methodological approaches following Garcia Esteban (2017) and Garcia et al. (2020).

The creation and production of the content and materials of the course have been designed to be taught online using open content resources (i.e web based videos, power presentations, online book, etc.) and includes collaborative social media and a class forum where students and tutor can share ideas and interact. One example of how contents are delivered in each unit is illustrated in the images bellow (Images 6-).

The screenshot shows the contents page. At the top left is the Universidad de Alcalá logo and the ErasmusX logo. To the right are the text "COMPUTER ASSISTED INSTRUCTION" and "YEAR 2020/21", along with a house icon and a menu icon. The main title "CONTENTS" is in a blue header bar with back and forward arrow icons on either side.



**CONTENTS & PORTFOLIO QUESTIONS**

Attached Files: [OEC\\_Tourism\\_3\\_SB.pdf](#) (33.751 MB)

Below you can find some contents, & videos related to each of the units of the course book:  
Walker et al. Tourism 3 (2009). "Oxford English for Careers: Tourism 3. Oxford OUP" available at: [https://vk.com/topic-77391349\\_30946744](https://vk.com/topic-77391349_30946744)

Complete and answer the suggested activities in an e-portfolio and upload them in a single file in the section "Evaluation".

**Introduction to Tourism**

Availability: Item is hidden from students.

Attached Files: [Warming up Hospitality & Tourism...ppt](#) (3.583 MB)

PORTFOLIO/TEST QUESTIONS based on the attached notes:

1. Give a definition for hospitality.
2. What sections of the hospitality industry have you visited or used?
3. How does hospitality impact on our lives?
4. Explain why do you think that this industry attracts visitors to Spain.

**Unit 1- Tourism today**

Attached Files: [Unit 1. Tourism today.pptx](#) (5.615 MB)

**PORTFOLIO/TEST QUESTIONS:**

1. Why is tourism important for the economy of some cities or countries?
2. Explain available touristic attractions and services
3. What strategies do you think are needed to cope with the impact of tourists?
4. What social, economic and environmental impacts do you think may affect tourism in an area? Give an example of a particular region and indicate how you can help improve tourism
5. Write a report explaining present and past trends in tourism in a region. (ex. you can use the information of the attached video links)

**References:**

- Book: Tourism 3, (p. 8; p.120)
- Ex. Video on tourism trends Brandenton Islands: <https://www.youtube.com/watch?v=F2DQpRf4W8>
- Ex. Video on Canary Islands tourism trends: [http://www.grancanaria.com/estronato\\_turismo/tipo3com/ext/nav\\_secured/secure.php?u=0&file=filesadmin/ICT\\_Añual2015\\_EN.pdf&t=147590279&hash=785329cd53941608722091e4dc299](http://www.grancanaria.com/estronato_turismo/tipo3com/ext/nav_secured/secure.php?u=0&file=filesadmin/ICT_Añual2015_EN.pdf&t=147590279&hash=785329cd53941608722091e4dc299)

**Unit 2. NTOs**

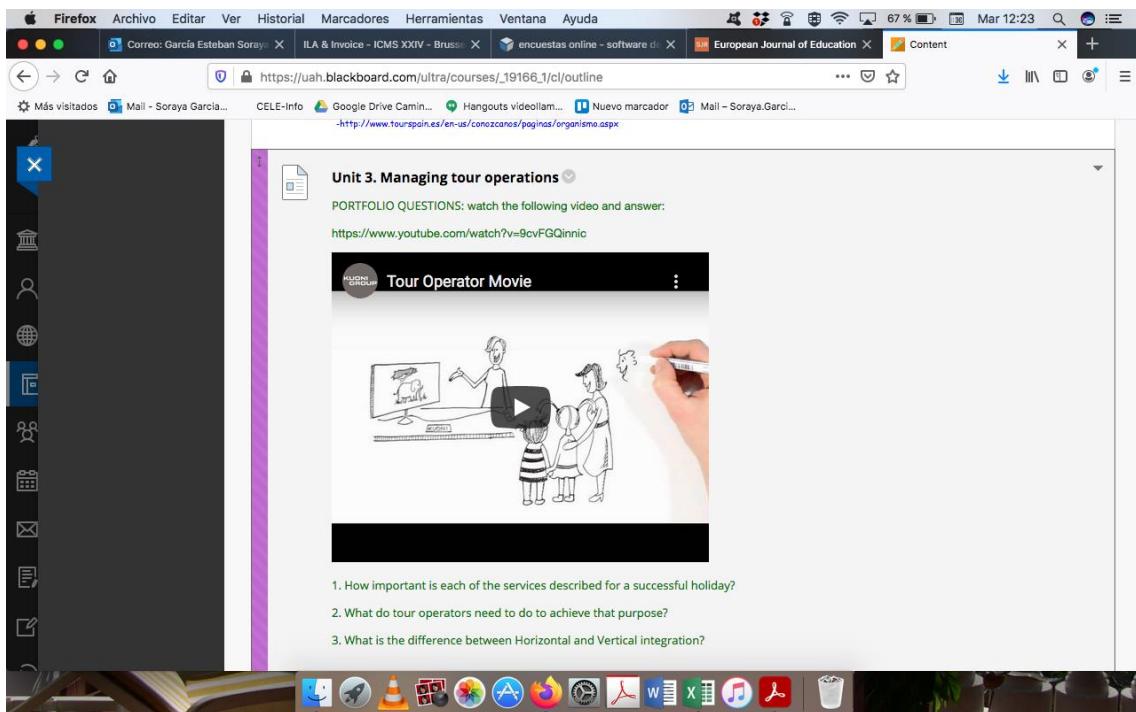
Attached Files: [Unit 2. NTOs.pptx](#) (596.068 KB)

**PORTFOLIO /TEST QUESTIONS**

Find out what NTO or organisations are responsible to promote your country as a destination abroad and the functions/objectives of the institution

**References:**

- Walker et al. Tourism 3 (2009, p.12)
- <http://www.tourspain.es/en-us/cosazonas/paginas/organismo.aspx>



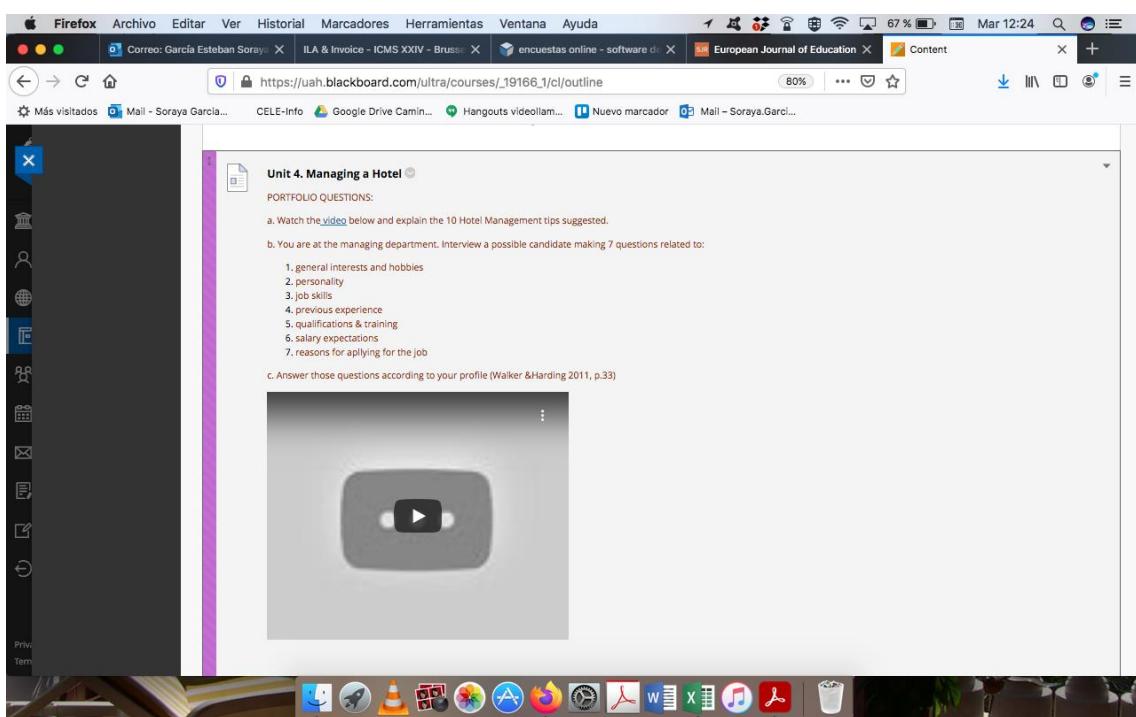
**Unit 3. Managing tour operations**

PORTFOLIO QUESTIONS: watch the following video and answer:

<https://www.youtube.com/watch?v=9cvFGQinnic>

**Tour Operator Movie**

1. How important is each of the services described for a successful holiday?  
 2. What do tour operators need to do to achieve that purpose?  
 3. What is the difference between Horizontal and Vertical integration?



**Unit 4. Managing a Hotel**

PORTFOLIO QUESTIONS:

- Watch the [video](#) below and explain the 10 Hotel Management tips suggested.
- You are at the managing department. Interview a possible candidate making 7 questions related to:
  - general interests and hobbies
  - personality
  - job skills
  - previous experience
  - qualifications & training
  - salary expectations
  - reasons for applying for the job
- Answer those questions according to your profile (Walker & Harding 2011, p.33)

Image 6. Content delivery in Units

#### 4. RESOURCES

The course includes varied resources such as: videos from the internet, self-recorded videos, presentations, social media (forum), use of theoretical contents from specialized websites, multimedia, power point presentations as illustrated in (image 7).



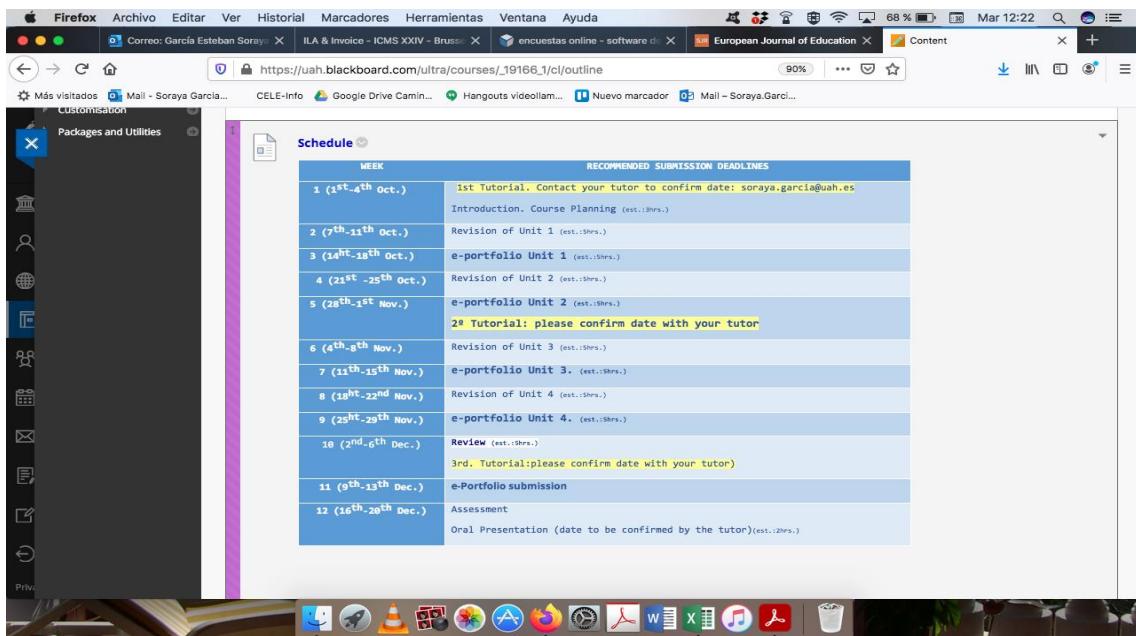
Image 7. Course resources

#### 5. TIMELINE & EVALUATION

The section “Evaluation” of the platform describes how the evaluation of the subject takes place and the marking criteria.

An initial assessment to analyze the student previous knowledge, content, environment and the training needs takes place in online scheduled tutorials as detailed in the course schedule (image 4).





WEEK	RECOMMENDED SUBMISSION DEADLINES
1 (1st - 4th Oct.)	1st Tutorial. Contact your tutor to confirm date: soraya.garcia@uh.es Introduction. Course Planning (est.:3hrs.) Revision of Unit 1 (est.:3hrs.)
2 (7th - 11th Oct.)	e-portfolio Unit 1 (est.:3hrs.)
3 (14th - 18th Oct.)	Revision of Unit 2 (est.:3hrs.)
4 (21st - 25th Oct.)	e-portfolio Unit 2 (est.:3hrs.)
5 (28th - 1st Nov.)	2º Tutorial: please confirm date with your tutor
6 (4th - 8th Nov.)	Revision of Unit 3 (est.:3hrs.)
7 (11th - 15th Nov.)	e-portfolio Unit 3. (est.:3hrs.)
8 (18th - 22nd Nov.)	Revision of Unit 4 (est.:3hrs.)
9 (25th - 29th Nov.)	e-portfolio Unit 4. (est.:3hrs.)
10 (2nd - 6th Dec.)	Review (est.:3hrs.) 3rd. Tutorial:please confirm date with your tutor)
11 (9th - 13th Dec.)	e-Portfolio submission
12 (16th - 20th Dec.)	Assessment Oral Presentation (date to be confirmed by the tutor)(est.:2hrs.)

Image 4. Course schedule

Students will be evaluated through formal evaluation, which implies both written documents, an oral test and is based in the scoring system as detailed in the Study Guide of the course. Summative assessment will be carried out through essays, tasks performance and an e-portfolio with verification questions as indicated in image 5. Students are informed of their marking criteria.



Universidad de Alcalá  COMPUTER ASSISTED INSTRUCTION YEAR 2020/21

EVALUATION



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The screenshot shows a Firefox browser window with several tabs open. The main content is a Blackboard course outline for 'European Journal of Education'. On the left, there's a sidebar with navigation links like 'Mis calificaciones', 'Comunicación', 'Anuncios', 'Course Management', 'Control Panel', 'Files', 'Course Tools', 'Evaluation', 'Grade Centre', 'Users and Groups', 'Customisation', and 'Packages and Utilities'. The main area contains three assignment sections:

- ASSIGNMENT 1. Writing / Paper**: This assignment consists of a paper including 4 writing topics revised in units 1-4 of "Tourism 3" student book:
  - 1. Report on the current state of Tourism
  - 2. Britain's brand image
  - 3. e-mail replies
  - 4. Your CV
- ASSIGNMENT 2. Oral Presentation**: Please upload here your video with the oral presentation (max. 5 minutes). Thanks!  
Preparation for Oral presentation based on a topic of your choice from Walker et al. (2009). Tourism 3\*, Units 1-4.:
  - 1. Access and tourism for Sub-Saharan Africa
  - 2. Presenting a new theme park
  - 3. Trouble shooting
  - 4. Presenting an eco-friendly policy\*Reference: Walker, Robin & Keith Harding. (2009). Oxford English for Careers: Tourism 3. Oxford: Oxford University Press.
- ASSIGNMENT 3. Course Portfolio**: You can upload here your final portfolio

At the bottom of the main area, there's a list of icons representing various software applications.

Image 5. Course evaluation and assessment criteria

Students can contact the tutor any time via e-mail or through the platform as illustrated in Image 8.

The screenshot shows a web page titled 'COMPUTER ASSISTED INSTRUCTION' for the 'YEAR 2020/21'. At the top, there are logos for 'Universidad de Alcalá' and 'ErasmusX'. A 'THANK YOU!' message is displayed above a large graphic. The graphic features a stylized illustration of three people (two adults and one child) interacting with a large computer monitor that has a keyboard attached. The background of the graphic is a gradient of pink, orange, and yellow. Below the graphic, the text 'STILL ANY QUESTIONS?' is prominently displayed in large blue letters, followed by 'Feel free to reach us via email!' and an emoji of a smiling face with sweat drops. An email address 'SORAYA.GARCIAE@UAH.ES' is also provided.

Image 8. Tutor availability



## 4.2 REFERENCES

S. Garcia-Estebar, E. Rojas and M. Burguillo, (2020). "Online Teaching Methodologies in Higher Education Credit Mobility Courses: ErasmusX pilot project," *2020 Sixth International Conference on e-Learning (econf)*, Sakheer, Bahrain, 2020, pp. 263-266, doi: 10.1109/econf51404.2020.9385453

García-Estebar, S. (2020). Telecollaboration for Civic Competence and SDG Development in FL Teacher Education. *European Journal of Education* 3 (3), 51-61. ISSN 2601-8624.

García Esteban, S. (2018). *Cursos virtuales de inglés de los negocios. Un análisis y evaluación de la educación a distancia*. Riga: Editorial Académica Española. ISBN: 978-620-2-23391-0.



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## UAH COURSE #2

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# CONTENT AND LANGUAGE INTEGRATED LEARNING IN BILINGUAL CONTEXTS

4 ECTS

Prof. Soraya Garcia - [Soraya.garciae@uah.es](mailto:Soraya.garciae@uah.es)

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### 1. IMPLEMENTATION

The subject ***Content and Language Integrated Learning in bilingual contexts*** is offered by the Department of Modern Philology as part of the institutional formal Teacher Training Master's Degree. The program is specified in the Study Guide. Despite this course was initially planned to be delivered face to face, there were some Erasmus students interested in taking the course and the tutor was conceded permission to be delivered online. The course offered to ErasmusX students was adapted to be delivered following Addie's instructional design model (see Garcia et al. 2020) through the institutional platform Blackboard, which includes a discussion forum. Along the course, students were required to use collaborative social media such as videos and use web apps. to revise specialized contents following a collaborative approach (Garcia Esteban 2020).

## 2. INTRODUCTION

This module revises basic issues related to TEFL, bilingualism and CLIL, looking towards the theories developed in this field so as to have a sound background knowledge on which to base decisions when teaching English as a foreign language and/or in bilingual settings. Participants are required to read the attached Study Guide and to visit the [Master website](#) for detailed information. Since it is a course entirely taught in English, students are expected to use the English language fluently (equivalent to C1-CEFR level or similar). The contents of the course are listed on the left side of the institutional platform BB. Important aspects of the subject and the institution are explained in the introduction as illustrated in image 2.

The screenshot shows the Blackboard course interface for the module '2020-21: EL APRENDIZAJE INTEGRADO DE CONTENIDOS Y LENGUAS EXTRANJERAS EN LA ENSEÑANZA BILINGÜE'. The left sidebar lists various course tools: Programa, Contents, Forum/ Chat Discussion, Evaluation / Assignments, Videoconference, Anuncios/Comentarios, Mail, Assignments, Calendar, My Marks, Course Management, Control Panel, Files, Course Tools, Evaluation, Grade Centre, Users and Groups, Customisation, and Packages and Utilities. The main content area is titled 'Programa' and contains the 'Introduction' page. The introduction text welcomes students to Content and Language Integrated Learning in bilingual contexts. It mentions that the module has been approved for synchronous online classes via Blackboard every two Fridays. It advises reading the Study Guide for detailed information and notes that students are expected to use the English language fluently. A video message from the Rector, Jose Vicente Saz, is embedded in the page. Below the video, there is a section for 'Soraya' with her contact information: Dr. Soraya García Esteban, Dpto. Filología Moderna, Universidad de Alcalá, e-mail: soraya.garcia@uah.es, and a link to her scholar profile: <https://scholar.uah.es/sorayagarcia/>.

Image 2. introduction and Study Guide in which important aspects of the subject are explained

## 3. CONTENT DESIGN & DEVELOPMENT

The contents are presented adapting the sequence and the course organization to the institutional learning platform. Contents have been designed taking into account different methodological approaches as described in Garcia Esteban (2020). The creation and production of the contents and materials of the course have been devised to be taught online using open content resources (i.e web based videos, power presentations, online book, etc.) and includes collaborative social media and a class forum where students and tutor can share ideas and interact. One example of how contents are delivered in each unit is illustrated in the images below (Image 3).

**UNITS review / presentations**

Build Content Assessments Tools Partner Content

**Presentation of the subject**

**Content: Global Goals**

Availability: Item is hidden from students.  
Attached Files: [Presentation\\_global-education.pdf](#) (1.089 MB)

**Unit 1. Intro Bilingual Education**

Attached Files: [CLIL\\_Unit\\_1\\_oct.21-22.pptx](#) (2.309 MB)  
[CLIL\\_Unit\\_1\\_oct.21-22.ppt.pdf](#) (6.808 MB)

Photo taken from Cummins in Salamanca 2017



<https://www.youtube.com/watch?v=zgt83JtI5k>

**Unit 2. Theories of bilingualism**

Availability: Item is hidden from students.  
Attached Files: [Master\\_Biling\\_Unit2\\_21.pdf](#) (4.027 MB)

**Unit 3. Models of bilingual education**

Availability: Item is hidden from students.  
Attached Files: [CLIL\\_theoretical\\_framework\\_201.pdf](#) (1.743 MB)  
[Master\\_Biling\\_Unit3\\_21.ppt.pdf](#) (2.817 MB)  
[Unit 3 Presentation Halbach Modelos enseñanza bilingüe.pdf](#) (79.578 KB)  
[CLIL provision in Europe\\_EURYDICE.pdf](#) (2 MB)

**Unit 4. Teaching through the FL**

Availability: Item is hidden from students.  
Attached Files: [Annex2\\_Coyle theoretical framework Explan+Activities-1.pdf](#) (182.016 KB)  
[Master\\_CLIL\\_Unit4\\_21\\_.pdf](#) (1.83 MB)

**Unit 5. Evaluation**

Availability: Item is hidden from students.  
Attached Files: [22191-tkt-clil-handbook.pdf](#) (851.656 KB)  
[5 Evaluation.pptx](#) (1.392 MB)  
[Perez\\_Cañado\\_CLILinEurope.pdf](#) (303.908 KB)

**Unit 3. Bilingual programs**

Availability: Item is hidden from students.  
Attached Files: [AssemblyEurSchool.jpg](#) (37.776 KB)  
[BodiesImpliedBilingualSchool.jpg](#) (34.6 KB)  
[Bodies\\_implied\\_BilingualEd.jpg](#) (28.539 KB)  
[Perez\\_Cañado\\_CLILinEurope.pdf](#) (267.841 KB)  
[Unit 3. Bilingual Programs\\_20.pdf](#) (324.499 KB)

**UNIT 1. Introduction to bilingual education**

We agree with Cummins (2013) that within the European context, the term Content and Language Integrated Learning (CLIL), is frequently used to refer to bilingual programs that typically teach one or more subjects through a second language, usually for less than 50 percent of the instructional time. Bilingual instruction can be implemented at any grade or age level, ranging from pre-school through university. There is remarkable consistency in the outcomes of bilingual programs implemented for both majority and minority language students in many parts of the world. The findings of thousands of research studies conducted under widely varying sociolinguistic conditions show that well-implemented bilingual programs promote strong oral and written language skills in the minority or target language at no cost to students' proficiency in the majority language. Therefore, if there are so many benefits, what are the drawbacks and controversies of bilingualism? The following lines explain this in detail.

The goals of bilingual programs vary widely across contexts. Some programs aim to promote bilingualism and biliteracy among students from the majority social group (e.g., Spanish speakers in Spain) by using a second language (e.g., English) as a partial medium of instruction. A prominent example of this type of enrichment bilingual program can be found in Canadian French immersion programs where French is used as a medium of instruction for much of the school day

Image 3. Content delivery in Units

#### 4. RESOURCES

The course includes varied resources such as: videos from the internet, self-recorded videos, presentations, social media (forum), use of theoretical contents from specialized websites, multimedia, power point presentations as illustrated in (image 4).

The grid contains a sub-categorisation of the five basic ingredients, and links to video clips illustrating each of the subcategories.

**1. Teacher facilitates exposure to input (at level '++ <st1:metricconverterProductID="1"' w:st="on"> 1')**

*Offer students lots of language input in the target language.*

Extended exposure to meaningful and functional foreign-language input is a crucial, although not exclusive, prerequisite for foreign-language acquisition. Before a lesson a CLIL teacher can select and tailor input material in order to make it challenging but still comprehensible for students. Two types of scaffolding can be distinguished during a lesson: firstly, the scaffolding of language or content by the selection of input material or secondly in the way CLIL teachers talk in the classroom.

Teacher activity	Do statement	Example
I.1 material selection	When choosing a 'text' or other materials for input, pay attention to both the language level and the content of the text so that it is just beyond the estimated level of the students.	I.1T
I.2 material adaptation in advance	Adjust selected texts in such a way that the level of the text is just beyond the estimated level of the students.	
I.3 material adaptation during teaching	Adapt selected texts during the lesson after realising it is above your students' comprehension level. Techniques used include: summarizing, paraphrasing, translation, synonyms, asking clarifying questions.	I.3A

The screenshot shows a Moodle course interface. On the left, there's a vertical navigation bar with various links like 'Programa', 'Contents', 'Forum/ Chat Discussion', 'Evaluation / Assignments', 'Videoconference', 'Anuncios/Comentarios', 'Mail', 'Assignments', 'Calendar', 'My Marks', 'Course Management', 'Control Panel', 'Files', 'Course Tools', 'Evaluation', 'Grade Centre', and 'Users and Groups'. The main content area displays a forum titled '2.2. According to the theories revised: do you consider that children who study in bilingual contexts /subjects achieve better than monolinguals?(Unit 2)'. Below the title is a 'Create Thread' button. The forum list shows several posts from different authors with their names and publication dates:

DATE	THREAD	AUTHOR	STATUS	UNREAD POSTS	UNREAD REPLIES TO ME
23/12/20 14:34	Monolingualism and Bilingualism	Desiree Hüselmann	Published	0	0
06/11/20 19:08	The new era is TRILINGUALISM	David Ramón Hurtado de Mendoza Alonso de Lievana	Published	0	0
05/11/20 16:22	bilinguals vs monolinguals	Zofia Mieszkowska	Published	0	0
04/11/20 18:41	Bilingual VS Monolingual context	Kanna Ramanoudjame	Published	0	0
02/11/20 20:46	Bilingual vs. Monolingual students	Blanca Omayra Moral Tabernerero	Published	0	0
02/11/20 18:47	Bilingual vs monolingual context	Aghis Amrouche	Published	0	0
01/11/20 20:12	Academic success: bilingual vs monolingual contexts	Álvaro Muñoz Espiego	Published	0	0
01/11/20 00:52	Bilingualism or monolingualism?	Cristina Puras Rodríguez	Published	0	0
31/10/20 03:42	bilingual vs monolingual context	Jordán Marinelli	Published	0	0

Image 4. Course resources (multimedia, forum, etc.)

## 5. TIMELINE & EVALUATION

The section “Evaluation” of the platform describes how the evaluation of the subject takes place and the marking criteria.

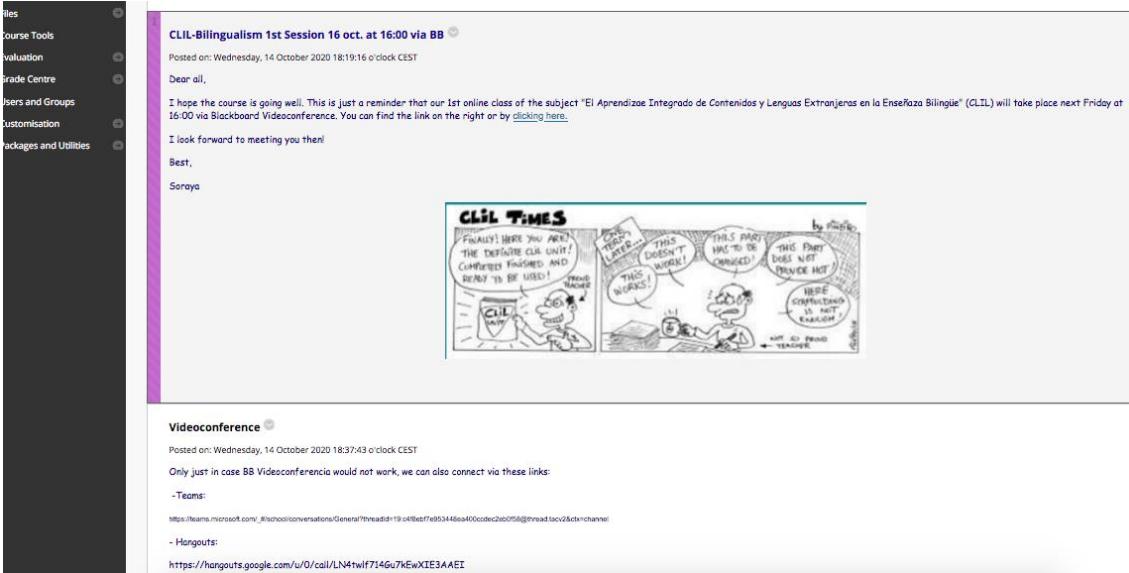
An initial assessment to analyze the student previous knowledge, content, environment and the training needs takes place in online scheduled tutorials as detailed in the course schedule (image 5).

The screenshot shows the course schedule. At the top, there's a 'Schedule' button. Below it is a calendar with a red circle around the 18th of October, with a handwritten note 'Sesión' over it. The schedule table lists events with their dates, times, activities, and descriptions:

Date /Time: 16:00-20:30	Activity / Class: Videoconference via BB
16th October	Master starts. WebCT platform contents accessible for students Presentation & Unit 1 revision
30th October	Unit 2 revision & Chat discussion
13th November	Unit 3 revision & Chat discussion
27th November	Unit 4 revision & Chat discussion
18th December	Oral Presentations
23rd December	Final submissions. Course End

Image 5. Course schedule

Tutor keeps continuous communication with the students via e-mail and through the platform as illustrated in Image 6.



The screenshot shows a Blackboard course interface. On the left, there's a vertical navigation bar with links like 'Files', 'Course Tools', 'Evaluation', 'Grade Centre', 'Users and Groups', 'Customisation', and 'Packages and Utilities'. The main content area has a purple header bar with the text 'CLIL-Bilingualism 1st Session 16 oct. at 16:00 via BB' and a small video camera icon. Below this, a message from 'Soraya' is displayed:

Posted on: Wednesday, 14 October 2020 18:19:16 o'clock CEST

Dear all,

I hope the course is going well. This is just a reminder that our 1st online class of the subject "El Aprendizaje Integrado de Contenidos y Lenguas Extranjeras en la Enseñanza Bilingüe" (CLIL) will take place next Friday at 16:00 via Blackboard Videconference. You can find the link on the right or by clicking [here](#).

I look forward to meeting you then!

Best,

Soraya

Below the message is a cartoon titled 'CLIL TIMES' with several panels showing characters discussing the course.

At the bottom of the main content area, there's a section titled 'Videoconference' with a note: 'Only just in case BB Vide conferencia would not work, we can also connect via these links:' followed by two links:

- Teams: [https://teams.microsoft.com/\\_/school/conversations/General/thread19:c49ebf7e93446ea40ccedc2eb0f5@thread.tacv2&ctx/channel](https://teams.microsoft.com/_/school/conversations/General/thread19:c49ebf7e93446ea40ccedc2eb0f5@thread.tacv2&ctx/channel)
- Hangouts: <https://hangouts.google.com/u/0/call/LN4twif7I4Gu7kEwXIE3AAEI>

Image 6. Communication with students

#### Image 4. Course schedule

Students will be evaluated through formal evaluation, which implies both written documents, an oral test and is based in the scoring system as detailed in the Study Guide of the course. Summative assessment will be carried out through essays, tasks performance and an e-portfolio with verification questions as indicated in image 7. Students are informed of their marking criteria.

**Evaluation / Assignments**

Build Content Assessments Tools Partner Content

**1. Submitted activities (30%)**

You can submit here your course activities

Your discussions and reflections concerning each unit will be evaluated in a final Portfolio (30%)

**ePortfolio assessment digital reflection learning**

Due date: 23 December

**1.1. Participation in the discussion group (5%)**

Participation (5%)

**2. Written assignment: 30%**

Attached Files: CLIL\_Assignment1\_Bilingualschools.docx (112.399 KB)

Please upload in this section your Written Assignment (30%)

**LANGUAGE SUPPORT IN BILINGUAL SCHOOLS**

(a full description can be found in the attachment or in this link)  
<https://sisu.ut.ee/multilingual/books/3-language-support-m bilingual-schools>

Your written assignment consists of 2 tasks:

- Activity 1: Watch a short video about a child learning a new language in an immersion setting and reflect on the difficulties this child is facing
- Activity 2: Analyse the interaction between a teacher and his pupils in a bilingual classroom based on a transcript of a lesson.
- Suggest teaching strategies for both cases

**Activity 1**

Watch the following extract from a short film entitled "Immersion" which shows a student who struggles to communicate in his new school because he has limited access to his native language. Reflect on the various challenges he faces and make a short list of those problems.

The importance of English Language Learning Strategies - Immersion (Moises in Math Class)  
<https://www.youtube.com/watch?v=D6HUV2eFdIg>

**Activity 2**

Analyze the following transcript of an immersion lesson (English/German).

Context: The school is an immersion school in Germany where English and German are taught from grade 1 onwards. The teacher in this case is a native speaker of English, most of the children speak German at home. The transcript is part of a lesson in grade 2. The extract shows the Monday morning ritual at the beginning of the first lesson where the teacher simply asks learners to tell him about their weekend.

Try to analyse the transcript and analyse the teacher's interaction with the learners based on the following grid. Try to find one or two examples for each category.

Elicitation techniques:	Example(s)
a) Open/referential questions	
b) Yes/No-questions	

Scaffolding and speech modification	Example(s)
a) Bridging	
b) Confirmation statements	
c) Clarification questions	
d) Tolerating code-switching	

Feedback	Example(s)
a) Recasts/implicit correction	
b) Positive feedback	

Transcript of classroom discourse (see attachment)

**3. Final paper: 30%**

Please upload here your final paper related to "Teaching CLIL".

**LESSON PLAN DESIGN & MATERIALS ADAPTATION to bilingual contexts**

Deadline: 17th December - max. ext. 10 pages -without appendix-

1. Select one SDG -Sustainable Development Goal- (i.e. Climate action, Good Health ...etc.), relate it to a given topic /content (i.e. Maths, Geography, English, etc.) to teach it following an appropriate approach to bilingual students.



2. Propose a lesson plan for 2-3 teaching sessions with different tasks/activities to teach specific Contents, Cognition, Culture, and Communicative skills (reading, listening, writing & speaking) using different materials and resources (videos, worksheets, etc.). You can use the attached template (also for the oral presentation in section 1.2.)

LEARNING ACTIVITIES AND TEACHING METHODS					
Unit lesson No.:	Date: / /	Time:	Class:	Length of lesson:	No. of students:
Learning activities/tasks	ACTIVITY 1 Aims Resources Time Interaction type Procedures Specific student needs (may be individual or whole class)				
	ACTIVITY 2				

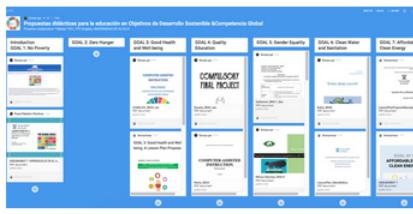
3. Include a justification section at the end of your paper. Rationalize why it is appropriate in a bilingual context and how do you assure the appropriate acquisition of the contents; methodology & resources used. Think of all the approaches revised along the course (ex. Bloom taxonomy, CALP Matrix, 4Cs, 3As -CLIL...)

**1.2. Participation (5%)**

Oral presentations (5%)

Present & upload in this section your SDG Lesson Plan proposal.

You can also publish it in our course padlet!



[https://padlet.com/soraya\\_garciae/dkqkw6xgg5](https://padlet.com/soraya_garciae/dkqkw6xgg5)

**Marking criteria**

Availability: Item is hidden from students.

EVALUATION	Activities (Portfolio) (40%)	Oral Presentations (5%)	Participation (5%)	Written assignment (Video Analysis): 30%	Final Paper (Materials adaptation) (30%)	TOTAL
1. Detailed and insightful material description & observations						
2. Reasoning behind opinions expressed, adaptations made to materials, etc.						
3. Understanding of bilingual FLT & its characteristics as reflected in critical comments & explanations of changes made to material						
4. Ability to relate/quote theoretical						

Image 7. Course evaluation and assessment criteria

## REFERENCES

S. Garcia-Estebar, E. Rojas and M. Burguillo, (2020). "Online Teaching Methodologies in Higher Education Credit Mobility Courses: ErasmusX pilot project," 2020 Sixth International Conference on e-Learning (econf), Sakheer, Bahrain, 2020, pp. 263-266, doi: 10.1109/econf51404.2020.9385453

García-Estebar, S. (2020). Telecollaboration for Civic Competence and SDG Development in FL Teacher Education. *European Journal of Education* 3 (3), 51-61. ISSN 2601-8624.

García-Estebar, S. , Colpaert J. (under revision). Integrating the Global Competence with Telecollaboration in CLIL Teacher Training, RED [Revista de Educación a Distancia \(RED\)](#)

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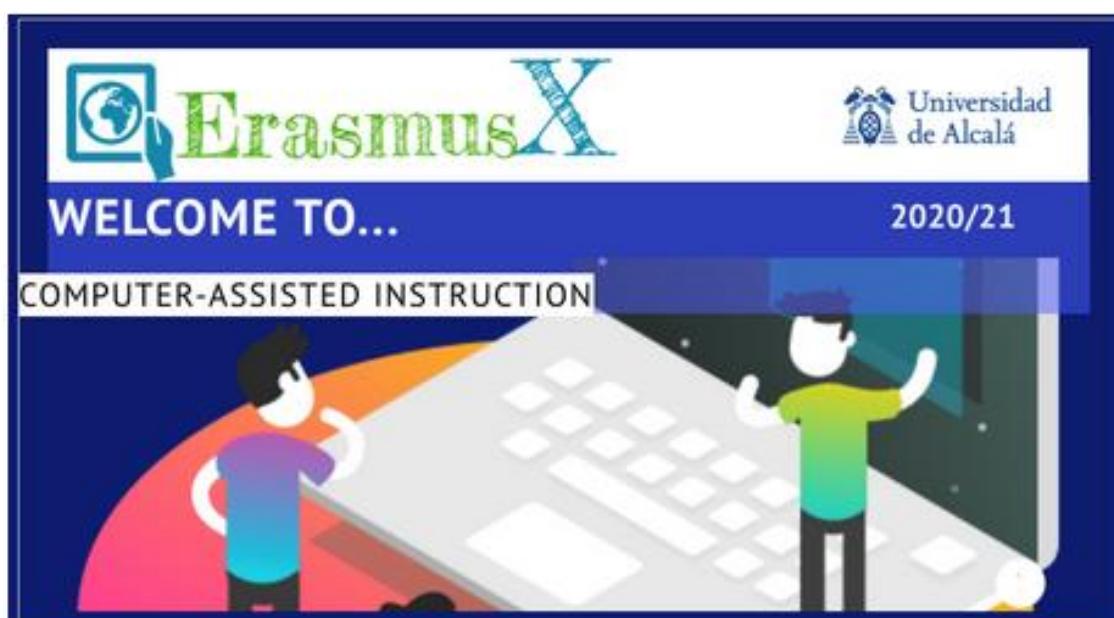
## UAH COURSE #3

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# COMPUTER-ASSISTED INSTRUCTION



**COMPUTER-ASSISTED INSTRUCTION - 4 ECTS / 1T**  
Prof. Soraya Garcia - [Soraya.garciae@uah.es](mailto:Soraya.garciae@uah.es)



### INDEX

1. IMPLEMENTATION	25
2. INTRODUCTION	25
3. CONTENT DESIGN & DEVELOPMENT	27
4. RESOURCES	31
5. TIMELINE & EVALUATION	31
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## 1. IMPLEMENTATION

The subject COMPUTER-ASSISTED INSTRUCTION is offered by the Department of Modern Philology as part of the Master's Degree in Teaching English as a Foreign Language. The program is specified in the Study Guide. The course offered to ErasmusX students has been adapted to be delivered online following Addie's instructional design model following Garcia et al. (2020) through the institutional platform Blackboard. Along the course, students are required to use collaborative social media, a discussion forum, didactic videos and web apps for the revision of specialized contents. The course includes an introductory video in which the tutor explains the contents and structure of the subject (image 1).

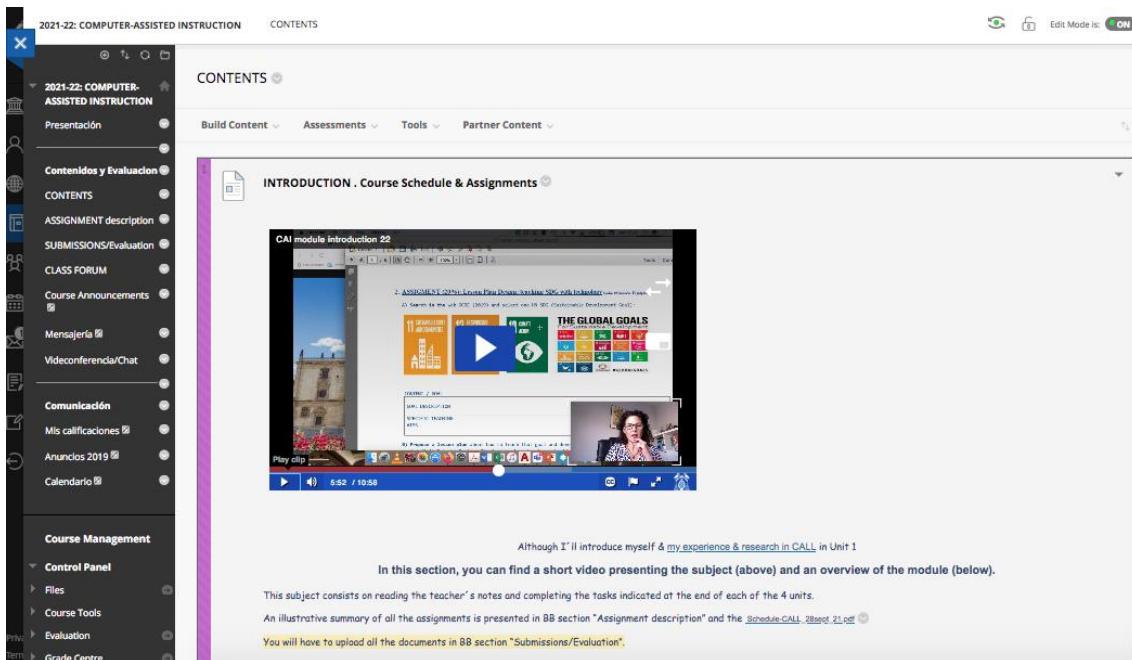
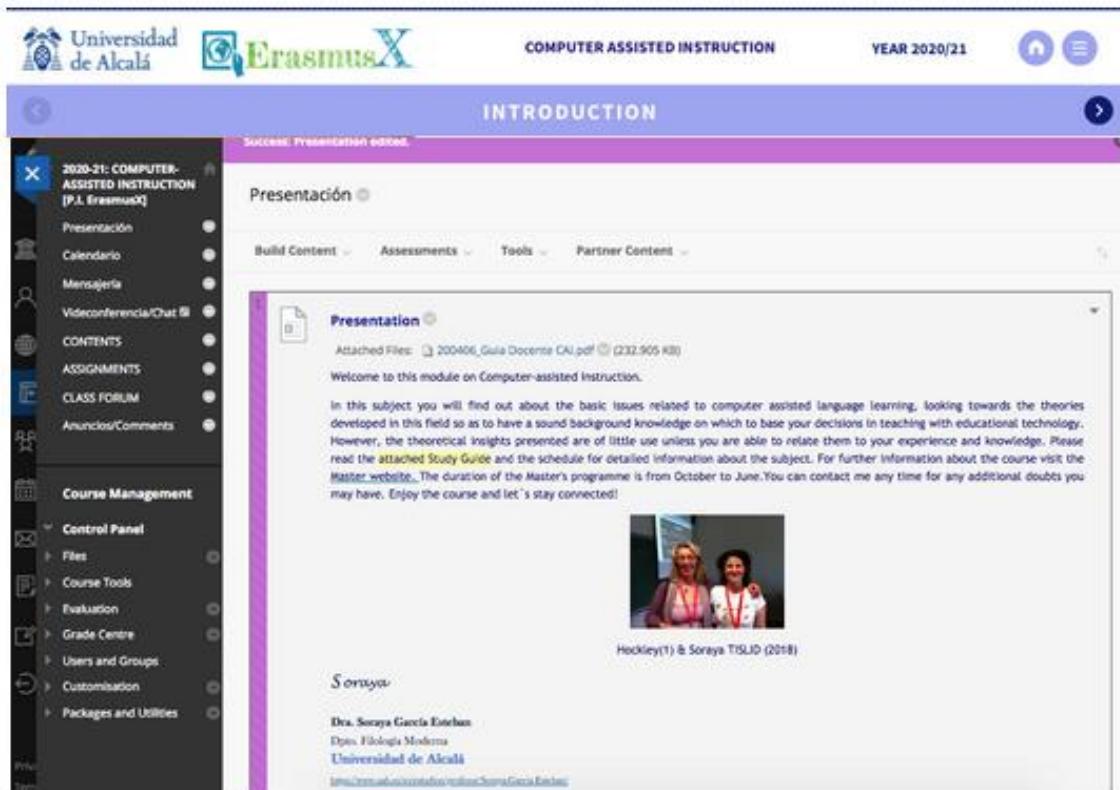


Image 1. Illustration of a video in which the tutor explains the contents

## 2. INTRODUCTION

**The module of Computer-Assisted Instruction** aims to offer the flexibility to study in a self-paced manner. In this **online** subject, students will find out about the basic issues related to computer assisted language learning (CALL), looking towards the theories developed in this field so as to have a sound background knowledge on which to base your decisions in teaching with educational technology. It's expected that students relate the theoretical **insights to their experience and knowledge**. Participants are encouraged to read the attached Study Guide and the schedule for detailed information about the subject. For further information about the course they can visit the [Master website](#). Students are reminded that they can contact the tutor

any time for any additional doubts you may have. This introduction is published as detailed in image 2.



The screenshot shows a Blackboard course page for the module '2020-21: COMPUTER-ASSISTED INSTRUCTION [P.J. ErasmusX]'. The top navigation bar includes the University of Alcalá logo, the ErasmusX logo, the course title 'COMPUTER ASSISTED INSTRUCTION', the year 'YEAR 2020/21', and two user icons. The main content area has a purple header 'INTRODUCTION' and a message 'Success! Presentation added.' Below this, there's a 'Presentación' section with a 'Presentation' link. Attached files include '202006\_Guia Docente CAI.pdf' (232.905 KB). The presentation text welcomes students to the module on Computer-assisted Instruction and encourages them to read the attached Study Guide and schedule for detailed information about the subject. It also mentions the duration of the Master's programme from October to June and provides contact information for Dr. Soraya García Esteban. A photo of two women, Hockley(1) & Soraya TISUD (2018), is displayed below the text. The left sidebar contains a navigation menu with links like 'Presentación', 'Calendario', 'Mensajería', 'Videoconferencia/Chat', 'CONTENTS', 'ASSIGNMENTS', 'CLASS FORUM', and 'Anuncios/Comments'. Under 'Course Management', there are links for 'Control Panel', 'Files', 'Course Tools', 'Evaluation', 'Grade Centre', 'Users and Groups', 'Customisation', and 'Packages and Utilities'.

Image 2. introduction and Study Guide in which important aspects of the subject are explained

The course contains an index where all the contents of the course can be found. Each item is listed in the institution platform Blackboard as appears in Image 3.



The image shows a screenshot of a course index page from the ErasmusX platform. At the top, there are logos for Universidad de Alcalá and ErasmusX, along with text indicating "COMPUTER ASSISTED INSTRUCTION" and "YEAR 2020/21". A navigation bar titled "INDEX" contains links to "INTRODUCTION", "RESOURCES", "EVALUATION", "FORUM", "CONTENTS", and "THANK YOU!". Below the navigation bar is a decorative graphic of three stylized figures (two adults and one child) gathered around a table with laptops and documents, set against a colorful circular background.

Image 3. Course Index

### 3. CONTENT DESIGN & DEVELOPMENT

The contents are presented specifying and adapting the sequence and organization to the institutional learning platform. They have been designed taking into account different methodological approaches following Garcia Esteban (2017, 2020).

The creation and production of the content and materials of the course have been designed to be taught online using open content resources (i.e web based videos, power presentations, online book, etc.) and includes collaborative social media and a class forum where students and tutor can share ideas and interact. One example of how contents are delivered in each unit is illustrated in the images bellow (Images 6-.

Universidad de Alcalá

COMPUTER ASSISTED INSTRUCTION
YEAR 2020/21

<
CONTENTS
>

X
2020-21: COMPUTER-ASSISTED INSTRUCTION

Presentación
Build Content
Assessments
Tools
Partner Content

CONTENIDO Y EVALUACIÓN
ASSIGNMENTS
CONTENTS
SUBMISSIONS/EVALUATION
CLASS FORUM
COURSE ANNOUNCEMENTS
MENSAJES
VIDEOPARTEO/CHAT

COMUNICABLE
MIS CALIFICACIONES
ANUNCIOS 2019/20
CALENDARIO

COURSE MANAGEMENT
CONTROL PANEL
FILES
COURSE TOOLS
EVALUATION
GRADE CENTRE
USERS AND GROUPS
CUSTOMISATION
PACKAGES AND UTILITIES

### Introduction

The Padagogy Wheel

This wheel shows the intersection of Bloom's and the SAMR model of technology integration in the classroom

<https://www.youtube.com/watch?v=2v6SDuJu7hc>

[Unit 1. Internet: Teaching & learning with TIC](#)

[Unit 2. Educational technology: theories & materials](#)

[Unit 3. Integrating Technology in the Classroom](#)  
Attached Files: [Unit 3\\_ CT in ELT.17sept.pdf](#) (702.202 KB)

[Unit 4 . Developing Digital competence and skills](#)  
Attached Files: [Unit 4\\_DigComp\\_things-1.pdf](#) (502.648 KB)

2020-21: COMPUTER-ASSISTED INSTRUCTION    CONTENTS    Unit 1. Internet: Teaching & learning with TIC

If this item does not open automatically you can open Unit 1. Internet: Teaching & learning with TIC here.

**UNIT 1. INTERNET & ITS POSSIBILITIES: TEACHING AND LEARNING WITH TECHNOLOGY**

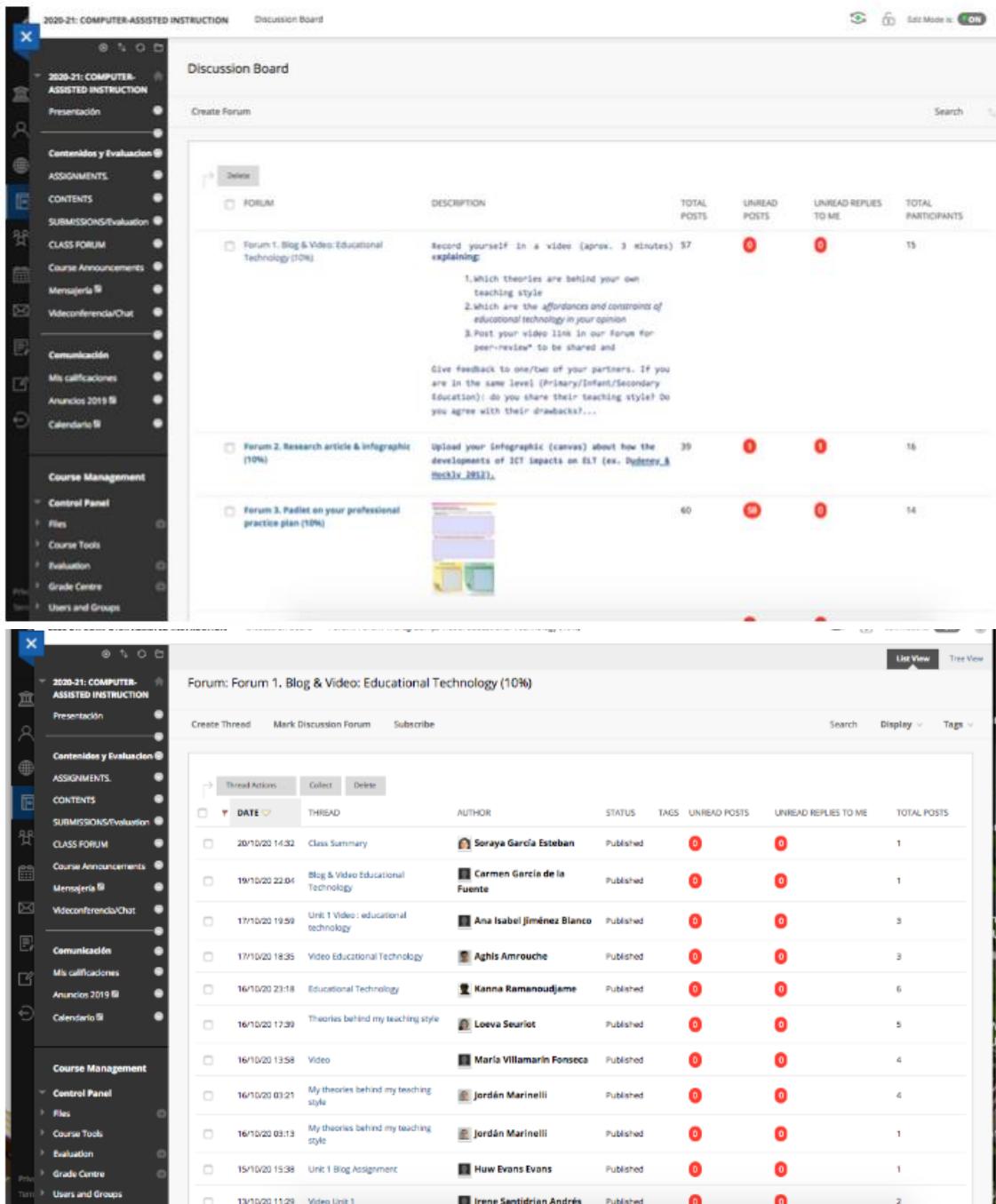
**INDEX**

**PART 1. TECHNOLOGY IN EDUCATION**

- 1.1. Introduction
- 1.2. Digital technologies in education
- 1.3. Some facts on students' use of computers at schools
- 1.4. Teachers practices and ICT?
- 1.5. Key messages for innovation policies in education

**PART 2. NETWORK MOBILE LEARNING**

- 1.6. The evolving role of education: from qualifications to skills
- 1.7. Networked learning, connectivism and mobile learning
- 1.8. Can e-learning be designed?
- 1.9. Student centered-learning: teachers as curators
- 1.10. Aligning pedagogy and technology



The screenshot displays two views of a Moodle course titled "2020-21: COMPUTER-ASSISTED INSTRUCTION".

**Top View:** The "Discussion Board" page. It shows a table of three forums under "Create Forum".

FORUM	DESCRIPTION	TOTAL POSTS	UNREAD POSTS	UNREAD REPLIES TO ME	TOTAL PARTICIPANTS
Forum 1: Blog & Video: Educational Technology (10%)	Record yourself in a video (aprox. 3 minutes) explaining: 1. Which theories are behind your own teaching style 2. which are the affordances and constraints of educational technology in your opinion 3. Post your video link in our Forum for peer-review* to be shared and Give feedback to one/two of your partners. If you are in the same level (Primary/Infant/Secondary Education): do you share their teaching style? Do you agree with their drawbacks?...	57	0	0	15
Forum 2: Research article & Infographic (10%)	Upload your Infographic (canvas) about how the developments of ICT impacts on EiT (ex. <a href="#">Puentey_&amp; Hockly_2012</a> )	39	1	1	16
Forum 3: Padlet on your professional practice plan (10%)		60	28	0	54

**Bottom View:** A detailed view of "Forum 1: Blog & Video: Educational Technology (10%)". It shows a list of posts with columns for DATE, THREAD, AUTHOR, STATUS, TAGS, UNREAD POSTS, UNREAD REPLIES TO ME, and TOTAL POSTS.

DATE	THREAD	AUTHOR	STATUS	TAGS	UNREAD POSTS	UNREAD REPLIES TO ME	TOTAL POSTS
20/10/20 14:52	Class Summary	Soraya García Esteban	Published		0	0	1
19/10/20 22:04	Blog & Video Educational Technology	Carmen García de la Fuente	Published		0	0	1
17/10/20 19:59	Unit 1 Video : educational technology	Ana Isabel Jiménez Blanco	Published		0	0	3
17/10/20 18:35	Video Educational Technology	Aghis Amrouche	Published		0	0	3
16/10/20 23:18	Educational Technology	Kanna Ramenoudjame	Published		0	0	6
16/10/20 12:39	Theories behind my teaching style	Loeva Seurist	Published		0	0	5
16/10/20 13:58	Video	Maria Villamarín Fonseca	Published		0	0	4
16/10/20 03:21	My theories behind my teaching style	Jordán Marinelli	Published		0	0	4
16/10/20 03:13	My theories behind my teaching style	Jordán Marinelli	Published		0	0	1
15/10/20 15:38	Unit 1 Blog Assignment	Huw Evans Evans	Published		0	0	1
13/10/20 11:29	Video Unit 1	Irene Santidrián Andrés	Published		0	0	2

Image 6. Content delivery in Units and

#### 4. RESOURCES

The course includes varied resources such as: videos from the internet, self-recorded videos, presentations, social media (forum), use of theoretical contents from specialized websites, multimedia, power point presentations as illustrated in (image 7).



Image 7. Course resources

#### 5. TIMELINE & EVALUATION

The section “Evaluation” of the platform describes how the evaluation of the subject takes place and the marking criteria as detailed in the course schedule (image 4). An initial assessment to analyze the student previous knowledge, content, environment and the training needs takes place in online scheduled tutorials.

WEEK		TIMELINE
		RECOMMENDED SUBMISSION DEADLINES
1 (1st-4th Oct.)		Access to the course contents Introduction & course plan
2 (5th-11th Oct.)		Revision of Unit 1 & Forum participation
3 (12th-18th Oct.)		e-portfolio Unit 1 task. Blog & Video on Educational Technology
4 (19th -25th Oct.)		Revision of Unit 2 & Forum discussion
5 (26th-1st Nov.)		e-portfolio Unit 2. Research article & infographic ICT in ELT
6 (2nd-8th Nov.)		Revision of Unit 3 & Forum discussion
7 (9th-15th Nov.)		e-portfolio Unit 3. Padlet & reflection on your practice plan
8 (16th-22nd Nov.)		Revision of Unit 4 & Forum discussion
9 (23rd-29th Nov.)		e-portfolio Unit 4. Web questionnaire on DigComp
10 (30th-6th Dec.)		Work on final project Lesson Plan
11 (7th-13th Dec.)		Review & Forum closure
12 (14th-22th Dec.)		Final project + e-Portfolio submission: until 22nd December

Image 4. Course schedule

Students will be evaluated through formal evaluation, which implies both written documents and collaborative assessment. The scoring system is detailed in the Study Guide of the course. Summative assessment will be carried out through essays, tasks performance and an e-portfolio with verification questions as indicated in image 5. Students are informed of their marking criteria.

Universidad de Alcalá
ErasmusX
COMPUTER ASSISTED INSTRUCTION
YEAR 2020/21

EVALUATION

2020-21: COMPUTER-ASSISTED INSTRUCTION
Presentación

Contenidos y Evaluación
ASSIGNMENTS

CONTENTS
SUBMISSIONS/Evaluation

CLASS FORUM
Course Announcements

Mensajería
Vide conferencia/Chat

Comunicación
Mis calificaciones

Anuncios 2019
Calendario

Course Management

Control Panel
Files

Course Tools
Evaluation

Grade Centre

Users and Groups

Customisation

### SUBMISSIONS/Evaluation

Build Content Assessments Tools Partner Content

**1. Portfolio**

Please upload the 4 Portfolio tasks in a single pdf. file here

**2. Lesson Plan Design**

Attached Files: [Rubrica\\_ODS\\_CAI.docx](#) (403.477 KB) [Poster template CAI.pptx](#) (357.495 KB)

Please upload your Lesson Plan Design in a single pdf. file here.

You can also share your content uploading your lesson plan to the Padlet: <https://padlet.com/nocogzjw1n1k6y6y6>

Propuestas didácticas para la educación en ODS & Competencia Global

Proyecto colaborativo - Máster TEFL, FPS (Inglés), UAH

**3. Online activities & Forum**

Assignment 2 evaluates your participation & contributions in the forum: you don't need to upload your posts here again.

### ASSIGNMENT description

Build Content Assessments Tools Partner Content

**ASSIGNMENTS**

Attached Files: [Schedule-CALL\\_28sept\\_22.pdf](#) (512.564 KB)

**ASSIGNMENTS**

1. Final E-Portfolio (40%)
2. Design of educational materials (20%)
3. Online activities (40%)

**1. ASSIGNMENT (40%): Final E-Portfolio based on the course units (max. extension 10 pages)**

This assignment consists of a reflective writing after reading each unit.  
Answer and justify each of the following questions in a single document (portfolio) and upload them in just one file to the platform.. Responses should be based on the class notes and are expected to expose and examine your own reflection with a supported justification. See rubrics for the evaluation.

Unit 1	Unit 2	Unit 3	Unit 4
Watch ARIAS' TED talk "Can a robot pass a university entrance exam?" Discuss the presenter's final question: a) What new type of education shall we have to provide? b) Support your ideas with data from the World Economic Forum report & the challenges of fourth industrial revolution for education	Reflect on your experience: a) What technology-supported pedagogic models and theories have you applied so far? b) What other innovative resources do you consider applying to improve education and learning? How would you evaluate them?	Read / watch Whyte's (2017) video and: a) Explain how would you use at least 5 of the mentioned tools in the classroom. b) Research and mention some other alternative / new resources that could also be used	Take the DigComp test and discuss: a) Are FL teachers developing properly the Communicative and Digital Competences? b) Justify your answer and propose ideas for improvement



**Course Tools**

- Evaluation
- Grade Centre
- Users and Groups
- Customisation
- Packages and Utilities

**2. ASSIGNMENT (20%): Lesson Plan Design teaching SDG with technology (max. 1page in a ppt, poster or Infographic)**  
This assignment consists of creating your own lesson plan which will be published in a collaborative (web) padlet. YOU CAN DO IT IN PAIRS  
The infographic /poster\* will have to include the following sections:  
1. Title, 2. Introduction, 3. Lesson plan 4. Methodology 5. Conclusions.  
Follow the 5 steps below:  
A) Search in the web OCDE (2019) and select one [UN SDG \(Sustainable Development Goal\)](#):

**1. TITLE OF THE LESSON PLAN / NAME OF THE AUTHOR**

**2. INTRODUCTION / GOAL**

GOAL DESCRIPTION
TEACHING AIMS

B) Propose a lesson plan about how to teach that goal and develop the communicative competence with digital technology. The lesson plan structure should be based on [Scott Thombury \(2013\)](#).

**3. LESSON PLAN proposal**

Main goal
Level
Time
Learning focus
Preparation
Technical use
<b>4. METHODOLOGY or Procedure</b>

**5. CONCLUSIONS:** Include a justification section rationalising how your lesson plan can enhance learning English as a foreign language based on the theories revised along the course.

**ASSIGNMENT (40%): Online tasks & Chat Forum Discussion**  
Follow this rubric for peer-assessment in Forum 5  
This assignment consists of participating in the forum.

**Unit 1. Blog & Video: Educational Technology**

**TASK** Read Murray Lindsay's article [What Are the Theories Behind Educational Technology?](#)

Record yourself in a video<sup>2</sup> (less than 3 minutes) explaining:  
1. Which theories are behind your own teaching style  
2. Which are the affordances and constraints of educational technology in your opinion  
3. Post your video link in our Forum for peer-review<sup>4</sup> to be shared and  
4. Give feedback of your classmates' videos

**EXPLANATION** Each student will give comment a video from another partner which has not been previously mentioned.  
Peer-review<sup>5</sup>: Sharing your work to receive feedback from others in ex. a forum (through technology) is a means of providing much more feedback than may be otherwise possible, particularly in larger cohorts. It not only develops self-assessment skills and enhances exposure to broad range of perspectives, but also a deeper understanding of quality and active learning & collaboration.

**Unit 2. Research article & Infographic ICT in ELT**

**TASK** Read one of these texts: [Dudene & Hockly \(2012\), ICT in ELT: how did we get here and where are we going or](#) [Dudene & Hockly \(2018\), Current and Future Digital Trends in ELT](#) and create a summary/presentation with ppt. or using an infographic template such as [canva.com](#)

Upload your infographic or poster about how the developments of ICT impacts on ELT.  
Peer-review: give feedback

**Unit 3. Padlet on your professional practice plan**

**TASK** Complete this Padlet template about your professional development.  
You can refer to how the pandemic has affected education  
Upload your padlet template summing up information from the course and its adaptation in a real classroom

**EXPLANATION** After exploring some of the key issues, trends and theories transforming the future of digital Learning, this activity is designed to encourage you to reflect on what you've learnt and apply it in relation to your professional context in order to identify clear actions and pathways for future improvement in the current situation.

**Unit 4. Web questionnaire on DigComp**

**TASK** Take the EC Digital skills accelerator [Self-Assessment Tool test](#)

Discuss your DigComp self-assessment results

**EXPLANATION** This auto-evaluation will provide you with an overview of your own digital competences in line with the DigComp Framework.

List of references:

Image 5. Course evaluation and assessment criteria

Students can contact the tutor any time via e-mail or through the platform as illustrated in Image 8.

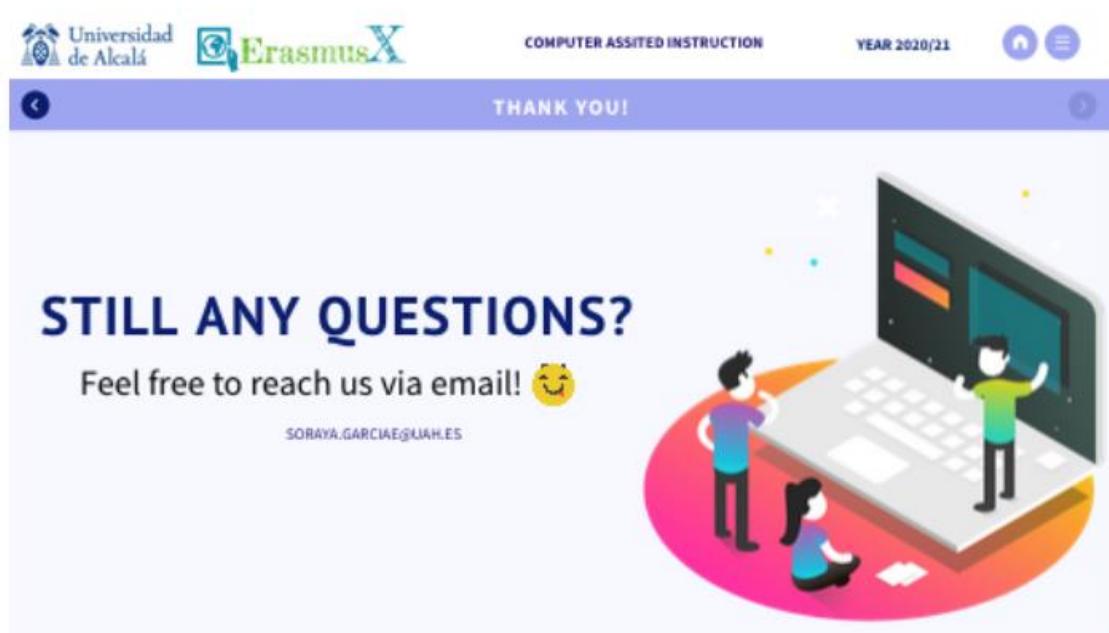


Image 8. Tutor availability

## REFERENCES

- S. Garcia-Esteban, E. Rojas and M. Burguillo, (2020). "Online Teaching Methodologies in Higher Education Credit Mobility Courses: ErasmusX pilot project," *2020 Sixth International Conference on e-Learning (econf)*, Sakheer, Bahrain, 2020, pp. 263-266, doi: 10.1109/econf51404.2020.9385453
- García-Esteban, S. (2020). Telecollaboration for Civic Competence and SDG Development in FL Teacher Education. *European Journal of Education* 3 (3), 51-61. ISSN 2601-8624.

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## UAH COURSE #4

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# International Trade and Globalization

## Context of the course

Course summary: The content of the course on International Trade and Globalization is structured in two parts. The first one is devoted to the analysis of trade policies and to the economic integration processes; it starts with the study of the main trade policy instruments from the perspective of both general and partial equilibrium analysis. Then the outcomes of trade policy are presented by considering market structures of imperfect competition and increasing returns of scale. This part concludes with the cost-benefit analysis of custom unions and economic integration processes.

The second part of the course covers the study of labour and capital mobility and the debates about globalization. We analyse first the welfare consequences of migrations and over international income distribution. Second, the concept of intertemporal comparative advantages is introduced and used to the analysis of international capital flows. Then we analyse the connection between trade and direct foreign investment flows in order to understand the role in transnational firms and to introduce emerging processes

Number of ECTS credits: 6 ECTS

Area/field: Economics

Level: Bachelor

**WELCOME TO INTERNATIONAL TRADE AND GLOBALIZATION**

The content of the course on International Trade and Globalization is structured in two parts. The first one is devoted to the analysis of trade policies and to the economic integration processes; it starts with the study of the main trade policy instruments from the perspective of both general and partial equilibrium analysis. Then the outcomes of trade policy are presented by considering market structures of imperfect competition and increasing returns of scale. This part concludes with the cost-benefit analysis of custom unions and economic integration processes.

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I hope you find the subject as didactic as interesting; do not hesitate to contact me to solve any possible doubts.  
Mercedes Burgillo (mercedes.burgillo@uah.es)

**SYLLABUS AND COURSE ORGANIZATION**

SCHEDULE		
ORIENTATIVE DATE	LECTURES	ACTIVITIES
9/02/21	TOPIC 1	
16/02/21	TOPIC 1	
23/02/21	TOPIC 2	ACTIVITY 1 DUE ON FEBRUARY 23
2/03/21	TOPIC 2	ACTIVITY 2 DUE ON MARCH 2
9/03/21	TOPIC 3.1	ACTIVITY 3 DUE ON MARCH 9
16/03/21	TOPIC 3.2	ACTIVITY 3 DUE ON MARCH 16
23/03/21	TOPIC 4	ACTIVITY 3 DUE ON MARCH 23
<b>30/03/21</b>	<b>HOLY WEEK</b>	<b>HOLY WEEK</b>
6/04/21	ONLINE QUIZ (TOPICS 1 TO 4)	ONLINE QUIZ (TOPICS 1 TO 4)
13/04/21	TOPIC 5	FIRST ESSAY ON ECONOMIC INTEGRATION. DUE ON APRIL 16
20/04/21	TOPIC 5	

## 1 Implementation

In the first part of the course (seven first weeks) there were synchronous lectures of topics 1, 2, 3 and 4, and also an asynchronous part consisting of reading material, participation in a forum monitored by the teacher, and delivering 5 activities related to the abovementioned topics and the reading material.

The second part of the course (seven last weeks) the course was asynchronous, and it included video lecture recording of topics 5, 6 and 7, and reading material to develop four essays on these topics and on topic 4.

Moreover, we had some online meetings to follow more closer the evolution of the students learning.



The evaluation system has been based on the control and monitoring of the students' work along the course. This evaluation system consists in:

- An online mid-term exam, it was a quiz about topics 1 to 4 (April 6<sup>th</sup> 2021)
- 5 Online activities on Aula Virtual related to articles to be read and topics 1 to 4 (from February 23th to March 23th)
- Writing of 4 essays on the topics 4 (economic integration), 5 (international exchanges in labour market), 6 (international exchanges in capital markets) and 7 (offshoring) from April 16<sup>th</sup> until to May 28<sup>th</sup>:

1. The first mid-term exam has supposed 40% of the final grade
2. The online activities has supposed 20% of the final grade
3. The 4 essays has supposed 40% of the final grade



## 2 Results

When the course “International Trade” was promoted to Erasmus+ students, expectation was to have at least 5 students. In the spring semester of 2020/2021 online course “International Trade” was chosen by 8 Erasmus+ mobility students from France (3), Germany (2), Italy (1), Morocco (1), and Russia (1). Moreover, the course was followed by other 9 students from Alcalá University that were themselves Erasmus Students abroad or were doing training stages and were not able to attend the regular synchronous classes, as the course 2020-2021 was developed on online synchronous classes due to the Covid pandemic. All 17 students continued to study the course and received positive grades.

Anonymous student course quality evaluation organized by University of Alcalá indicated that students evaluated on average “International Trade” course in 10 point scale system as 7.4 on average.

Evaluation more in details:

- 7.6 points The content of the study course corresponded to the description of the course
- 8.1 points The evaluation system corresponded to the description of the course
- 7.8 The disponibility of the teacher to assist the students
- 8.5 points The respect of the teacher to the students
- 7 points The adequation between contents and working hours.
- 7.2 Global satisfaction with teaching
- 6.9 points The lecturer presents the course topics in an understandable way
- 7.8 points The lecturer was available for consultations

## 3 Course Contents:



## TOPICS:

### PART I. Trade policy

#### 1. The instruments of trade policy

- Tariffs.
- Costs and benefits of tariffs
- General equilibrium analysis of tariffs.
- Export subsidies.
- Quotas. Quotas vs tariffs.
- Voluntary constraints on exports
- Other instruments.

Krugman: TOPIC 9

#### 2. Imperfect competition, increasing returns and strategic trade policy.

- Technology and externalities.
- Tariffs and quotas in competitive settings.
- Antidumping measures
- Imperfect competition and strategic trade policies.
- Protectionism with increasing returns.
- Trade policies and monopolistic competition.

Krugman: TOPIC 12

#### 3. The political economy of trade policy.

- Advantages of free trade.
- Criticisms of free trade
- The arguments in favour of protectionism.
- Optimal tariffs.
- Retaliation.
- The theory of effective protection.
- Income distribution and trade policy.
- Trade policy in development countries.
- Trade policy and environmental regulation
- The globalization trilemma
- Fair trade.

Krugman: TOPIC 10 (3.1) AND TOPIC 11 (3.2)

#### **4. Preferential trade agreements and economic integration.**

- Regional integration processes.
- Trade areas and free trade vs custom unions .
- Effect of trade creation and trade deviation.
- Dynamic effects of custom unions.
- Center-peripheria models.
- International negotiations and trade policy.
- Regionalism and multilateralism.

Krugman: TOPIC 10

### **PART II. Production factors mobility and the consequences of globalization.**

#### **5. International labour mobility.**

- International trade vs Interregional trade.
- Factors' trade.
- Welfare impacts.
- Effects of factors' trade over goods and services' trade.
- The international mobility of labour.
- The economic impact of migrations.

Krugman: TOPIC 4

#### **6. The international mobility of capital and multinational firms.**

- International capital movements.
- Direct foreign investment.
- International loans and international debt. The intertemporal production possibility frontier and trade.
- Intertemporal comparative advantages.
- The theory of the multinational firm.
- Advantages of internationalization.
- Multinational firms in practice.

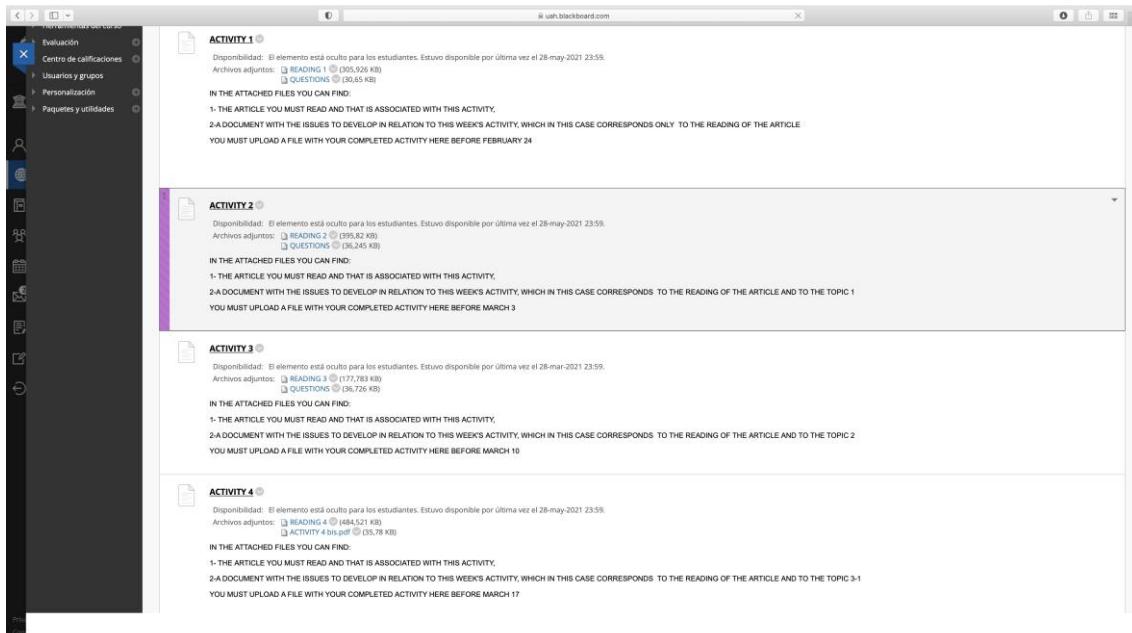
Krugman: TOPIC 8

#### **7. Offshoring**

- Delocalization and externalization.
- The basic *offshoring model*
- Effects over international income distribution.
- The *offshoring gains*
- *Offshoring of services.*
- Impacts over wages, employment and labour and environmental standards.

Krugman: TOPIC 8

## ACTIVITIES:



**ACTIVITY 1**

Disponibilidad: El elemento está oculto para los estudiantes. Estuvo disponible por última vez el 28-may-2021 23:59.  
 Archivos adjuntos:  READING 1 (305,926 KB)  
 QUESTIONS 1 (105,65 KB)

IN THE ATTACHED FILES YOU CAN FIND:

1. THE ARTICLE YOU MUST READ AND THAT IS ASSOCIATED WITH THIS ACTIVITY.
- 2-A DOCUMENT WITH THE ISSUES TO DEVELOP IN RELATION TO THIS WEEK'S ACTIVITY, WHICH IN THIS CASE CORRESPONDS ONLY TO THE READING OF THE ARTICLE

YOU MUST UPLOAD A FILE WITH YOUR COMPLETED ACTIVITY HERE BEFORE FEBRUARY 24

**ACTIVITY 2**

Disponibilidad: El elemento está oculto para los estudiantes. Estuvo disponible por última vez el 28-may-2021 23:59.  
 Archivos adjuntos:  READING 2 (205,82 KB)  
 QUESTIONS 2 (36,726 KB)

IN THE ATTACHED FILES YOU CAN FIND:

1. THE ARTICLE YOU MUST READ AND THAT IS ASSOCIATED WITH THIS ACTIVITY.
- 2-A DOCUMENT WITH THE ISSUES TO DEVELOP IN RELATION TO THIS WEEK'S ACTIVITY, WHICH IN THIS CASE CORRESPONDS TO THE READING OF THE ARTICLE AND TO THE TOPIC 1

YOU MUST UPLOAD A FILE WITH YOUR COMPLETED ACTIVITY HERE BEFORE MARCH 3

**ACTIVITY 3**

Disponibilidad: El elemento está oculto para los estudiantes. Estuvo disponible por última vez el 28-mar-2021 23:59.  
 Archivos adjuntos:  READING 3 (177,783 KB)  
 QUESTIONS 3 (36,726 KB)

IN THE ATTACHED FILES YOU CAN FIND:

1. THE ARTICLE YOU MUST READ AND THAT IS ASSOCIATED WITH THIS ACTIVITY.
- 2-A DOCUMENT WITH THE ISSUES TO DEVELOP IN RELATION TO THIS WEEK'S ACTIVITY, WHICH IN THIS CASE CORRESPONDS TO THE READING OF THE ARTICLE AND TO THE TOPIC 2

YOU MUST UPLOAD A FILE WITH YOUR COMPLETED ACTIVITY HERE BEFORE MARCH 10

**ACTIVITY 4**

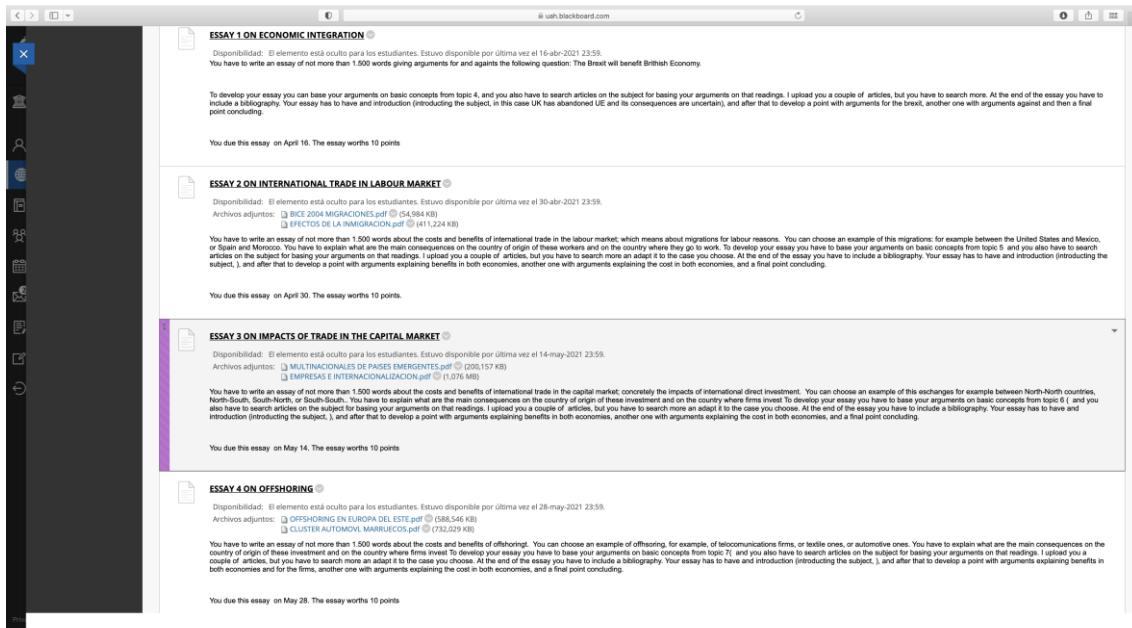
Disponibilidad: El elemento está oculto para los estudiantes. Estuvo disponible por última vez el 28-may-2021 23:59.  
 Archivos adjuntos:  READING 4 bis.pdf (35,78 KB)

IN THE ATTACHED FILES YOU CAN FIND:

1. THE ARTICLE YOU MUST READ AND THAT IS ASSOCIATED WITH THIS ACTIVITY.
- 2-A DOCUMENT WITH THE ISSUES TO DEVELOP IN RELATION TO THIS WEEK'S ACTIVITY, WHICH IN THIS CASE CORRESPONDS TO THE READING OF THE ARTICLE AND TO THE TOPIC 3-1

YOU MUST UPLOAD A FILE WITH YOUR COMPLETED ACTIVITY HERE BEFORE MARCH 17

## ESSAYS:



**ESSAY 1 ON ECONOMIC INTEGRATION**

Disponibilidad: El elemento está oculto para los estudiantes. Estuvo disponible por última vez el 16-abr-2021 23:59.  
 You have to write an essay of not more than 1.500 words giving arguments for and against the following question: The Brexit will benefit British Economy.

To develop your essay you can base your arguments on basic concepts from topic 4, and you also have to search articles on the subject for basing your arguments on that readings. I upload you a couple of articles, but you have to search more. At the end of the essay you have to include a bibliography. Your essay has to have an introduction (introducing the subject, in this case UK has abandoned UE and its consequences are uncertain), and after that to develop a point with arguments for the brexit, another one with arguments against and a final point concluding.

You due this essay on April 16. The essay worths 10 points

**ESSAY 2 ON INTERNATIONAL TRADE IN LABOUR MARKET**

Disponibilidad: El elemento está oculto para los estudiantes. Estuvo disponible por última vez el 30-abr-2021 23:59.  
 Archivos adjuntos:  BCE 2004 MIGRACIONES.pdf (54,984 KB)  
 EFECTOS DE LA INMIGRACION.pdf (411,224 KB)

You have to write an essay of not more than 1.500 words about the costs and benefits of international trade in the labour market; which means about migrations for labour reasons. You can choose an example of this migrations: for example between the United States and Mexico, Spain and Morocco. You have to explain what are the main consequences on the country of origin of these workers and on the country where they go to work. To develop your essay you have to base your arguments on basic concepts from topic 5 and you also have to search more an add it to the case you choose. At the end of the essay you have to include a bibliography. Your essay has to have an introduction (introducing the subject), and after that to develop a point with arguments explaining benefits in both economies, another one with arguments explaining the cost in both economies, and a final point concluding.

You due this essay on April 30. The essay worths 10 points

**ESSAY 3 ON IMPACTS OF TRADE IN THE CAPITAL MARKET**

Disponibilidad: El elemento está oculto para los estudiantes. Estuvo disponible por última vez el 14-may-2021 23:59.  
 Archivos adjuntos:  MULTINACIONALES DE PAISES EMERGENTES.pdf (205,157 KB)  
 EMPRESAS E INTERNACIONALIZACION.pdf (1,076 MB)

You have to write an essay of not more than 1.500 words about the costs and benefits of international trade in the capital market; concretely the impacts of international direct investment. You can choose an example of this exchanges for example between North-North countries, North-South, South-North, or South-South. You have to explain what are the main consequences on the country of origin of these investments and on the country where firms invest. To develop your essay you have to base your arguments on basic concepts from topic 6 ( and you also have to search more an add it to the case you choose), but you have to search more an add it to the case you choose. At the end of the essay you have to include a bibliography. Your essay has to have an introduction (introducing the subject), and after that to develop a point with arguments explaining benefits in both economies, another one with arguments explaining the cost in both economies, and a final point concluding.

You due this essay on May 14. The essay worths 10 points

**ESSAY 4 ON OFFSHORING**

Disponibilidad: El elemento está oculto para los estudiantes. Estuvo disponible por última vez el 28-may-2021 23:59.  
 Archivos adjuntos:  OFFSHORING EN EUROPA DEL ESTE.pdf (588,546 KB)  
 CLUSTER AUTOMOVIL MARRUECOS.pdf (732,029 KB)

You have to write an essay of not more than 1.500 words about the costs and benefits of offshoring. You can choose an example of direction, for example, of relocalization firms, or textile cases, or automotive ones. You have to explain what are the main consequences on the country of origin of these investments and on the country where firms invest. To develop your essay you have to base your arguments on basic concepts from topic 7, and you also have to search more an add it to the case you choose. At the end of the essay you have to include a bibliography. Your essay has to have an introduction (introducing the subject), and after that to develop a point with arguments explaining benefits in both economies and for the firms, another one with arguments explaining the cost in both economies, and a final point concluding.

You due this essay on May 28. The essay worths 10 points

## UAH COURSE #5

# BEAT (BIOMEDICAL ENGINEERING AND ASSISTIVE TECHNOLOGIES)

### 1 Context

This course was implemented by the Electronics Department of the Polytechnic School (EPS) of University of Alcalá.

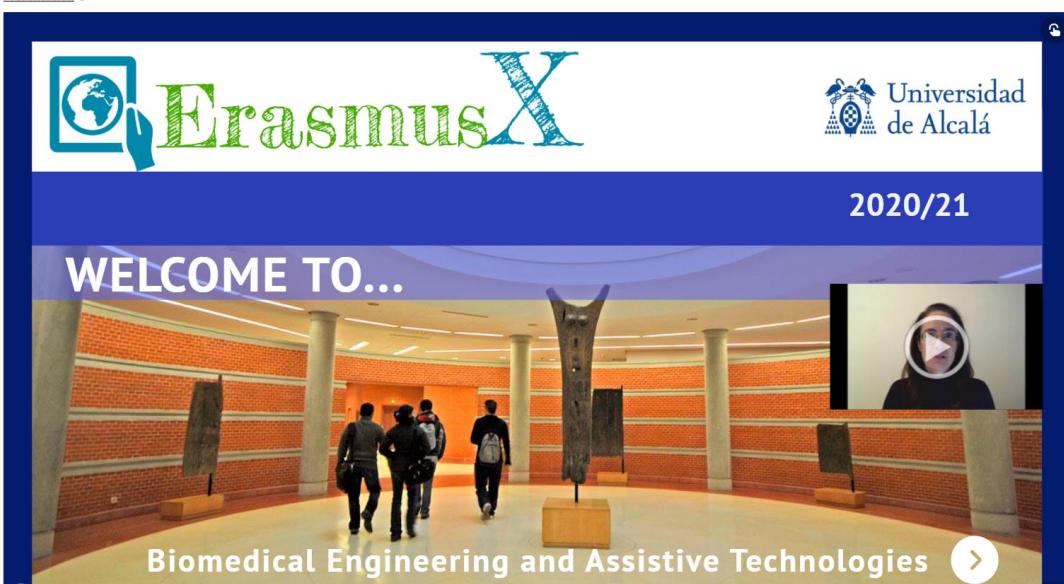
ECTS = 3

Area = Engineering (Electrical / Electronics / Telecommunication)

Already existed? No, but some of its contents belong to optative courses of the last courses of some BSc and MSc degrees in EPS.

### 2 Implementation

This course was implemented mainly via documents and online tests. No videos were created, although an introduction to the course (with the presentation of professors, etc.), as well as multimedia references were provided.

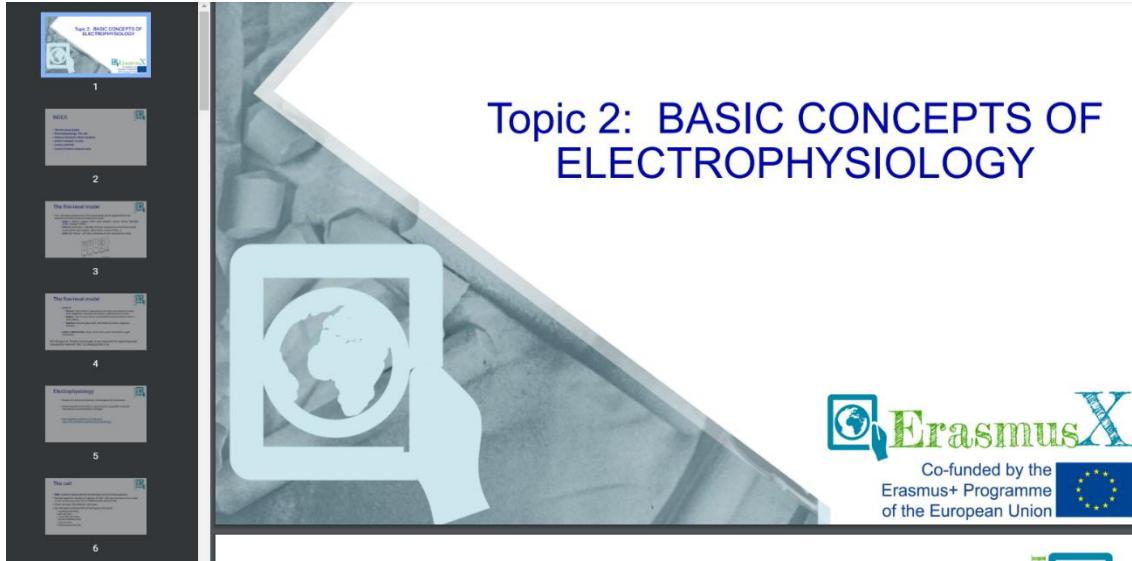


The screenshot shows a presentation slide with the following elements:

- Top Left:** ErasmusX logo.
- Top Right:** Logo of Universidad de Alcalá.
- Date:** 2020/21.
- Welcome Text:** WELCOME TO... (in white on a blue background).
- Background Image:** A photograph of a modern university hallway with red brick walls and white columns. Several students are walking through the space.
- Bottom Text:** Biomedical Engineering and Assistive Technologies.
- Bottom Right:** A video player interface showing a person's face.



- 
-  [Topic 1: Introduction](#) 
  -  [Topic 2: Basic concepts of electrophysiology](#) 
  -  [Topic 3: Sensory systems](#) 
  -  [Topic 4: Dependency and society](#) 
  -  [Topic 5: Assistive technologies for sensory disabilities](#) 
  -  [Topic 6: Assistive technologies for physical disabilities](#) 
  -  [Topic 7: Assistive technologies for communication disabilities](#) 
  -  [Topic 8: Assistive technologies for intellectual disabilities](#) 



### 3 Results

Unfortunately, no students joined the course. We believe this was mainly due to the few incoming students in EPS for this type of courses. However, the course is still currently available during year 2021/2022 for incoming students. Moreover, the course will be probably leveraged for an online education initiative currently being promoted by the University of Alcala and pioneered by EPS.



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## UAH COURSE #6

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# SOFTWARE TESTING

### 1 Context

This course was implemented by the Computer Science Department of the Polytechnic School (EPS) of University of Alcalá.

ECTS = 3

Area = Engineering (Computer Science)

Already existed? No, but some of its contents belong to an online course previously implemented for international education too, as part of an internal UAH initiative.

### 2 Implementation

All materials are delivered under a Creative Commons license and, the particular feature of this course is that all materials were also implemented following universal content accessibility guidelines. Another special feature are the self-assessment tests included in it. In this case, most of the created content was also presentations and written documents.

Course ErasmusX

Build Content Assessments Tools

-  **1. Fundamentals of Testing**
-  **2. Testing Design Techniques**
-  **3. Tool Support for Testing**

## Learning Unit 1



ErasmusX  
2018-1-ES01-KA203-050886



## 1.1. Importance of testing and key terms

Build Content  Assessments  Tools  Partner Content 



[Content 1.1 PDF](#) 



[Content 1.1 WORD](#) 

Availability: Item is hidden from students.



[What is Software Testing & Why Testing is Important?](#) 



**What is Software Testing & Why Testing is Important?**

Duración: 1:57  
Usuario: n/a - Añadida: 3/06/14



[Peter Neumann's collection on Risks to the Public](#) 



[Self-Assessment 1.1](#) 



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of the European Union



## 1.4 Psychology of Testing

Many different people might be involved in all the testing tasks, and they might have different backgrounds. Some of them will be developers, professional testers or specialists, such as those with performance testing skills, while others might be users that assist with acceptance testing. Whoever is involved in testing needs some knowledge of the skills and techniques of testing to make an effective contribution to the entire testing work.

Testing is more effective if it is not carried out by the person who wrote the code, because the creator of anything has a special relationship with the created object. This

## 3 Results

Unfortunately, no students joined the course. We believe this was mainly due to the few incoming students in EPS for this type of courses. However, the course is still currently available during year 2021/2022 for incoming students. Moreover, the course will be probably leveraged for an online education initiative currently being promoted by the University of Alcalá and pioneered by EPS.

## UAH COURSE #7

# TRANSMISSION LINES

### 1 Context

This course was implemented by the Signal Theory Department of the Polytechnic School (EPS) of University of Alcalá.

ECTS = 3

Area = Engineering (Electrical / Electronics / Telecommunication)

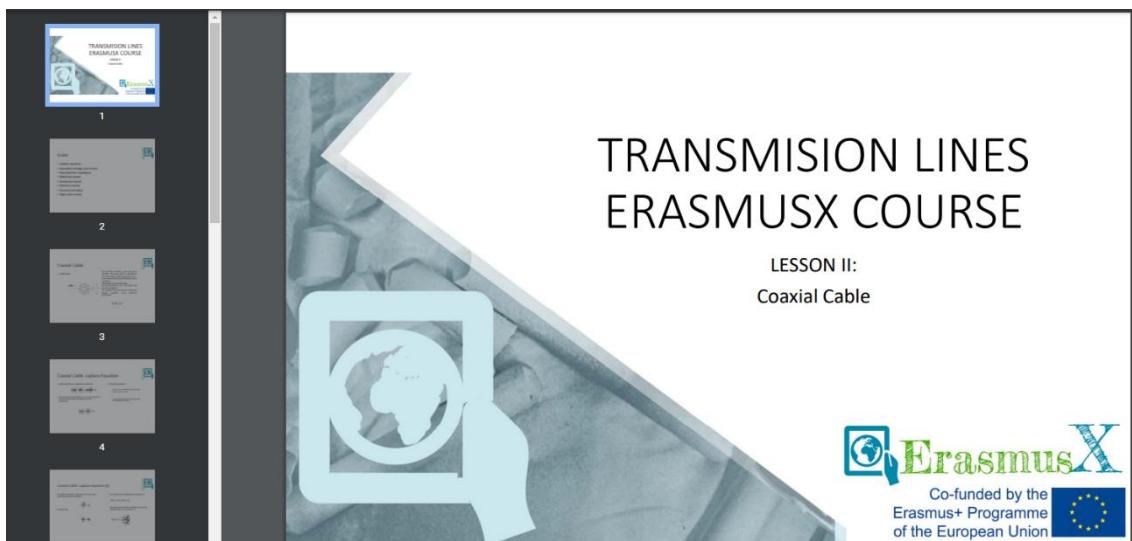
Already existed? Yes, it is a basic course from the BSc engineering degrees in EPS, and particularly from the Telecommunication area. However, it only existed in Spanish and for face-to-face implementation.

### 2 Implementation

In this course, the laboratory parts were particularly relevant, and that is why the authors had to rethink the whole structure of it. For this reason, they decided to use a simulator, and provided a recorded videotutorial and detailed guidelines for each lab.



The screenshot shows the ErasmusX website interface. At the top left is the ErasmusX logo. To its right is the Universidad de Alcalá logo. In the center, the text "2020/21" is displayed. Below this, a large blue banner features the text "WELCOME TO..." in white. A photograph of a person in a pink lab coat standing in front of a large metal grid (anechoic chamber) is centered in the banner. At the bottom right of the banner, the text "Transmission Lines Course" is followed by a right-pointing arrow icon.



TRANSMISSION LINES  
ERASMUSX COURSE

LESSON II:  
Coaxial Cable

ErasmusX  
Co-funded by the  
Erasmus+ Programme  
of the European Union

## Laboratory

Desarrollar contenido ▾ Evaluaciones ▾ Herramientas ▾ Contenidos



### Laboratory videotutorial ▾

Disponibilidad: Este elemento está oculto para los estudiantes



### Laboratory: Sesión 1 coaxial ▾

Disponibilidad: Este elemento está oculto para los estudiantes



### Laboratory: Sesión 3 waveguide ▾



### Laboratory: Sesión 2 microstrip line ▾

Disponibilidad: Este elemento está oculto para los estudiantes

### 3 Results

Unfortunately, no students joined the course. We believe this was mainly due to the few incoming students in EPS for this type of courses. However, the course is still currently available during year 2021/2022 for incoming students. Moreover, the course will be probably leveraged for an online education initiative currently being promoted by the University of Alcala and pioneered by EPS.

## UAH COURSE #8

# INTRODUCTION TO TELETRAFFIC ENGINEERING

### 1 Context

This course was implemented by the Automatics Department of the Polytechnic School (EPS) of University of Alcalá.

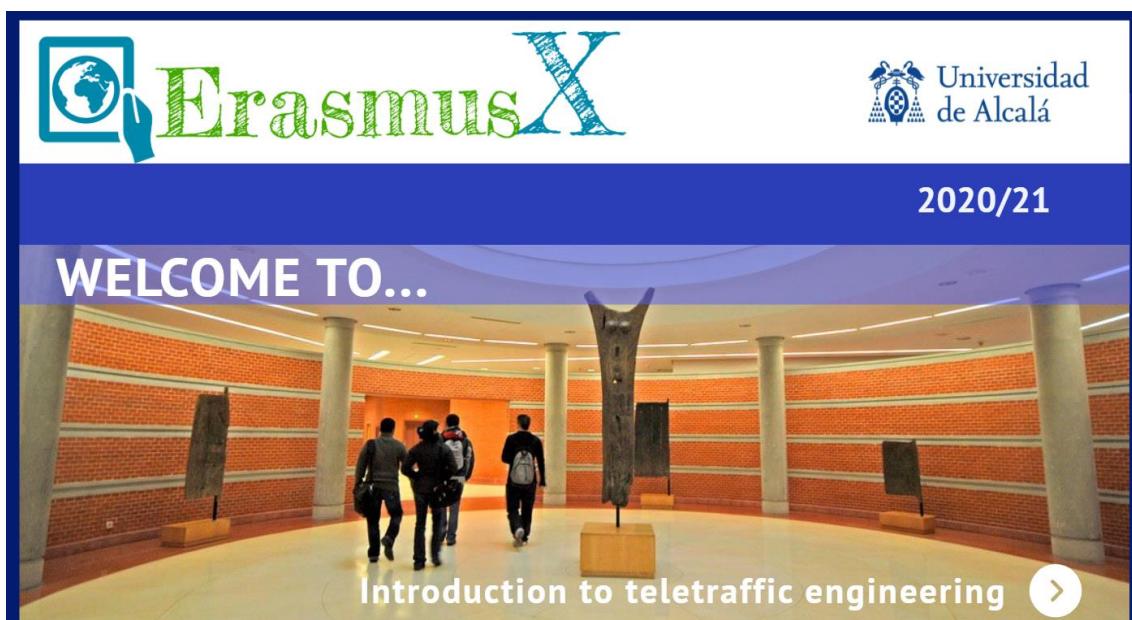
ECTS = 3

Area = Engineering (Telecommunication / Computer Science)

Already existed? Yes, but only partially and in Spanish. The material had to be fully translated first.

### 2 Implementation

The course was initially implemented as a written book, containing self-assessment exercises for the students to practice on their own, as it can be seen in the following screenshots.



## 5.6 Relation between the different delay systems

Although each of the studied delay system is independent of the others, each of them can be seen as a single modification of the simplest and most widely studied system in the teletraffic theory, the  $M/M/1$  system. Then, Fig. 5.10 shows that changing just a feature of the  $M/M/1$  system, it is possible to obtain the rest of delay systems analyzed in the previous sections. For example, if the service time follows a generic distribution instead of an exponential distribution, we obtain a  $M/G/1$  system.

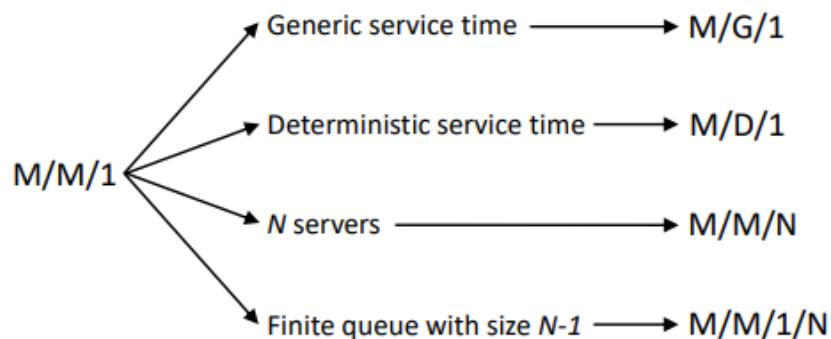


Figure 5.10: Relation among the studied delay systems using the  $M/M/1$  system as reference.

## 5.7 Exercises

For the next exercises consider by default, although otherwise indicated, that the arrival process is Poisson and that the service time is exponentially distributed.

1. It has been observed that, for a delay system without losses, the arrival rate is 10 users per second and that the mean service time is 2 seconds. Compute the mean number of users in the system.

*SOLUTION:*  $E[n] = 20$  users.

2. For a queueing system with infinite waiting capacity, the arrival rate is 10 users per second and the server is able to service 20 users per second. Compute the server utilization.

*SOLUTION:*  $\rho = 0.5$

However, during the academic year, apparently no students were willing to join the course (probably because it had not even been offered before, so many of the students selecting UAH as destination did not know about it before coming). For this reason, we decided to slightly change the strategy and offer additional content, from another existing course of 6 ECTS that usually receives Erasmus+ students. That second course is called “Network Architecture” and belongs to the same area of “Teletraffic Engineering” (same Department and almost same



professors). For this additional content, we recorded all sessions (to have them ready for future students), we implemented Wooclap-based tests for their own assessments and we also created several videos explaining in a summarized and concise way the different theory lessons. Those videos are meant to be visual and appealing to students, and they are all also publicly available in this YouTube channel: <https://www.youtube.com/channel/UCiPcpYGNTd3VYvRur2Lmrdf>

✓ LG (Wed 10-12; weekly) / W12-LG12

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✓ LG (Wed 10-12; weekly) / W11-LG11

---

✓ LG (Wed 10-12; weekly) / W10-LG10

---

✓ LG (Wed 10-12; weekly) / W9-LG9

---

✓ LG (Wed 10-12; weekly) / W8-LG8

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✓ LG (Wed 10-12; weekly) / W7-LG7

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✓ LG (Wed 10-12; weekly) / W6-LG6 (2/2)

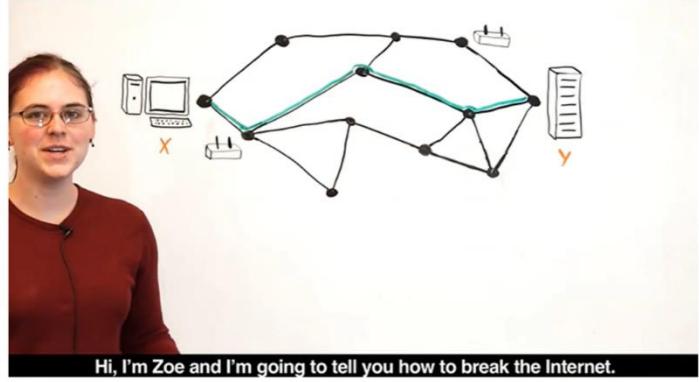
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✓ LG (Wed 10-12; weekly) / W6-LG6 (1/2)

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✓ LG (Wed 10-12; weekly) / W5-LG5

## How to Break the Internet



Hi, I'm Zoe and I'm going to tell you how to break the Internet.

Network Layer

Pausar 0:09 02:00:36

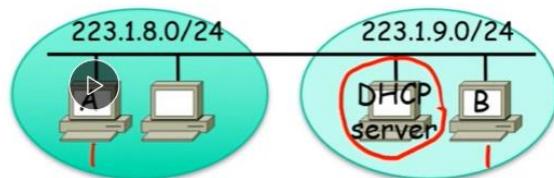
### Twisting DHCP

→ Google "pizza Alcalá"  
 ← mu "~~~~~"

DISCOVER → 255.2

- ❖ #1 Who could get an IP address from the DHCP server?

- A. A
- B. B
- C. Both
- D. None
- E. It depends



- 1. 1. Minimum IP packet length? (in bytes)
- 2. 1. Minimum IP packet length?
- 3. 2. Minimum IP fragment length?
- 4. 3. Minimum IP penultimate fragment length?
- 5. 4. Could the two "extreme" machines communicate?
- 6. 5. Could the two "extreme" machines communicate?
- 7. 6. Could the two "extreme" machines communicate?
- 8. 7. Minimum netmask?
- 9. 8. Minimum netmask?

**Towards an access point**

Frame destination MAC: Frame source MAC: Final destination MAC:  
MA: Source Address, DA: Destination Address, AP: Access Point

9:03

**Frame control**

9:40

**802.1Q frame**

9:51

**Use of addresses in the WiFi frame**

128 visualizaciones • hace 8 meses

**WiFi frame format**

128 visualizaciones • hace 8 meses

**VLAN**

176 visualizaciones • hace 8 meses

**Learning process**

9:24

**MAC addresses**

3:09

**Let's assign addresses**

6:38

**Hubs and Switches**

101 visualizaciones • hace 9 meses

**Ethernet address format**

75 visualizaciones • hace 9 meses

**Addressing V - A simple example of network addresses...**

29 visualizaciones • hace 9 meses



### 3 Results

Unfortunately, no students joined the initial course, but four Erasmus+ students joined the second version of it. They all liked the methodology (visual, concise and challenging), though they found the content slightly difficult (they considered the material was rather advanced). For this reason, our impression is that it should be split in 3 modules of 3 ECTS each, and combined for each incoming students, after studying their previous backgrounds.

The course is still currently available during year 2021/2022 for incoming students. Moreover, the course will be probably leveraged for an online education initiative currently being promoted by the University of Alcala and pioneered by EPS.



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## Annex 2. Summary of implemented courses

University of Napoli Federico II (UNINA)

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## UNINA COURSE #1

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# Power Devices and Circuits course

## Power Circuits module (3 ECTS).

### 1 Context of the course

The course is in the file of **Electronic Engineering**.

The EQF level of the course is **7 (Master degree level)**.

The course is part of the Master degree in Electronic Engineering and is part of the Double Degree for the joint Master degree in Electronic Engineering at the University of Napoli (I) and the master degree in electronics and telecommunications at the Polytechnic University of Lodz (PL). The entire course is 9ECTS and has been divided, for the purpose of the ErasmusX, into two modules: Power Circuits and Power devices. This allows a larger number of Erasmus students to take advantage of the online course.

The **learning objectives** of the entire course, that is composed by the power devices and the power circuits modules, are listed below.

Study of the most important circuits for power conversion and study of the power semiconductor devices exploited in power conversion applications. Analysis and design of high efficiency power conversion circuits. Understanding and determination of the ratings and operating limits for the power circuits and power semiconductor devices. Performance calculation and verification. Application fields for the circuits and the devices.

In the power circuits module, the addressed topics are listed below.

Class A, B, and C power amplifier circuits. Power conversion. Power efficiency. Static and dynamic power dissipation. Circuits for power conversion: DC/DC converters, Buck, Boost, Bridge. Inverters DC/AC. AC/AC converters. Isolated converters: flyback and forward. Driving circuits and snubber circuits.

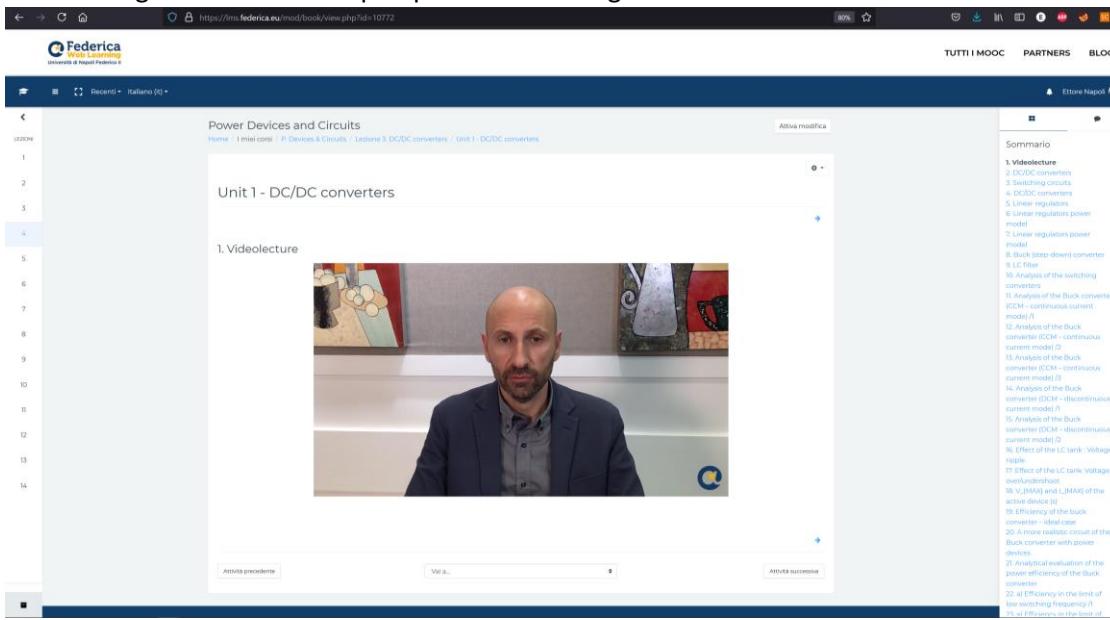
## 2 Implementation

The entire existing course has been reprogrammed moving around the topics to allow the division into two modules.

After the re-organization the course has been ported to the Federica.eu platform (<https://www.federica.eu/en/>). Federica is the proprietary Online Learning platform available at UNINA. Federica holds a large amount of MOOCs.

The Power Devices and Circuits course is a nice addition to the list since the Federica platform lacks in course in English language and this has been also a good opportunity for the staff to familiarize with the new challenge. As an example, the course intro, written by the professor of the course, has been spoken by a professional English voice.

The porting required the creation of the slides decks to be ported into the Federica format and in twenty-six (28) short videos that are introductory to the lessons. The 28 videos are divided into fourteen (14) videos introducing the topics of the lecture and fourteen (14) videos summarizing with items the topics presented through the lecture.



The screenshot shows a Federica.eu course page for 'Power Devices and Circuits'. The left sidebar lists 'LEZIONI' from 1 to 14. The main content area displays 'Unit 1 - DC/DC converters' with a video thumbnail of a man speaking. To the right is a 'Sommaario' (Table of Contents) listing 28 numbered items related to video lectures and switching converters. At the bottom are navigation buttons for 'Attività precedente', 'Vai a...', and 'Attività successiva'.

Fig. The introductory video to the DC/DC converter lecture.



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The screenshot shows a Moodle-based course page. At the top right, there are links for 'TUTTI I MOOC', 'PARTNERS', and 'BLOG'. Below that is a user profile for 'Ettore Napoli'. The main content area has a title 'Unit 1 - Isolated DC/DC converters'. To the left is a vertical table of contents with numbered items from 1 to 14. In the center is a video player showing a man in a white shirt sitting at a desk. To the right is a sidebar with a table of contents titled 'Sommaio' containing numerous numbered items related to power electronics topics.

Fig. The introductory video to the isolated DC/DC converter lecture.

This screenshot shows another Moodle course page. The title is 'Unit 1 - Snubber circuits'. The central area features a video player with a red overlay containing text: 'Application off the snubber circuits', 'Turn OFF snubber', 'Turn ON snubber', 'Spice simulation of the snubbers', 'Similar concepts', 'Energy recovery snubbers', and 'Voltage clamp snubbers'. To the left is a vertical table of contents, and to the right is a sidebar with a table of contents titled 'Sommaio' containing numbered items related to snubber circuits.

Fig. The summary video for the snubber circuit lecture.

Also, an introductory text has been written by the professor, then filled with images and acted by a professional voice to be a presentation of the course.

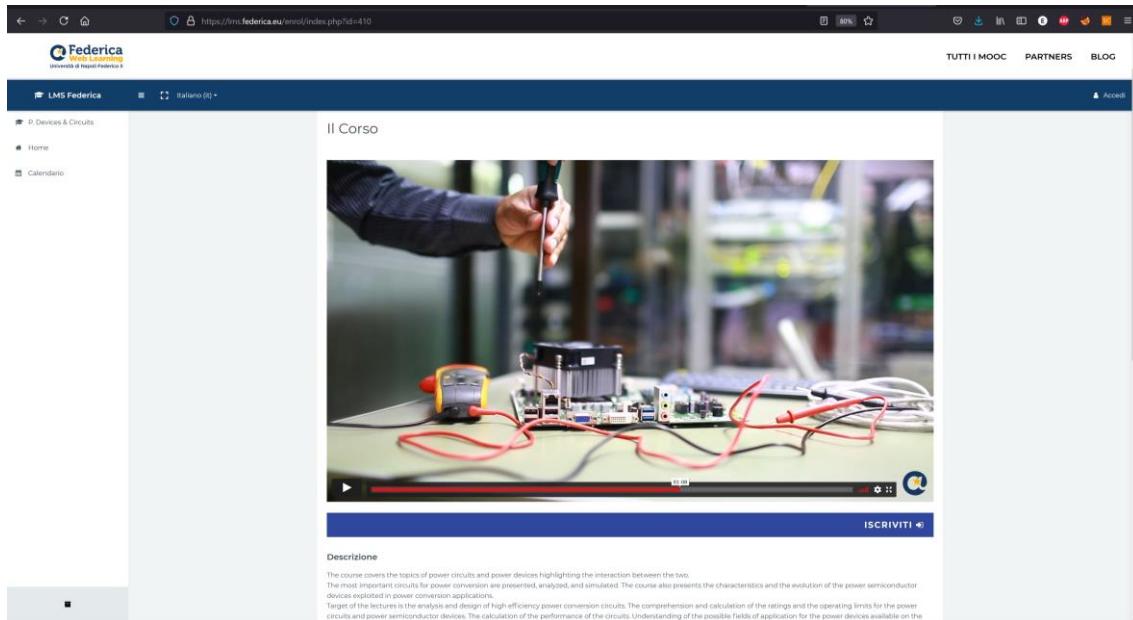


Fig. The video introducing the entire course to the students. This video is visible without enrolling to the course or into Federica.eu. The text has been written by the professor. Video and voice over acting is devote to professional working for Federica.eu.

## 2.1 Below a short summary of the lectures.

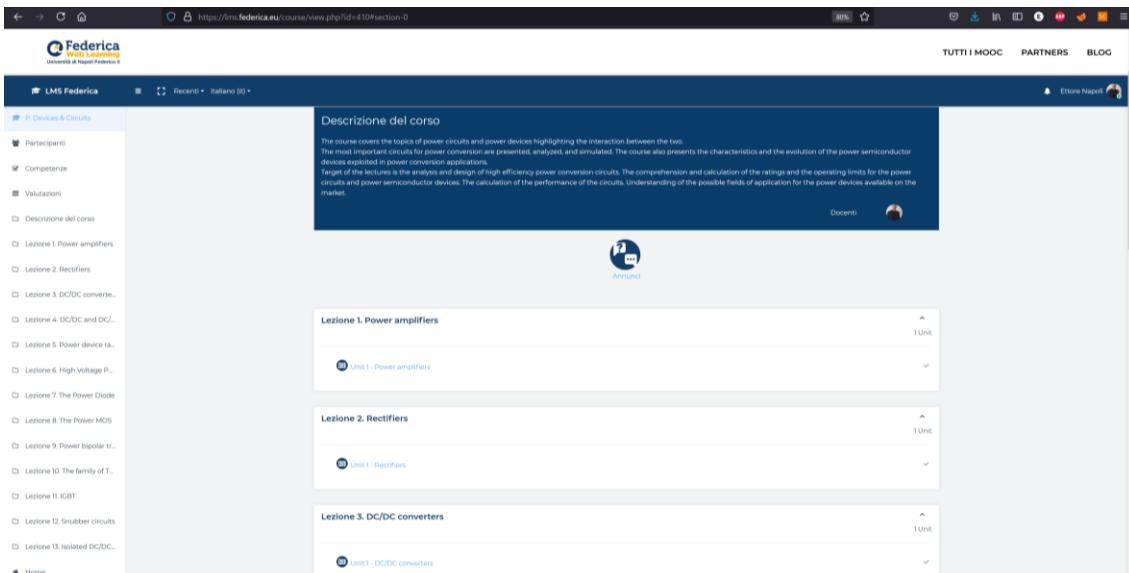
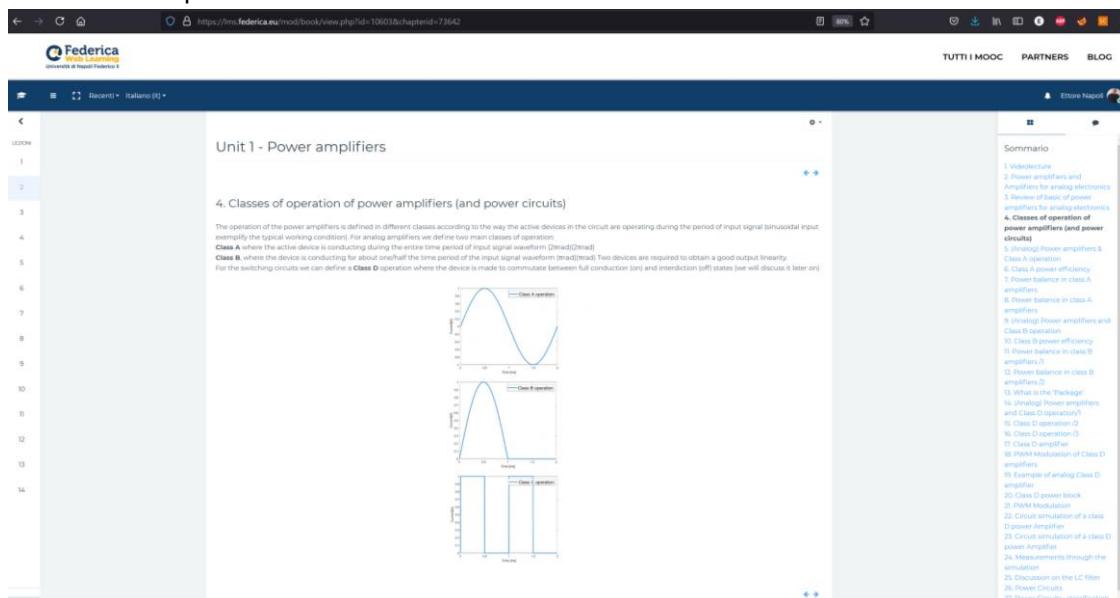

 A screenshot of the LMS Federica website showing the course structure for 'P. Devices & Circuits'. On the left, there is a sidebar with navigation links such as 'Partecipanti', 'Competenze', 'Valutazioni', 'Lezione 1: Power amplifiers', 'Lezione 2: Rectifiers', 'Lezione 3: DC/DC converters', 'Lezione 4: DC/DC and DC...', 'Lezione 5: Power device ra...', 'Lezione 6: High Voltage P...', 'Lezione 7: The Power Diode', 'Lezione 8: The Power MOS', 'Lezione 9: Power bipolar tr...', 'Lezione 10: The family of T...', 'Lezione 11: IGBT', 'Lezione 12: Snubber circuits', and 'Lezione 13: Isolated DC/DC...'. The main content area displays three sections: 'Lezione 1. Power amplifiers', 'Lezione 2. Rectifiers', and 'Lezione 3. DC/DC converters', each with a corresponding video thumbnail and unit number (1 Unit).

Fig. The list of lectures for the Power Devices and Circuits course.

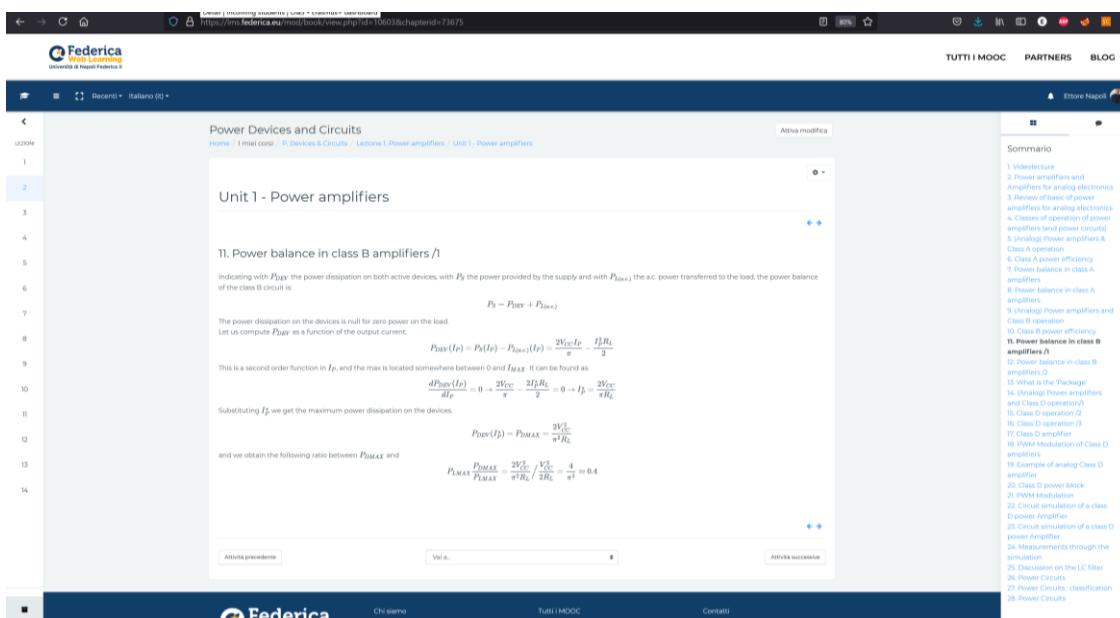
The ported course consists in 14 lectures, some of them shared between the two modules. The list of the topics, together with a brief outline of the content is given below.

- 1) Introduction - Video and slides
- 2) Power amplifiers efficiency and device involvement. Class A. Class B. Class D amplification



Sommario
1. Videolezione
2. Power amplifiers and Amplifiers for analog electronics
3. Review of basic of power amplifiers for analog electronics
4. Classes of operation of power amplifiers (and power circuits)
5. (Analog) Power amplifiers & Class A operation
6. Class A power efficiency
7. Power balance in class A amplifiers
8. Power balance in class A amplifiers
9. Unbiased Power amplifiers and Class D operation/1
10. Class D operation/2
11. Class D operation/3
12. Class D amplifier
13. PWM Modulation of Class D amplifiers
14. Example of analog Class D amplifier
20. Class D power block
21. Circuit simulation of a class D power Amplifier
22. Circuit simulation of a class D power Amplifier
23. Circuit simulation of a class D power Amplifier
24. Measurements through the simulation
25. Discussion on the LC filter
26. Power Circuits
27. Power Circuits: classification

Fig. Slide from the power amplifiers lecture.



Sommario
1. Videolezione
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14. Example of analog Class D amplifier
20. Class D power block
21. Circuit simulation of a class D power Amplifier
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23. Circuit simulation of a class D power Amplifier
24. Measurements through the simulation
25. Discussion on the LC filter
26. Power Circuits
27. Power Circuits: classification
28. Power Circuits

Fig. Slide from the power amplifiers lecture.

### 3) Rectifier circuits

The area (in red) of the current waveform into the conducting diodes is the total charge absorbed from the supply during the T2 period, named  $Q_S$ . It must be equal to the charge provided to the load:  $Q_L = I_L \cdot T/2$ . Assuming a triangular shape for the diode current whose peak value is  $I_{Dg}$ , we have:

$$Q_S = Q_L \Rightarrow I_L \frac{T}{2} = I_{Dg} \frac{T_{d1}}{2} \rightarrow I_L \frac{T}{T_{d1}}$$

For high RC values  $T_{d1}$  will decrease and then the current peak into the diodes can be unacceptably large, leading to a large voltage drop across the diodes and to a decrease of the power efficiency of the circuit.

If  $D_C = 50\%$  is chosen, the ripple factor is 1/100 of the d.c. value and  $\text{PER}$  is about 50%.

Fig. Slide from the power rectifiers lecture.

12. Full wave rectifier with diode bridge: code for the simulation

```

* Bridge_rectifier_IdealDiode.acs
D1 13a out myD
D2 0 13a myD
D3 13b out myD
D4 0 13b myD
R1 13a 13b 100
V1 13a 13b SIN(0 18.4V 50Hz)
C1 out 0 50nF
L1 out 0 10mH
.model myD Diode=11
.pwl
.mos tr1 max(Vout) trig at 20ms targ at 200ns
.mes tran max(Vout) max V(out) trig at 20ms targ at 200ns
.mes tran max(Vout) max V(out) trig at 20ms targ at 200ns
.mes tran Vripple param maxVout=minVout
.mes tran lind net "13b" trig at 80ms targ at 100ns
.mes tran lind net "13b" trig at 80ms targ at 100ns
.mes tran lind net "13b" trig at 80ms targ at 100ns
.mes tran lind net "13b" trig at 80ms targ at 100ns
.mes tran lind net "13b" trig at 80ms targ at 100ns
.mes tran lind net "13b" trig at 80ms targ at 100ns
.mes tran lind net "13b" trig at 80ms targ at 100ns
.mes tran t1 WMM 1(C1)+1(R1)+3*peak/10 cross0
.mes tran s2 WMM 1(C1)+1(R1)+3*peak/10 cross4
.mes tran t3 WMM 1(C1)+1(R1)+3*peak/10 cross8
.mes tran Pin avg -1(v1)*V(m1,inh) trig at 80ms targ at 100ns
.mes tran Rff param P1/Pin
.bend
.end

```

Fig. Slide from the power rectifiers lecture.

### 4) DC/DC Converters (1)

Linear regulators, Step Down - link to Spice simulation, Step Up - link to Spice simulation

https://lms.federica.eu/mod/book/view.php?id=10772&chapterid=75029

TUTTI I MOOC PARTNERS BLOG

Ettore Napoli

13. Analysis of the Buck converter (CCM – continuous current mode) /5

If the output current  $I_{L\text{off}}$  is too low, due to an increase of the load resistance, or a small value of  $V_0$  for low duty cycle the situation shown in the top figure arise. In this condition, the output voltage is not only dependent on the duty cycle  $D$ , but it is also dependent on the load current  $I_L$ . Let us define the minimum output current  $I_{L\text{min}}$  that gives a current  $I_L > 0$  for the whole  $T$  period, with reference to the bottom figure, by referring to the  $\text{tOHM}$  ( $I_{L\text{off}} = I_{\text{tOHM}}$ )

$$V_L - V_0 = L \frac{\Delta I}{\Delta T} - I \frac{T_{\text{OFF}}}{T} = L \frac{2I_{\text{tOHM}}}{T}$$

$$I_{\text{tOHM}} = \frac{V_L - V_0}{2L} T_{\text{OFF}} = \frac{V_L - D V_0}{2L} T_{\text{ON}} = V_L \frac{(1-D)D}{2L}$$

$I_{\text{tOHM}}$  depends on the inductance value and on the duty cycle  $D$  for a given  $V_L$  the largest value is obtained for  $D = 50\%$ .

Sommario

- 1. Videolezione
- 2. DC/DC converters
- 3. DC/DC converters
- 4. DC/DC converters
- 5. Linear regulators
- 6. Linear regulators power
- 7. Linear regulators power
- 8. Linear regulators power model
- 9. LC tank
- 10. Analysis of the switching converters
- 11. Analysis of the Buck converter (CCM – continuous current mode) 1
- 12. Analysis of the Buck converter (CCM – continuous current mode) 2
- 13. Analysis of the Buck converter (CCM – continuous current mode) 3
- 14. Analysis of the Buck converter (DCM – discontinuous current mode)
- 15. Analysis of the Buck converter (DCM – discontinuous current mode) 2
- 16. Effect of the LC tank - voltage ripple
- 17. Effect of the LC tank - voltage overshoot
- 18. Efficiency of the buck converter - ideal case
- 19. Efficiency of the buck converter with power devices
- 20. Analytical evaluation of the power efficiency of the buck converter
- 21. at Efficiency in the limit of the inductor magnetization
- 22. Efficiency in the limit of

Fig. Slide from the DC/DC converters lecture.

## 5) DC/DC Converters (2)

Bridge converter, Inverter ->Spice simulation, High side devices Driving

## 6) Snubber circuits

Applications, Turn off snubbers, Turn on snubbers

https://lms.federica.eu/mod/book/view.php?id=11152&chapterid=76824

TUTTI I MOOC PARTNERS BLOG

Ettore Napoli

Power Devices and Circuits

Unit 1 - Snubber circuits

9. Circuit simulation (loci)

Sommario

- 1. Videolezione
- 2. Power losses for inductive load
- 3. Snubber circuits 1
- 4. Snubber circuits 2
- 5. Snubber circuits 3
- 6. Turn-off snubber circuit 4
- 7. Turn-off snubber circuit 5
- 8. Turn-on snubber circuit
- 9. Circuit simulation (loci)
- 10. Circuit simulation (values) 1
- 11. Circuit simulation (values) 2
- 12. Energy recovery snubber
- 13. Voltage clamp snubber
- 14. Turn-on snubber circuit 1
- 15. Turn-on snubber circuit 2
- 16. Circuit simulation (Waveform)
- 17. Circuit simulation (loci)
- 18. Circuit simulation (values)
- 19. Suggested reading

Fig. Simulated behavior of the snubber circuits.

## 7) Isolated Converters

Motivation and classification, Flyback converter, Forward converter

The screenshot shows a Moodle-based online lecture slide. The title is "Unit 1 - Isolated DC/DC converters". The current slide is "9. Flyback converter /3". The slide content includes a schematic diagram of a Flyback converter with a transformer having two windings, primary and secondary, connected to a full-bridge switch and a diode. The output voltage  $V_o$  is indicated across the load resistor  $R_L$ . Below the diagram, there is a note: "STEP 4: Completes the transition to the Flyback circuit. Move the switch. In the new position the "low side" driving is possible (easier). In the previous position it was an "high side" device (more complex driving)." A second schematic diagram shows the switch moved to the "low side" position. The right sidebar contains a "Sommarario" (Table of Contents) listing various topics related to isolated converters.

Fig. Slide from the isolated converters lecture.

### 3 Results

The structure of the course and the treated topic are of great interest for many students.

The created online, asynchronous learning support will be useful in various scenarios.

- 1) The students that are enrolled at UNINA for the Master in Electronic Engineering. Around 30 per year. These students will benefit from the asynchronous learning having the lectures available when the actual lecturing is concluded. The different presentation format will also help the learning process.
- 2) Students enrolled to the Double Degree. Around 10 per year. These students are particularly in need of additional learning supports since do not come from the bachelor at UNINA and hence miss some topic or a yet familiar with other ones.
- 3) Erasmus students. 5 per year yet shown interest for the topic and benefit from the fact that the online lectures are available also in the spring semester. This number is expected to increase in the next years.

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## UNINA COURSE #2

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# Power Devices and Circuits course

## Power Devices module (6 ECTS).

### 1 Context of the course

The course is in the file of **Electronic Engineering**.

The EQF level of the course is **7 (Master degree level)**.

The course is part of the Master degree in Electronic Engineering and is part of the Double Degree for the joint Master degree in Electronic Engineering at the University of Napoli (I) and the master degree in electronics and telecommunications at the Polytechnic University of Lodz (PL). The entire course is 9ECTS and has been divided, for the purpose of the ErasmusX, into two modules: Power Circuits and Power devices. This allows a larger number of Erasmus students to take advantage of the online course.

The **learning objectives** of the entire course, that is composed by the power devices and the power circuits modules, are listed below.

Study of the most important circuits for power conversion and study of the power semiconductor devices exploited in power conversion applications. Analysis and design of high efficiency power conversion circuits. Understanding and determination of the ratings and operating limits for the power circuits and power semiconductor devices. Performance calculation and verification. Application fields for the circuits and the devices.

In the power devices module, the addressed topics are listed below.

Class A, B, and C power amplifier circuits. Power conversion. Power efficiency. Static and dynamic power dissipation. Device ratings. Device thermal impedance and thermal resistance. Safe Operating Area. Power semiconductor devices. Rectifiers: PiN diode and Schottky diode. Controlled rectifiers: SCR, GTO. Bipolar controller devices: BJT. Voltage controller devices: MOS and IGBT. Current and voltage limitations. Superjunction devices. Transient behavior for power semiconductor devices.

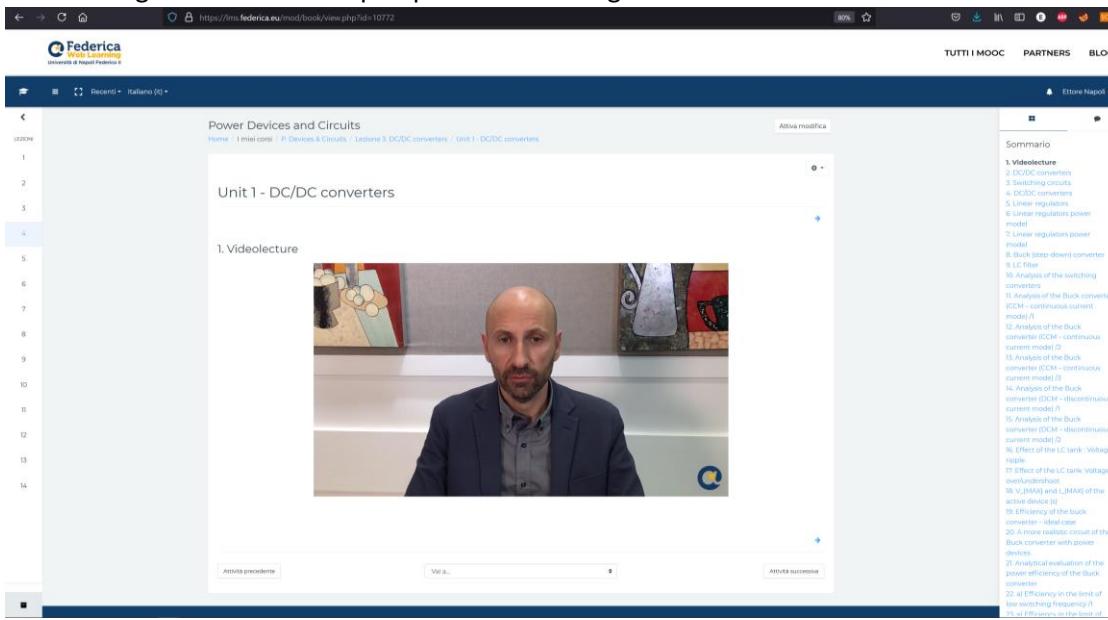
## 2 Implementation

The entire existing course has been reprogrammed moving around the topics to allow the division into two modules.

After the re-organization the course has been ported to the Federica.eu platform (<https://www.federica.eu/en/>). Federica is the proprietary Online Learning platform available at UNINA. Federica holds a large amount of MOOCs.

The Power Devices and Circuits course is a nice addition to the list since the Federica platform lacks in course in English language and this has been also a good opportunity for the staff to familiarize with the new challenge. As an example, the course intro, written by the professor of the course, has been spoken by a professional English voice.

The porting required the creation of the slides decks to be ported into the Federica format and in twenty-six (28) short videos that are introductory to the lessons. The 28 videos are divided into fourteen (14) videos introducing the topics of the lecture and fourteen (14) videos summarizing with items the topics presented through the lecture.



The screenshot shows a Federica.eu course page for 'Power Devices and Circuits'. The left sidebar lists 'LEZIONI' from 1 to 14. The main content area displays 'Unit 1 - DC/DC converters' with a video thumbnail of a man speaking. To the right is a 'Sommaario' (Table of Contents) listing 28 numbered items related to DC/DC converters, including topics like 'Videolezione', 'Switching circuits', 'DC/DC converters', and various analysis and design models.

Fig. The introductory video to the DC/DC converter lecture.



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The screenshot shows a Moodle-based course page. At the top, there's a header with the Federica logo and navigation links for 'TUTTI I MOOC', 'PARTNERS', and 'BLOG'. Below the header, the course title 'Power Devices and Circuits' is visible, along with the specific unit 'Unit 1 - Isolated DC/DC converters'. A video player is embedded in the page, showing a thumbnail of a man speaking. To the right of the video player is a sidebar containing a table of contents for the course, which includes sections like 'Videolecture', 'Isolated DC/DC converters', and various sub-topics related to power conversion.

Fig. The introductory video to the isolated DC/DC converter lecture.

The screenshot shows another Moodle-based course page. The title 'Unit 1 - Snubber circuits' is displayed at the top. A video player is shown with a red overlay containing text related to snubber circuits, such as 'Application off the snubber circuits', 'Turn OFF snubber', 'Turn ON snubber', 'Spice simulation of the snubbers', and 'Similar concepts Energy recovery snubbers Voltage clamp snubbers'. To the right of the video player is a sidebar with a table of contents for the course, listing topics from 'Videolecture' to 'Suggested reading'.

Fig. The summary video for the snubber circuit lecture.

Also, an introductory text has been written by the professor, then filled with images and acted by a professional voice to be a presentation of the course.

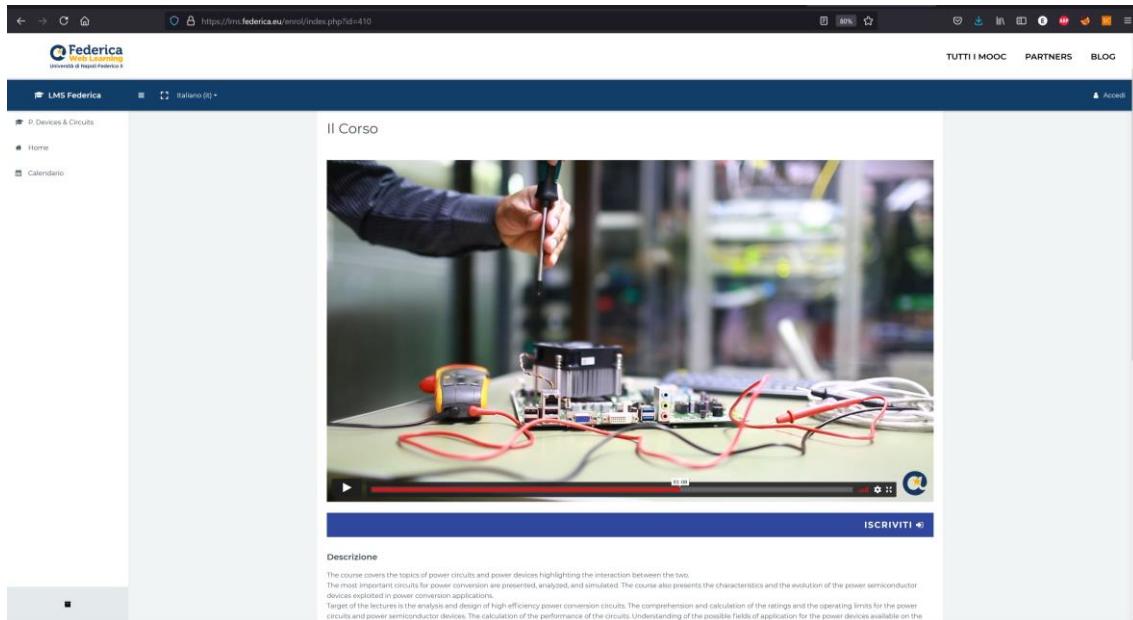


Fig. The video introducing the entire course to the students. This video is visible without enrolling to the course or into Federica.eu. The text has been written by the professor. Video and voice over acting is devote to professional working for Federica.eu.

## 2.1 Below a short summary of the lectures.

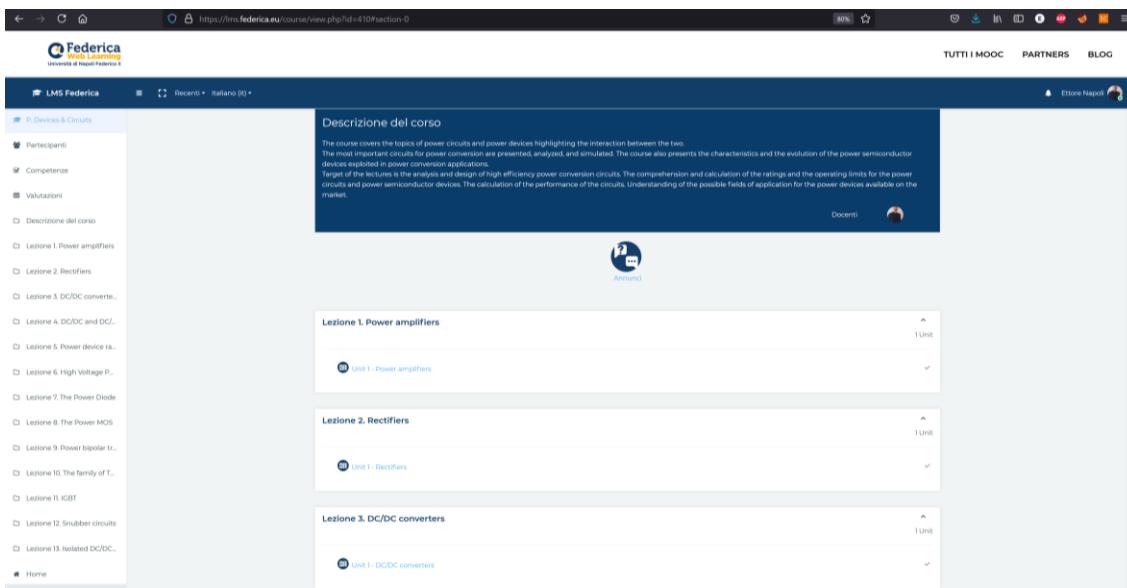

 A screenshot of a web browser displaying the 'Lezioni' (Lessons) section of the LMS Federica platform. On the left, there is a sidebar with a tree view of course contents: 'P- Devices & Circuits' is expanded, showing 'Partecipanti', 'Competenze', 'Valutazioni', 'Descrizione del corso', 'Lezione 1: Power amplifiers', 'Lezione 2: Rectifiers', 'Lezione 3: DC/DC converters', 'Lezione 4: DC/DC and DC...', 'Lezione 5: Power device ra...', 'Lezione 6: High Voltage P...', 'Lezione 7: The Power Diode', 'Lezione 8: The Power MOS', 'Lezione 9: Power bipolar tr...', 'Lezione 10: The family of T...', 'Lezione 11: IGBT', 'Lezione 12: Snubber circuits', and 'Lezione 13: Isolated DC/DC...'. The main content area shows three sections: 'Lezione 1. Power amplifiers', 'Lezione 2. Rectifiers', and 'Lezione 3. DC/DC converters', each with a 'Unit 1' link. At the top right, there are links for 'TUTTI I MOOC', 'PARTNERS', and 'BLOG'. The URL in the address bar is https://lms.federica.eu/course/view.php?id=410&section=0.

Fig. The list of lectures for the Power Devices and Circuits course.

The ported course consists in 14 lectures, some of them shared between the two modules. The list of the topics that refer to the Power Devices module, together with a brief outline of the content, is given below.

- 8) Introduction - Video and slides
- 9) Power amplifiers efficiency and device involvement. Class A. Class B. Class D amplification

Fig. Slide from the power amplifiers lecture.

Fig. Slide from the power amplifiers lecture.

## 10) Power device ratings

## SOA definition, Thermal resistance, Thermal impedance

### 11) High voltage PN Junctions

#### Reverse biased PN junction - Avalanche breakdown, Breakdown calculation (examples), Junction termination

The screenshot shows a slide titled "Unit 1 - High Voltage PN Junction" under the heading "28. Junction termination techniques /". It discusses the decrease of the VBR value due to lateral junction curvature and two techniques: Floating field rings and Field plates. A diagram illustrates a floating ring structure around a P+ anode region. The slide also includes mathematical equations for the Poisson equation and boundary conditions.

Fig. Slide from termination techniques topic.

### 12) PIN diode - Device structure, PIN IV characteristics, PIN dynamic behavior

The screenshot shows a slide titled "19. Turn-off transient /". It explains the reverse recovery process in PIN diodes, showing current-voltage curves and carrier distribution diagrams. The slide includes a graph of current I<sub>P</sub> versus time t during turn-off, highlighting parameters like t<sub>off</sub>, t<sub>rec</sub>, and di/dt.

Fig. Slide discussing the reverse recovery in PiN power diodes.

### 13) Power MOS

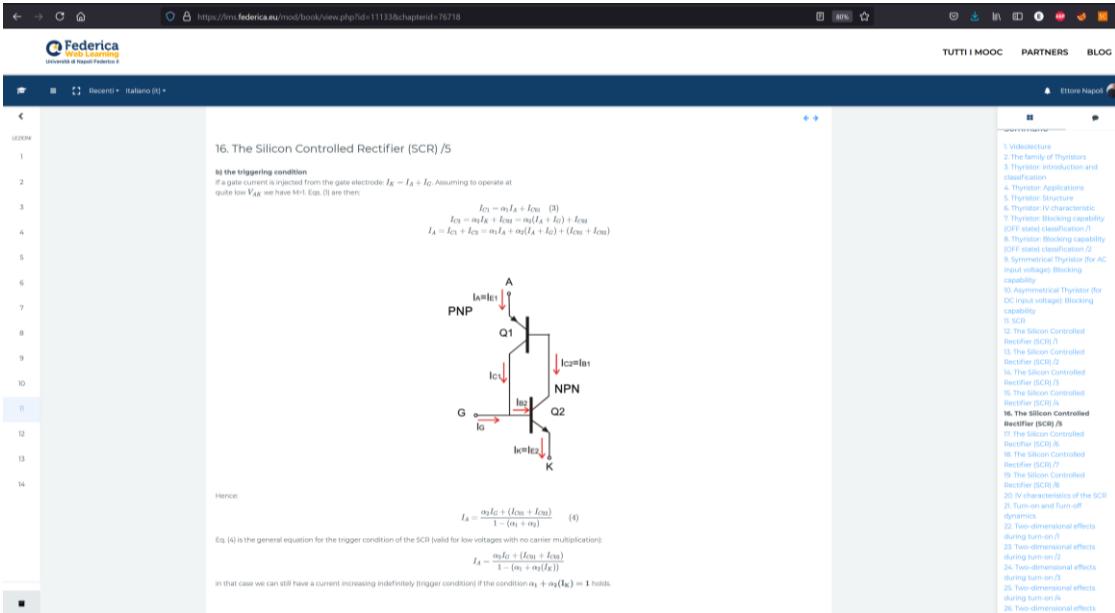
## Structure – working principle, ON state resistance medium voltage limitations- advanced structures, Power MOS SOA

### 14) BJT

Structure – working principle, Gain limitation: high currents gain, quasi saturation, transverse effects, BVCBO and BVCEO, Thermal limitations and SOA, Dynamic behavior

### 15) Silicon Controlled rectifiers (SCR)

Structure – working principle, Forward and reverse blocking, Latch up current and ON state voltage drop, Dynamic behavior and  $dI/dt$   $dV/dt$  limitations.



16. The Silicon Controlled Rectifier (SCR) /5

b) the triggering condition

If a gate current is injected from the gate electrode:  $I_g = I_A + I_G$ . Assuming to operate at quite low  $V_{AK}$  we have M-H. Eqs. (1) are then:

$$I_{C1} = \alpha_1 I_A + I_{C01} \quad (3)$$

$$I_{C2} = \alpha_2 I_A + I_{C02} = \alpha_2(I_A + I_G) + I_{C02}$$

$$I_A = I_{C1} + I_{C2} = \alpha_1 I_A + \alpha_2(I_A + I_G) + (I_{C01} + I_{C02})$$

Hence:

$$I_A = \frac{\alpha_2 I_G + (I_{C01} + I_{C02})}{1 - (\alpha_1 + \alpha_2)} \quad (4)$$

Eqs. (4) is the general equation for the trigger condition of the SCR (valid for low voltages with no carrier multiplication):

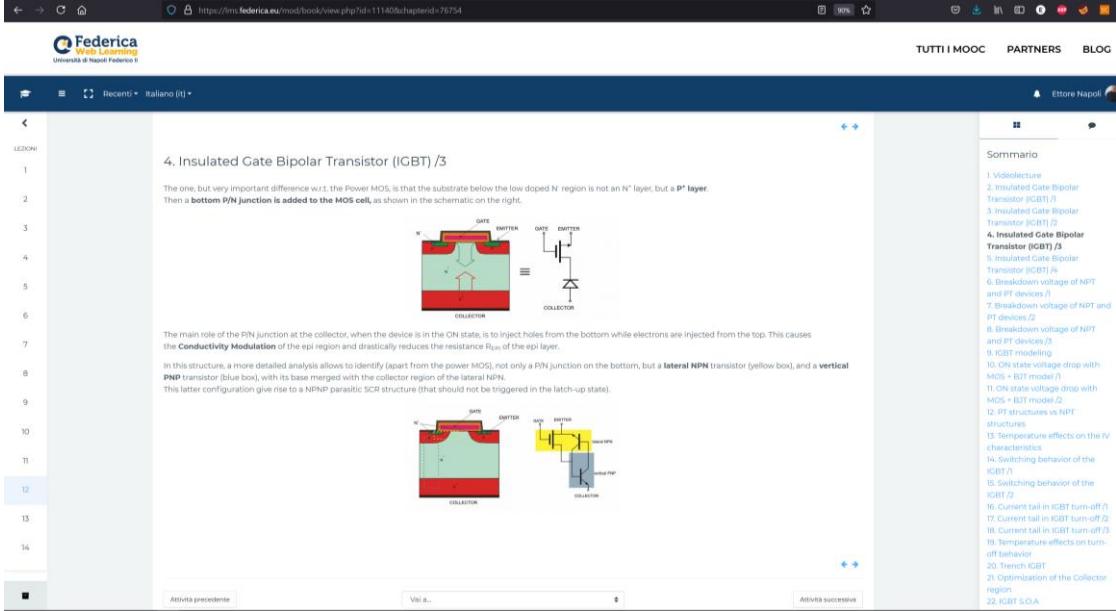
$$I_A = \frac{\alpha_2 I_G + (I_{C01} + I_{C02})}{1 - (\alpha_1 + \alpha_2)(I_A)}$$

In that case we can still have a current increasing indefinitely (trigger condition) if the condition  $\alpha_1 + \alpha_2(I_A) = 1$  holds.

Fig. The thyristor model composed by two bipolar junction transistors.

### 16) IGBT

Structure – working principle, IV characteristics and model, Dynamic behavior – current tail and design, Latch up.



The screenshot shows a MOOC page from Federica.eu. The left sidebar lists 'LEZIONI' numbered 1 to 14. The main content area is titled '4. Insulated Gate Bipolar Transistor (IGBT) /3'. It contains a text block about the IGBT structure, a diagram of the cross-section with labels for Gate, Emitter, Collector, and a bottom P/N junction, and a schematic symbol. To the right is a 'Sommario' (Table of Contents) listing 22 items related to IGBTs.

Fig. The IGBT structure and its possible models.

### 3 Results

The structure of the course and the treated topic are of great interest for many students.

The created online, asynchronous learning support will be useful in various scenarios.

- 4) The students that are enrolled at UNINA for the Master in Electronic Engineering. Around 30 per year. These students will benefit from the asynchronous learning having the lectures available when the actual lecturing is concluded. The different presentation format will also help the learning process.
- 5) Students enrolled to the Double Degree. Around 10 per year. These students are particularly in need of additional learning supports since do not come from the bachelor at UNINA and hence miss some topic or a yet familiar with other ones.
- 6) Erasmus students. 5 per year yet shown interest for the topic and benefit from the fact that the online lectures are available also in the spring semester. This number is expected to increase in the next years.

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## UNINA COURSE #3

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# Design of digital circuits on FPGA using Verilog course

## Verilog HDL for synthesis module (6 ECTS)

### 1 Context of the course

The course is in the file of **Electronic Engineering**.

The EQF level of the course is **6 (Bachelor degree level)**.

The course is part of the Laurea degree in Electronic Engineering (bachelor) given at the University of Napoli Federico II (Italy). The entire course is 9ECTS and has been divided, for the purpose of the ErasmusX, into two modules: FPGA oriented design (3 ECTS) and Verilog HDL for synthesis (6 ECTS). This allows a larger number of Erasmus students to take advantage of the online course.

The **learning objectives** of the entire course, that is composed by the Verilog HDL for synthesis module and the FPGA oriented design module, are listed below.

Design of digital electronic systems based on programmable devices such as FPGA and CPLD. The course also provides the knowledge of the HDL Verilog language. The lectures detail: the design flow for FPGA and CPLD; timing for synchronous digital circuits; packages; classification, evolution and examples of commercial devices for Simple PLD, CPLD and FPGA devices; adders and arithmetic circuits implemented on FPGA and CPLD; Verilog hardware description languages for the design of combinational and sequential circuits. Verilog hardware description languages for the design of finite state machines and arithmetic circuits; I/O programmable circuitry for FPGA devices.

In the Verilog HDL for synthesis module, the addressed topics are listed below.

Design flow for digital circuits. Verilog hardware description languages for the design of combinational and sequential circuits. Verilog hardware description languages for the design of finite state machines and arithmetic circuits. The Quartus II software suite for FPGA design. Synchronization of sequential circuits. Power dissipation sources in FPGA devices. Tools and estimation techniques for FPGA power dissipation.

## 2 Implementation

The entire existing course, give in Italian and named “Sistemi elettronici programmabili” (that could be translated as “programmable electronic systems”) has been modified moving around the topics to allow the division into two modules. The lecture content has been renovated and translated in English.

After the re-organization, the course has been ported to the Federica.eu platform (<https://www.federica.eu/en/>). Federica is the proprietary Online Learning platform available at UNINA. Federica holds a large amount of MOOCs.

The Design of digital circuits on FPGA using Verilog is a nice addition to the list since the Federica platform lacks in course in English language and this has been also a good opportunity for the staff to familiarize with the new challenge. As an example, the course intro, written by the professor of the course, has been spoken by a professional English voice.

Also the English setup of the ancillary course choices has been tested and corrected through the development of the course.

The porting required the creation of the slides decks to be ported into the Federica format and in twenty-six (30) short videos that are introductory to the lessons. The 30 videos are divided into fourteen (15) videos introducing the topics of the lecture and fourteen (15) videos summarizing with items the topics presented through the lecture.

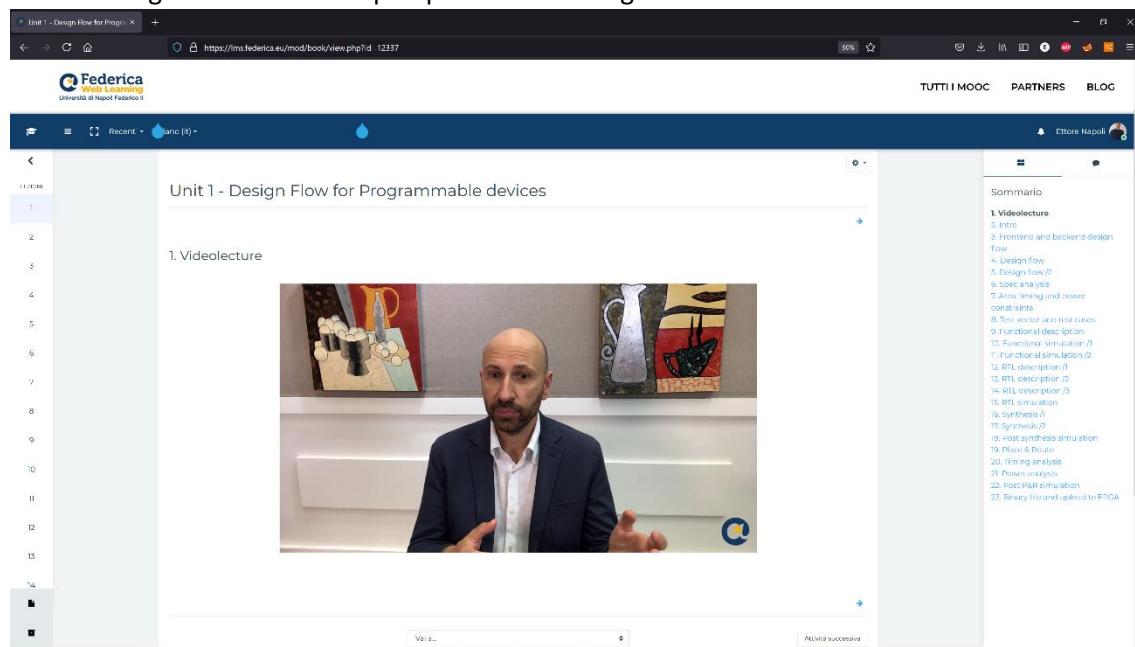


Fig. The video that introduces the first lecture. The design flow.

Also, an introductory text has been written by the professor, then filled with images and acted by a professional voice to be a presentation of the course. The text of the introductory video is the following:

*The newest processor in your cellphone allows better and better video quality to record the wonderful moments with your friends. The shining brand-new GPU has astonishing speed for your exciting hyper-realistic gaming.*

*Would you like to join a company that designs such high-performance digital circuits like Intel, Nvidia, or ARM?*

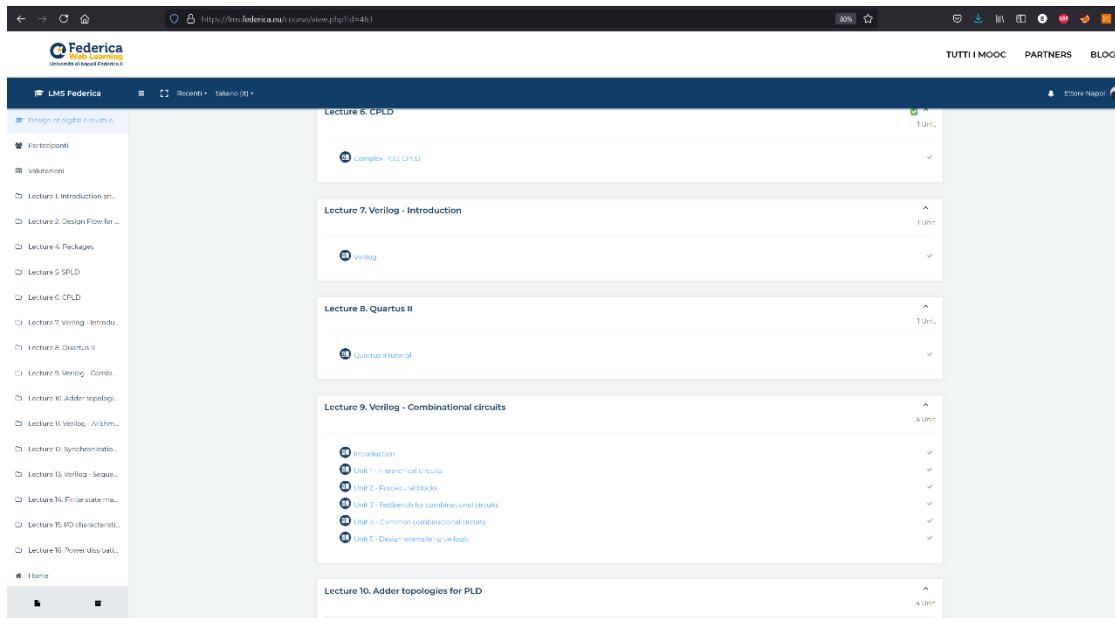
*Would you prefer to start your own company since you have a fantastic idea for a circuit that only needs your brain and an affordable technology to be born?*

*This course will guide you thorough the only successful way to design digital circuits, a skill that is needed for each one of those jobs. The course will also teach how to use an FPGA, a technology that is the only choice for new ideas to be benchmarked and for prototypes to be tested.*

*Finally, the course will teach the Verilog HDL, a standard de facto language for the design of digital circuits.*

*If these topics interest you, follow this course on Federica.eu*

## 2.1 A short summary of the lectures



The screenshot shows the Federica.eu LMS interface. On the left, there's a sidebar with a navigation menu containing items like 'Design of digital circuits on...', 'Verilog', 'Quartus II', and 'Power dissipation'. The main content area displays a list of 10 lectures:

- Lecture 6: CPLD
  - Complex PLD/CLD
- Lecture 7: Verilog - Introduction
  - Verilog
- Lecture 8: Quartus II
  - Quartus Material
- Lecture 9: Verilog - Combinational circuits
  - Introduction
  - Unit 1 - Inverational circuits
  - Unit 2 - Product-of-sums
  - Unit 3 - Testbenches for combinational circuits
  - Unit 4 - Common combinational circuits
  - Unit 5 - Design examples in Verilog
- Lecture 10: Adder topologies for PLD
  - 4 Unit

Fig. The list of lectures for the design of digital circuits on FPGA using Verilog course.

The ported course consists in 16 lectures, some of them shared between the two modules. The list of the topics Verilog HDL for synthesis module (6 ECTS), together with a brief outline of the content is given below.

- 1) Introduction. Digital Design, Implementation targets, FPGA

## 2) Digital design flow. Front end, back end, design example

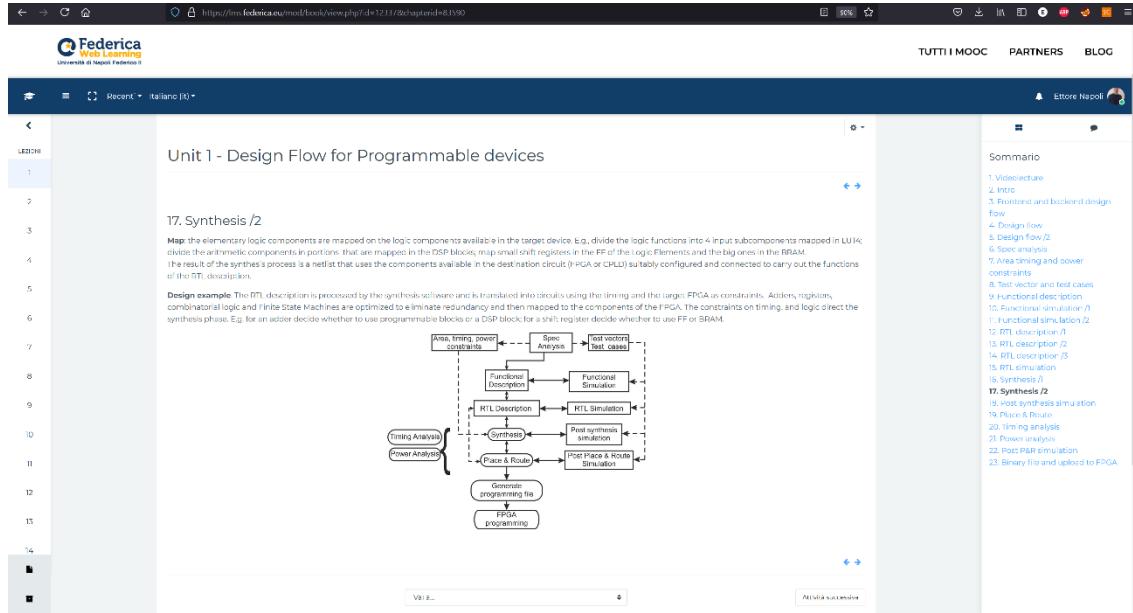


Fig. Slide of the design flow lecture.

## 3) Verilog. Introduction to the language.

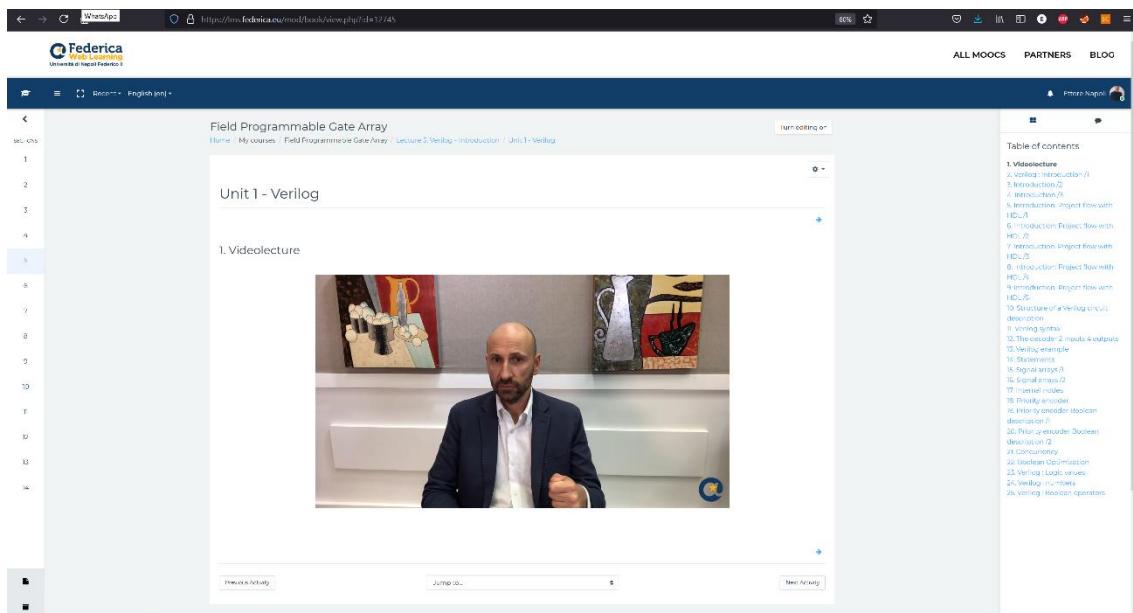


Fig. A frame of the introductory video to the Verilog HDL language.



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The screenshot shows a web-based Verilog code editor. The code is as follows:

```

16. Signal arrays /2
module top();
    // Direct instantiation of the top Verilog schematic
    input [3:0] A; // These are free pins coming from the top-level
    output [3:0] Y;
    wire [1:0] A;
    wire [1:0] B;

    assign Y[0] = A[3]; // The bottom functions
    assign Y[1] = A[2];
    assign Y[2] = A[1];
    assign Y[3] = A[0];

    endmodule

// Syntax: [<constant>:<constant>] #<bit width> <bit width>
// Input [3:0] add; #2 bit bus
// Input [2:0] add; #3 bit bus
// Input #3 add; #2 bit bus (not suggested)

```

The interface includes a table of contents on the right side, navigation buttons at the top, and a footer with the Federica Web Learning logo and various links.

Fig. A slide with some basic Verilog code.

#### 4) Introduction to QuartusII

The screenshot shows a Quartus II testbench setup dialog box. A red arrow points to the 'Name of the testbench file' field, which contains the value 'decade\_B'. The dialog box also shows options for creating a new test bench, selecting a top-level module, and choosing simulation parameters.

Fig. The point to point Quartus II tutorial.

- 5) Verilog HDL for combinational circuits. Hierarchy, Procedural blocks, Combinational testbench, Combinational circuits, HDL description for LUT.
- 6) Verilog HDL for arithmetic circuits. Truncation, rounding, adders, subtractors, multipliers, MAC.

IEEE 754	Verilog
Number of bits	32 bits
Sign bit	1 bit
Exponent	8 bits
Mantissa	23 bits
Significand	24 bits
Normalized	Yes
Normalized	Yes
Range	$-2^{127} \dots 2^{127}$
Range	$-2^{31} \dots 2^{31}$
Precision	~15 digits
Precision	~18 digits
Overflow	Yes
Overflow	Yes
Underflow	Yes
Underflow	Yes
NaN	1 bit
NaN	1 bit
Inf	1 bit
Inf	1 bit

Fig. Slide discussing the number formats for FPGA.

7) Synchronization of sequential circuits. Clock management. Imposing the timing constraints for the synthesis of digital circuits.

Fig. Slide from the lecture regarding the synchronization of the sequential systems.

8) Verilog HDL for sequential circuits. Sequential circuits, sequential testbenches.

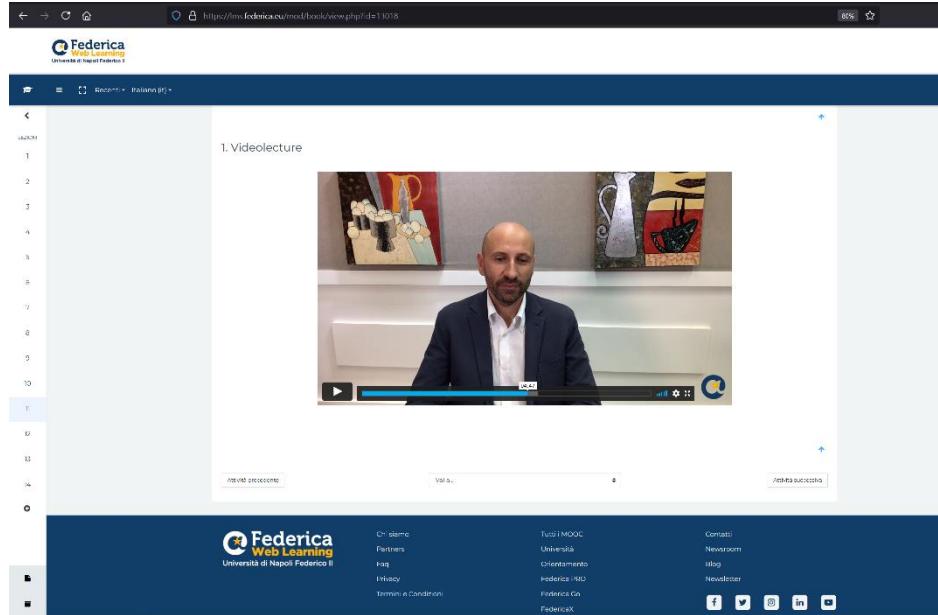
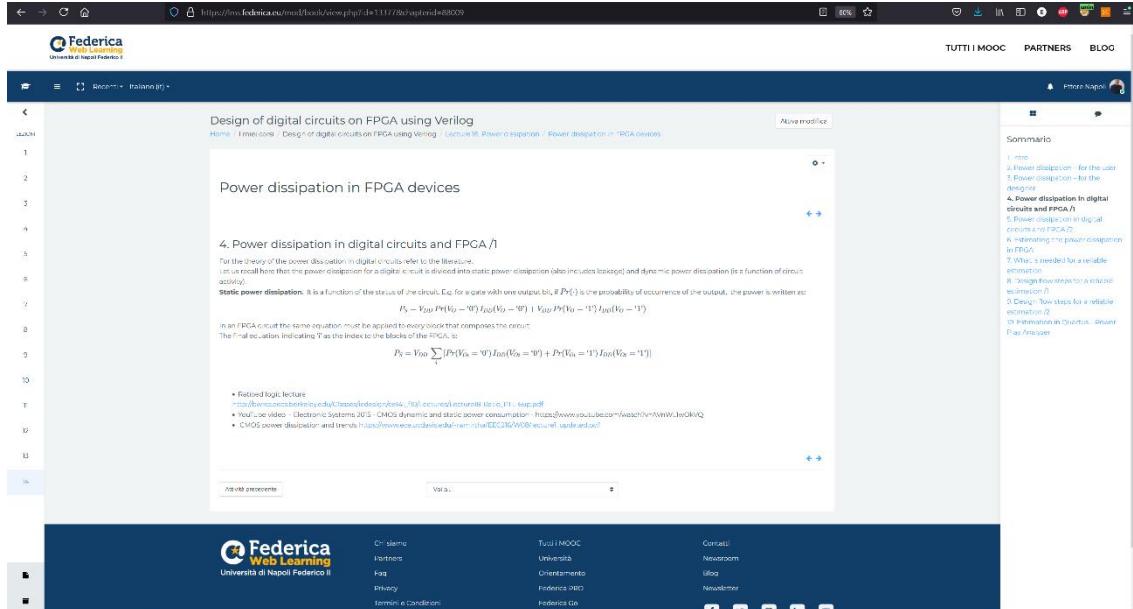


Fig. Introductory video to the HDL for sequential circuits lecture.

9) Finite State Machine. Definition and design techniques for synchronous Finite State Machines. State coding. HDL description for Mealy and Moore FSM. Fault tolerant FSM.

10) Power dissipation in programmable digital circuits. Power estimation for FPGA devices.



**Power dissipation in FPGA devices**

For the theory of the power dissipation in digital circuits refer to the literature. Let us recall here that the power dissipation for a digital circuit is divided into static power dissipation (also includes leakage) and dynamic power dissipation (is a function of circuit activity).

**Static power dissipation.** It is a function of the value of the circuit. E.g. for a gate with one output, b1, if  $P(V)$  is the probability of occurrence of the output, the power is written as:

$$P_s = V_{DD} P(V_b = 0) I_{DD}(V_b = 0) + V_{DD} P(V_b = 1) I_{DD}(V_b = 1)$$

In an FPGA circuit the same equation must be applied to every node that comprises the circuit. The  $\tau$ -th equation indicates  $\tau$  as the index to the blocks of the FPGA.

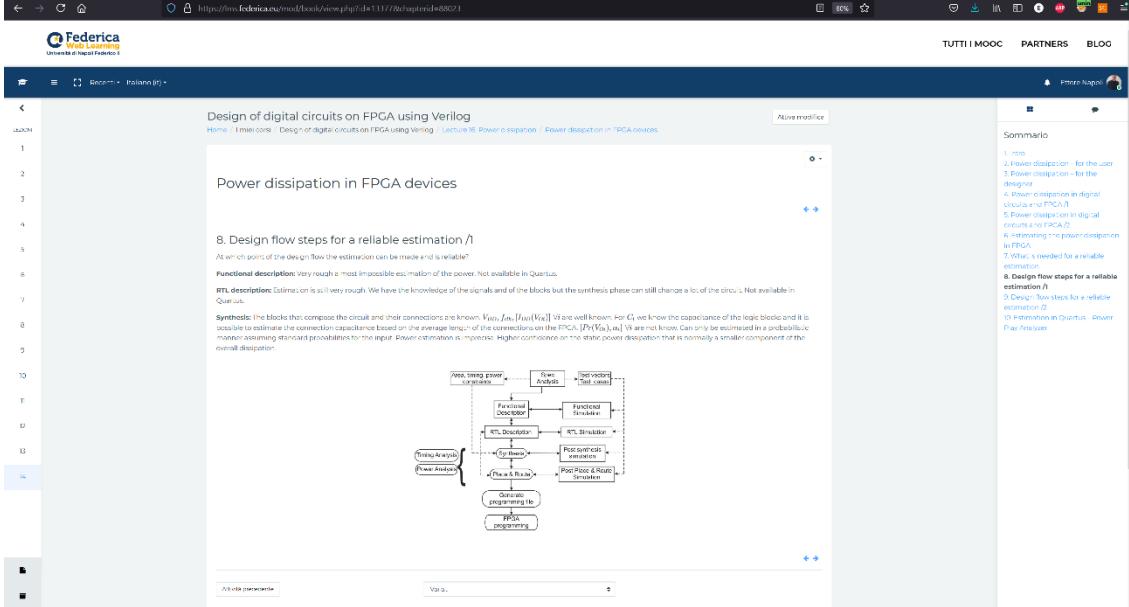
$$P_s = V_{DD} \sum_{\tau=1}^n [P(V_{b\tau} = 0) I_{DD}(V_{b\tau} = 0) + P(V_{b\tau} = 1) I_{DD}(V_{b\tau} = 1)]$$

• Related logic lecture:  
<https://drive.google.com/file/d/178lJcUvLwzHkTzXeW4t78qIzgpp.pdf>

• YouTube video - Electronic systems 2013 - CMOS dynamic and static power consumption - <https://www.youtube.com/watch?v=nWVWJrGKQIQ>

• CMOS power dissipation and trends <https://www.semiconductors-institute.ie/EEC2169/03%20lecture%20and%20lab/>

Fig. Slide from the power dissipation lecture.



The screenshot shows a Moodle-based course slide. The title is "Power dissipation in FPGA devices". The main content discusses the design flow steps for a reliable estimation of power dissipation. It includes a flowchart illustrating the process from "Power using power simulation" through various synthesis and analysis stages to "FPGA programming". A sidebar on the right contains a table of contents with 15 items related to power dissipation in digital circuits.

1.	Introduction
2.	Power dissipation - for the user
3.	Power dissipation - for the designer
4.	Power dissipation in digital circuits
5.	Power dissipation in digital circuits in FPGAs
6.	Power dissipation in digital circuits in FPGAs
7.	What's needed for a reliable estimation
8.	Design flow steps for a reliable estimation
9.	Design flow steps for a reliable estimation
10.	Design flow steps for a reliable estimation
11.	Information in Quartus - Power Estimation
12.	Information in Quartus - Power Estimation
13.	Information in Quartus - Power Estimation

Fig. Slide from the power dissipation lecture.

### 3 Results

The structure of the course and the treated topics are of great interest for many students. The fact that the course is intended for a bachelor's degree defines a much larger group of students that are interested. The main innovation of the created course is that it is in English while the original course is in Italian language. The modification allows the course to be offered, asynchronously, to all the Erasmus students as an English course.

The created online, asynchronous learning support will therefore be useful in various scenarios.

- 1) The students that are enrolled at UNINA for the Bachelor in Electronic Engineering. Around 90 per year. These students will benefit from the asynchronous learning having the lectures available when the actual lecturing is concluded. The different presentation format will also help the learning process.
- 2) Erasmus students. 5 per year yet shown interest for the topic and benefit from the fact that the online lectures are available also in the winter semester. This number is expected to increase in the next years.



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## UNINA COURSE #4

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# Design of digital circuits on FPGA using Verilog course FPGA oriented design module (3 ECTS)

### 1 Context of the course

The course is in the file of **Electronic Engineering**.

The EQF level of the course is **6 (Bachelor degree level)**.

The course is part of the Laurea degree in Electronic Engineering (bachelor) given at the University of Napoli Federico II (Italy). The entire course is 9ECTS and has been divided, for the purpose of the ErasmusX, into two modules: FPGA oriented design (3 ECTS) and Verilog HDL for synthesis (6 ECTS). This allows a larger number of Erasmus students to take advantage of the online course.

The **learning objectives** of the entire course, that is composed by the Verilog HDL for synthesis module and the FPGA oriented design module, are listed below.

Design of digital electronic systems based on programmable devices such as FPGA and CPLD. The course also provides the knowledge of the HDL Verilog language. The lectures detail: the design flow for FPGA and CPLD; timing for synchronous digital circuits; packages; classification, evolution and examples of commercial devices for Simple PLD, CPLD and FPGA devices; adders and arithmetic circuits implemented on FPGA and CPLD; Verilog hardware description languages for the design of combinational and sequential circuits. Verilog hardware description languages for the design of finite state machines and arithmetic circuits; I/O programmable circuitry for FPGA devices.

In the FPGA oriented design module, the addressed topics are listed below.

Design flow for digital circuits. Structure and technology for an FPGA device. The packages for digital circuits and the thermal management. Classification, evolution, and examples of commercial devices for Simple PLD, CPLD, and FPGA devices. The Quartus II software suite for FPGA design. Adder topologies for FPGA and CPLD devices. Power dissipation sources in FPGA devices. Tools and estimation techniques for FPGA power dissipation. I/O programmable circuitry for FPGA devices.

## 2 Implementation

The entire existing course, give in Italian and named “Sistemi elettronici programmabili” (that could be translated as “programmable electronic systems”) has been modified moving around the topics to allow the division into two modules. The lecture content has been renovated and translated in English.

After the re-organization, the course has been ported to the Federica.eu platform (<https://www.federica.eu/en/>). Federica is the proprietary Online Learning platform available at UNINA. Federica holds a large amount of MOOCs.

The Design of digital circuits on FPGA using Verilog is a nice addition to the list since the Federica platform lacks in course in English language and this has been also a good opportunity for the staff to familiarize with the new challenge. As an example, the course intro, written by the professor of the course, has been spoken by a professional English voice.

Also, the English setup of the ancillary course choices has been tested and corrected through the development of the course.

The porting required the creation of the slides decks to be ported into the Federica format and in twenty-six (30) short videos that are introductory to the lessons. The 30 videos are divided into fourteen (15) videos introducing the topics of the lecture and fourteen (15) videos summarizing with items the topics presented through the lecture.

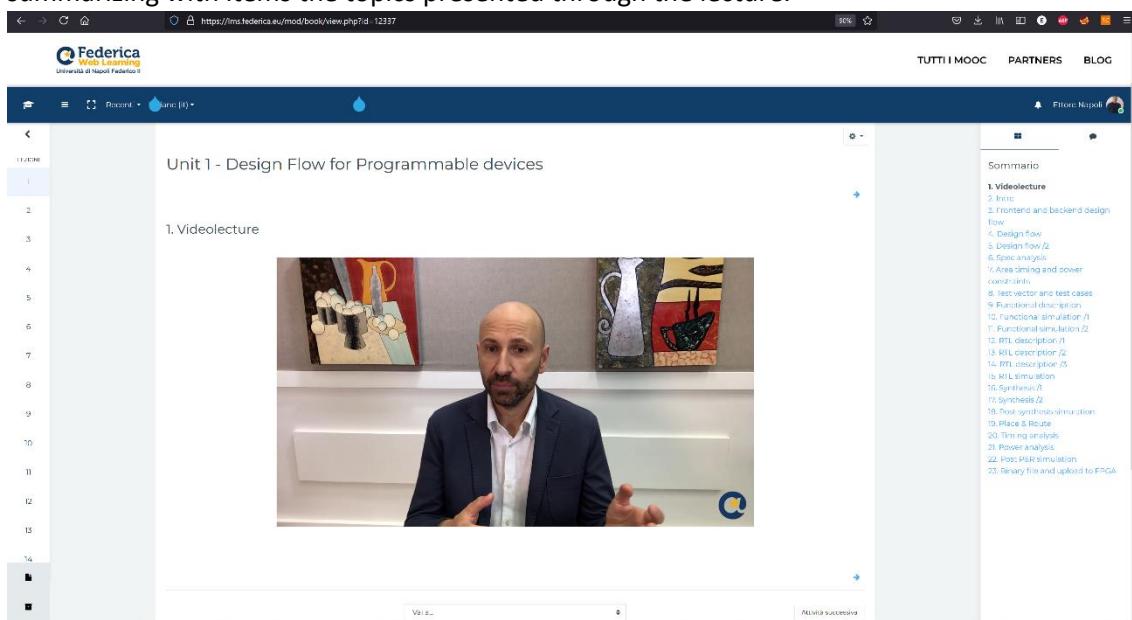


Fig. The video that introduces the first lecture. The design flow.

Also, an introductory text has been written by the professor, then filled with images and acted by a professional voice to be a presentation of the course. The text of the introductory video is the following:

*The newest processor in your cellphone allows better and better video quality to record the wonderful moments with your friends. The shining brand-new GPU has astonishing speed for your exciting hyper-realistic gaming.*

*Would you like to join a company that designs such high-performance digital circuits like Intel, Nvidia, or ARM?*

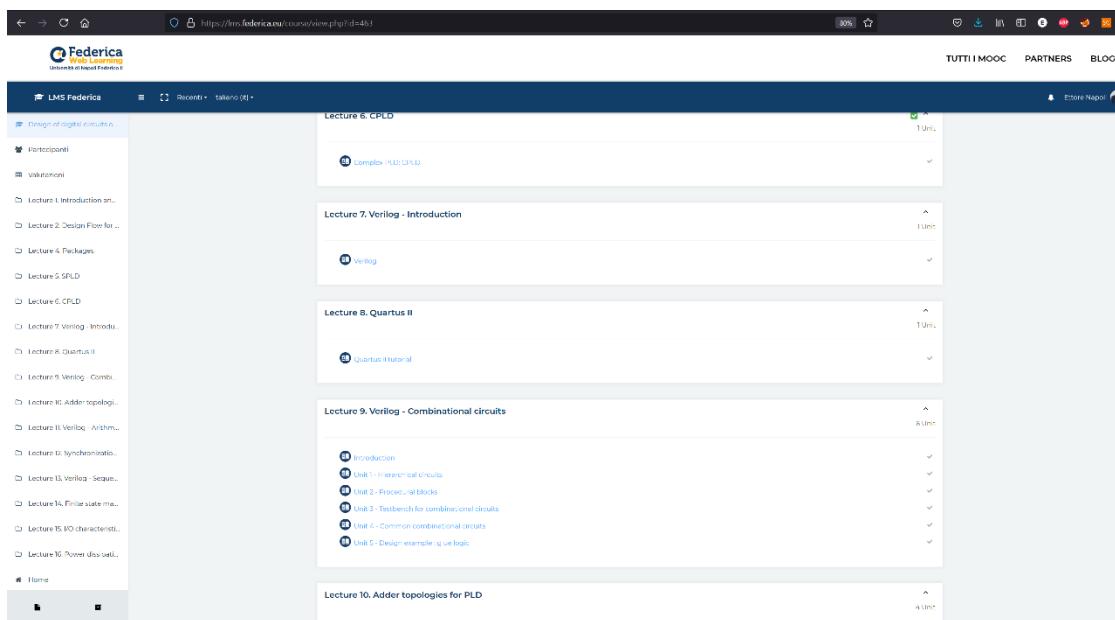
*Would you prefer to start your own company since you have a fantastic idea for a circuit that only needs your brain and an affordable technology to be born?*

*This course will guide you thorough the only successful way to design digital circuits, a skill that is needed for each one of those jobs. The course will also teach how to use an FPGA, a technology that is the only choice for new ideas to be benchmarked and for prototypes to be tested.*

*Finally, the course will teach the Verilog HDL, a standard de facto language for the design of digital circuits.*

*If these topics interest you, follow this course on Federica.eu*

## 2.1 A short summary of the lectures



The screenshot shows a list of 16 lectures for the 'Design of digital circuits on FPGA using Verilog' course. The lectures are organized into five main sections:

- Lecture 6: CPLD**: Contains 1 Unit, featuring 'Complex PLD/CLD'.
- Lecture 7: Verilog - Introduction**: Contains 1 Unit, featuring 'Verilog'.
- Lecture 8: Quartus II**: Contains 1 Unit, featuring 'Quartus Material'.
- Lecture 9: Verilog - Combinational circuits**: Contains 8 Units, including:
  - Introduction
  - Unit 1 - Sequential circuits
  - Unit 2 - Process, variables
  - Unit 3 - Testbenches for combinational circuits
  - Unit 4 - Common combinational circuits
  - Unit 5 - Design example: 16x16 logic
  - Unit 6 - Design example: 16x16 logic
  - Unit 7 - Design example: 16x16 logic
- Lecture 10: Adder topologies for PLD**: Contains 4 Units.

Fig. The list of lectures for the design of digital circuits on FPGA using Verilog course.

The ported course consists in 16 lectures, some of them shared between the two modules. The list of the topics for the FPGA oriented design module (3 ECTS), together with a brief outline of the content is given below.

- 1) Introduction. Digital Design, Implementation targets, FPGA

## 2) Digital design flow. Front end, back end, design example

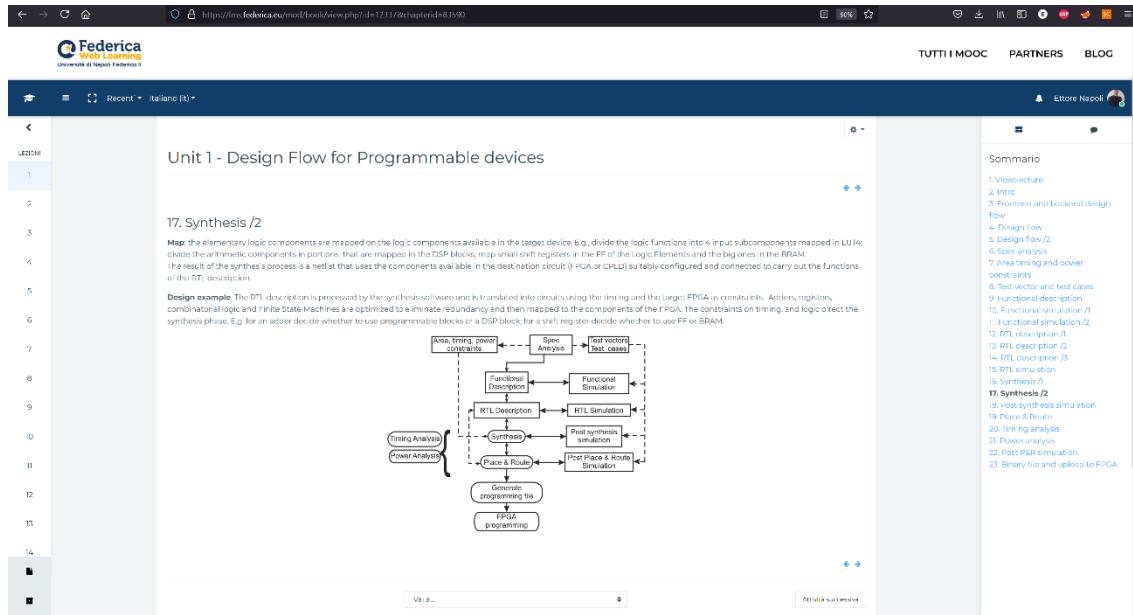


Fig. Slide of the design flow lecture.

## 3) FPGA structure.

Programmable logic cells, Technology (Programming techniques), Routing, Modern FPGA structures, BRAM, DSP, CPU, Distributed RAM, Shift registers, I/O circuitry, Package, power and speed

## 4) Packages. Classification and thermal design for digital circuits.

Fig. Lecture points from the introductory video to the lecture on the package.

## 5) SPLD. Simple Programmable Logic Device. Working principle and evolution.

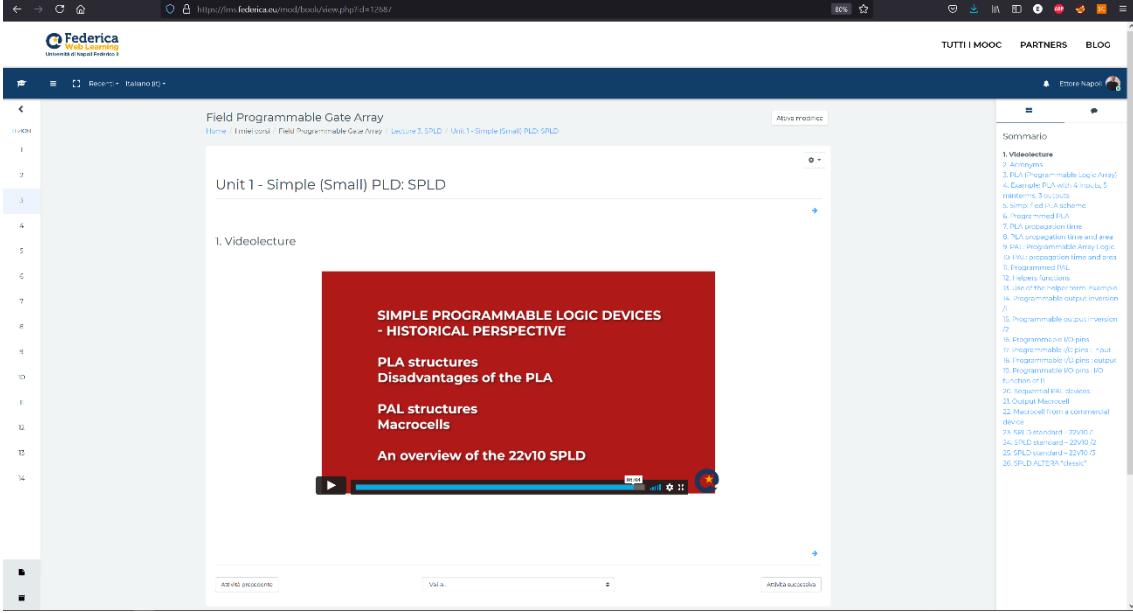


Fig. Lecture points from the introductory video to the Simple PLD.

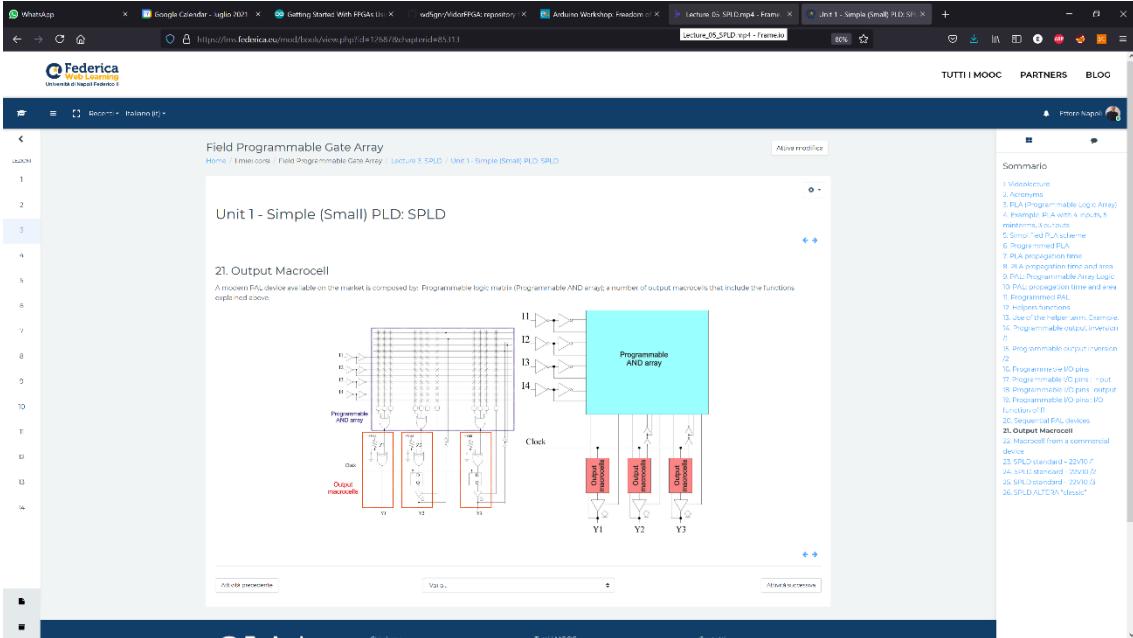


Fig. Slide from the Simple PLD lecture.

- 6) CPLD. Complex Programmable Logic Device. Working principle, evolution. Performance comparison with respect to the SPLD.



Fig. A frame of the introductory video to the Complex PLD devices.

Fig. Slide from the Complex PLD lecture.

## 7) Introduction to QuartusII

Fig. The point to point Quartus II tutorial.

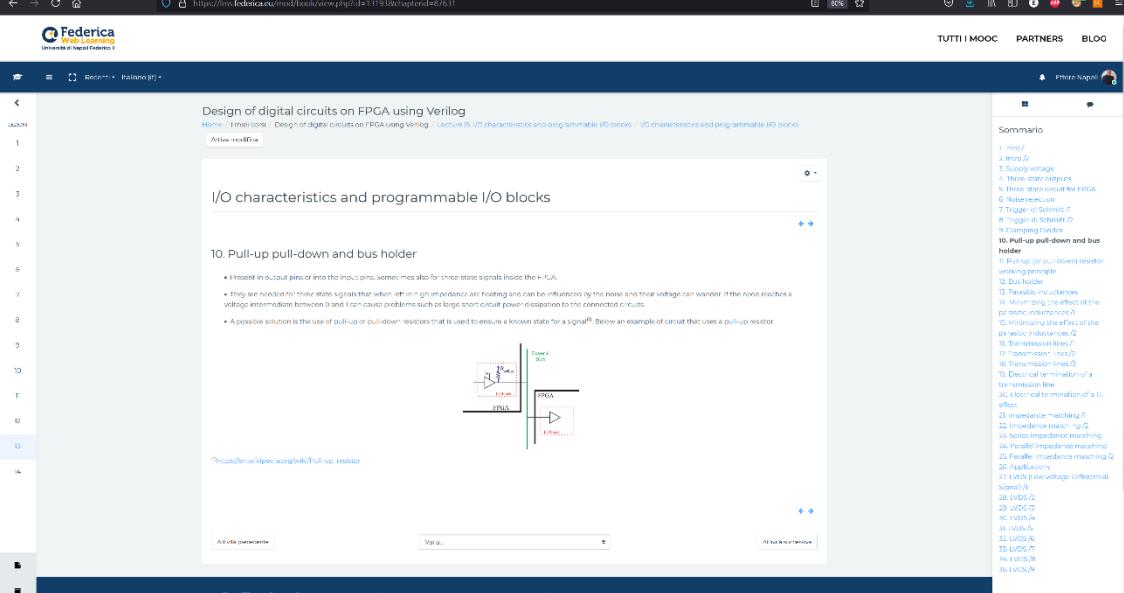
## 8) Adder topologies for FPGA and CPLD.

Fig. The lecture regarding the adder topologies is divided in three subsections.

Fig. A slide reporting adder performances for FPGA.

## 9) FPGA I/O circuits. (FPGA)

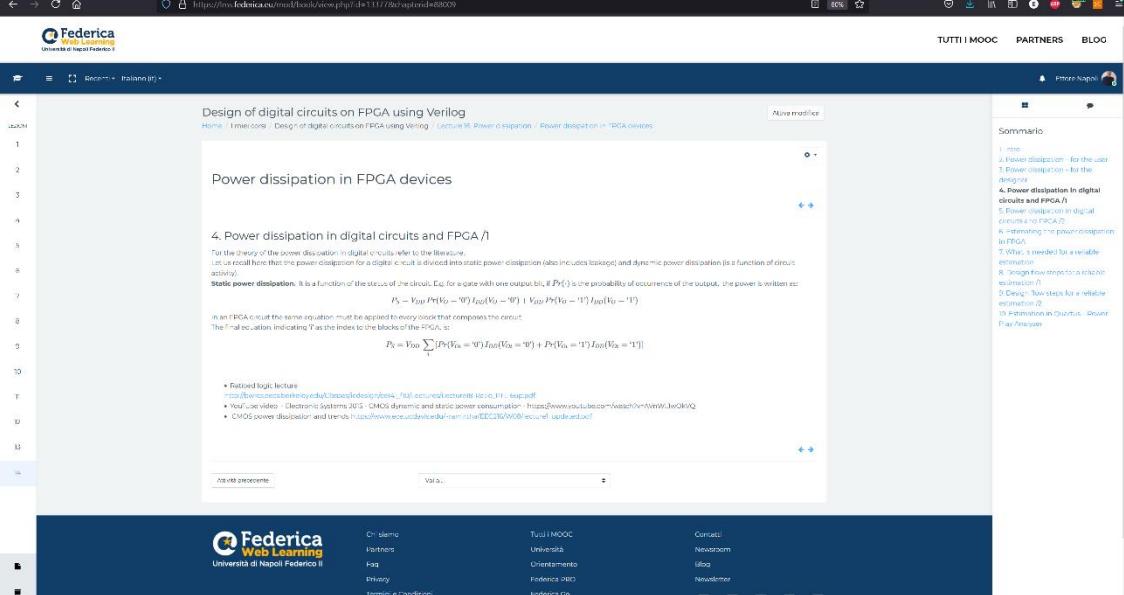
Fig. Slide from the programmable I/O blocks lecture.



The slide is titled "I/O characteristics and programmable I/O blocks". It contains a section titled "10. Pull-up pull-down and bus holder" which includes a note about floating pins and a diagram of a bus driver circuit with a pull-up resistor.

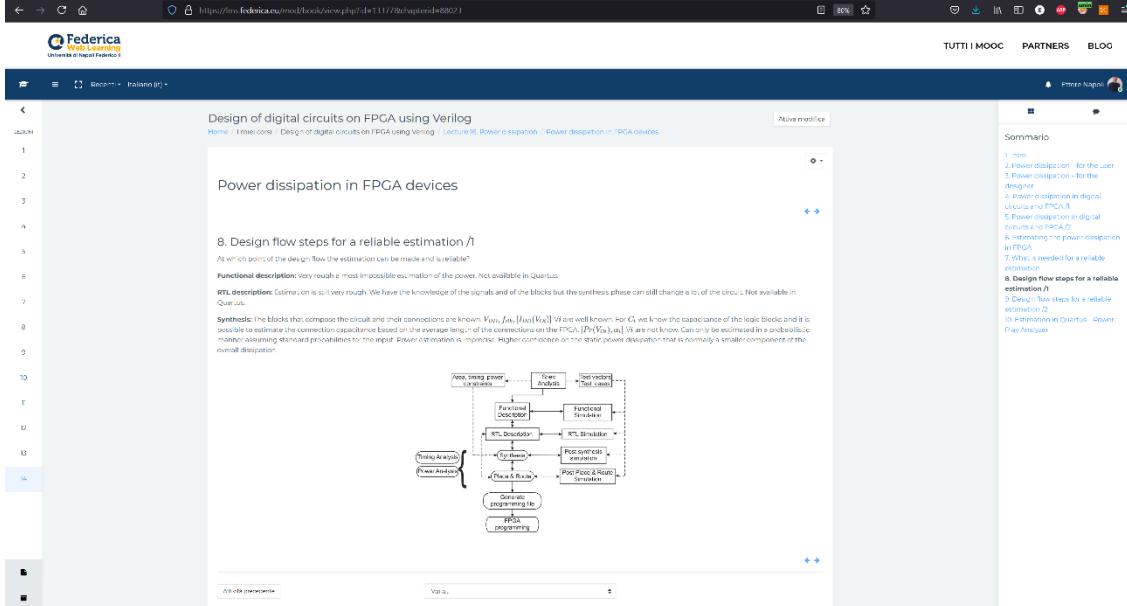
Fig. Slide from the programmable I/O blocks lecture.

## 10) Power dissipation in programmable digital circuits. Power estimation for FPGA devices.



The slide is titled "Power dissipation in FPGA devices". It contains a section titled "4. Power dissipation in digital circuits and FPGA /I" which discusses static power dissipation and provides a formula for calculating it based on output probabilities and current consumption.

Fig. Slide from the power dissipation lecture.



The screenshot shows a Moodle slide titled "Power dissipation in FPGA devices". The slide content includes a flowchart illustrating the design flow steps for power estimation. The flowchart starts with "Power dissipation in FPGA devices" and branches into two main paths: "Power estimation" and "Power analysis". The "Power estimation" path involves "Functional Decomposition", "RTL Description", and "Timing & Power Analysis". The "Power analysis" path involves "Post synthesis", "Post place & route", and "Post place & route Simulation". Both paths converge at "Final Power Estimation". A sidebar on the right lists "Sommaio" items related to power dissipation.

Fig. Slide from the power dissipation lecture.

### 3 Results

The structure of the course and the treated topics are of great interest for many students. The fact that the course is intended for a bachelor's degree defines a much larger group of students that are interested. The main innovation of the created course is that it is in English while the original course is in Italian language. The modification allows the course to be offered, asynchronously, to all the Erasmus students as an English course.

The created online, asynchronous learning support will therefore be useful in various scenarios.

- 3) The students that are enrolled at UNINA for the Bachelor in Electronic Engineering. Around 90 per year. These students will benefit from the asynchronous learning having the lectures available when the actual lecturing is concluded. The different presentation format will also help the learning process.
- 4) Erasmus students. 5 per year yet shown interest for the topic and benefit from the fact that the online lectures are available also in the winter semester. This number is expected to increase in the next years.



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## Annex 3. Summary of implemented courses

Lodz University of Technology (TUL)



In the framework of the ErasmusX project 10 online courses were developed in the areas of Management, Engineering and Computing as parts of the study programmes in the Lodz University of Technology (TUL) (table 1). They represent study courses ranging from 1 to 6 ECTS. They were selected out of 26 courses proposed by academic teachers in the open call for proposals carried out at TUL. In the selection process specific profiles of programme studies offered by the university and the in-depth analysis of courses usually selected by the Erasmus + incoming students were taken into account. Academic teachers, who proposed selected courses, received training support from E-Learning Centre of TUL (CEL) in order to get acquainted with the WIKAMP e-learning platform and tools which are used at the university. They were also acquainted with the guidelines on courses quality standards which were elaborated and agreed within the project consortium. They were offered advisory and technical support from CEL. Two experts on e-learning from TUL were responsible for proper realisation of the elaborated e-learning courses in order to ensure the quality and effectiveness. The final versions of the courses were presented and evaluated during the meeting of the group of authors, representatives of CEL and project coordinators at TUL.

The courses were offered in the framework of regular educational programmes to all students, including exchange students. They were promoted and offered especially for Erasmus+ incoming students in their mobility programmes for studies. The Covid-19 pandemic situation influenced the realization of the courses both negatively (as the mobility of students were limited/suspended and difficult to plan) and positively (as the offer of e-learning courses was attractive for mobility students in this situation).

Table 1. List of courses developed as online courses under the Erasmus X project – Lodz University of Technology

No	Title of the course	Study Programme	Teacher	Description of current content of the course
1	Innovation (3 ECTS)	Business and Technology	Sebastian Bakalarczyk, PhD	<a href="https://programy.p.lodz.pl/ectslabel-web/przedmiot_1.jsp?l=en&amp;idPrzedmiotu=150447&amp;pklId=118&amp;s=7&amp;j=0&amp;w=Management%20and%20Production%20Engineering&amp;v=1">https://programy.p.lodz.pl/ectslabel-web/przedmiot_1.jsp?l=en&amp;idPrzedmiotu=150447&amp;pklId=118&amp;s=7&amp;j=0&amp;w=Management%20and%20Production%20Engineering&amp;v=1</a>
2	E-marketing (2 ECTS)	Management	Siuda Dagna, PhD, Eng.	<a href="https://programy.p.lodz.pl/ectslabel-web/przedmiot_1.jsp?l=en&amp;idPrzedmiotu=158253&amp;pklId=116&amp;s=4&amp;t=1&amp;j=0&amp;w=Management">https://programy.p.lodz.pl/ectslabel-web/przedmiot_1.jsp?l=en&amp;idPrzedmiotu=158253&amp;pklId=116&amp;s=4&amp;t=1&amp;j=0&amp;w=Management</a>
3	Brand Management (5 ECTS)	Management	Magdalena Grębosz-Krawczyk, PhD, Prof. of TUL	<a href="https://programy.p.lodz.pl/ectslabel-web/przedmiot_1.jsp?l=en&amp;idPrzedmiotu=158228&amp;pklId=116&amp;s=4&amp;j=0&amp;w=Management&amp;v=1">https://programy.p.lodz.pl/ectslabel-web/przedmiot_1.jsp?l=en&amp;idPrzedmiotu=158228&amp;pklId=116&amp;s=4&amp;j=0&amp;w=Management&amp;v=1</a>
4	Computer Aided Design (3 ECTS)	Business and Technology	Damian Obidowski, PhD, Eng. Jan Grudziecki PhD, Eng.	<a href="https://programy.p.lodz.pl/ectslabel-web/przedmiot_3.jsp?l=en&amp;idPrzedmiotu=169010&amp;pklId=1188&amp;s=2&amp;j=0&amp;w=Management%20and%20Production%20Engineering&amp;v=3">https://programy.p.lodz.pl/ectslabel-web/przedmiot_3.jsp?l=en&amp;idPrzedmiotu=169010&amp;pklId=1188&amp;s=2&amp;j=0&amp;w=Management%20and%20Production%20Engineering&amp;v=3</a>
5	Matlab & Simulink (6 ECTS)	Mechanical Engineering	Grzegorz Liśkiewicz, PhD, Eng	Programme not available in English now
6	Elements of Microwave Technique (2 ECTS)	Electronic and Telecommunication Engineering – Applied Electronics	Łukasz Januszkiwicz PhD, Eng, Prof of TUL	<a href="https://programy.p.lodz.pl/ectslabel-web/przedmiot_3.jsp?l=en&amp;idPrzedmiotu=171635&amp;pklId=1154&amp;s=1&amp;t=1&amp;j=0&amp;w=Electronics%20and%20Telecommunications">https://programy.p.lodz.pl/ectslabel-web/przedmiot_3.jsp?l=en&amp;idPrzedmiotu=171635&amp;pklId=1154&amp;s=1&amp;t=1&amp;j=0&amp;w=Electronics%20and%20Telecommunications</a>
7	Electromagnetic Compatibility (4 ECTS)	Electronic and Telecommunication Engineering – Applied Electronics	Łukasz Januszkiwicz PhD, Eng, Prof. of TUL	<a href="https://programy.p.lodz.pl/ectslabel-web/przedmiot_3.jsp?l=en&amp;idPrzedmiotu=170085&amp;pklId=1271&amp;s=1&amp;j=0&amp;w=Electronic%20and%20Telecommunication%20Engineering&amp;v=3">https://programy.p.lodz.pl/ectslabel-web/przedmiot_3.jsp?l=en&amp;idPrzedmiotu=170085&amp;pklId=1271&amp;s=1&amp;j=0&amp;w=Electronic%20and%20Telecommunication%20Engineering&amp;v=3</a>
8	CAD tools for Electronics and Microelectronics (3 ECTS)	Electronic and Telecommunication Engineering	Jacek Podgórski PhD, Eng.	<a href="https://programy.p.lodz.pl/ectslabel-web/przedmiot_1.jsp?l=en&amp;idPrzedmiotu=158832&amp;pklId=132&amp;s=2&amp;t=1&amp;j=0&amp;w=Electronics%20and%20Telecommunications">https://programy.p.lodz.pl/ectslabel-web/przedmiot_1.jsp?l=en&amp;idPrzedmiotu=158832&amp;pklId=132&amp;s=2&amp;t=1&amp;j=0&amp;w=Electronics%20and%20Telecommunications</a>
9	XML Technologies (2 ECTS)	Information Technologies	Joanna Ochelska-Mierzejewska, Phd, Eng, Wiktor Wandachowicz, Eng	<a href="https://programy.p.lodz.pl/ectslabel-web/przedmiot_3.jsp?l=en&amp;idPrzedmiotu=165808&amp;pklId=1233&amp;s=3&amp;j=0&amp;w=Information%20Technology&amp;v=3">https://programy.p.lodz.pl/ectslabel-web/przedmiot_3.jsp?l=en&amp;idPrzedmiotu=165808&amp;pklId=1233&amp;s=3&amp;j=0&amp;w=Information%20Technology&amp;v=3</a>
10	Professional Language Skills (1 ECTS)	Different courses at International Faculty of Engineering	John Speller PhD	<a href="https://programy.p.lodz.pl/ectslabel-web/przedmiot_3.jsp?l=en&amp;idPrzedmiotu=166150&amp;pklId=1189&amp;s=2&amp;j=0&amp;w=Management%20and%20Production%20Engineering&amp;v=3">https://programy.p.lodz.pl/ectslabel-web/przedmiot_3.jsp?l=en&amp;idPrzedmiotu=166150&amp;pklId=1189&amp;s=2&amp;j=0&amp;w=Management%20and%20Production%20Engineering&amp;v=3</a>

## 1 Realization of online courses under the ErasmusX project

Almost all online courses prepared in the framework of the ErasmusX project were chosen by the exchange foreign students in the academic year 2020/2021. The total number of exchange students who attended the **courses was 66** (table 2).

**Table 2. Exchange students attendance in ErasmusX online courses**

No	Title of the course	Number/Home university
1	Innovation (3 ECTS)	10 students - Southern Federal University, Russia.
2	E-marketing (2 ECTS)	-
3	Brand Management (5 ECTS)	10 students - Southern Federal University, Russia
4	Computer Aided Design (3 ECTS)	2 students - Universidad Pública de Navarra, Spain 5 students - Universita degli Studi di Cagliari, Italy
5	Matlab & Simulink (6 ECTS)	5 students - Universita degli Studi di Cagliari, Italy 2 students - Universidad de Leon, Spain 1 students - Aristotle University of Thessaloniki, Greece
6	Elements of Microwave Technique (2 ECTS)	1 student - Universidade de Vigo, Spain
7	Electromagnetic Compatibility (4 ECTS)	4 students - Universita Degli Studi di Napoli Federico II, Italy 3 students - Universidad Politecnica de Madrid, Spain 1 students - Suleyman Demirel University, Turkey
8	CAD tools for Electronics and Microelectronics (3 ECTS)	4 students - Universita Degli Studi di Napoli Federico II, Italy 1 student - Universidad Politecnica de Madrid, Spain 1 student - Istanbul University Cerrahpasa, Turkey
9	XML Technologies (2 ECTS)	2 students - Universidad Politecnica de Madrid, Spain 1 student - Universidad European Madrid, Spain
10	Professional Language Skills (1 ECTS)	3 students - ECAM Lyon, France 2 students - ECAM Strasbourg, France 2 students - Excelia Group, France 5 students - Instituto Politecnico do Porto (ISEP), Portugal 1 student - Audencia Nantes School of Management, France

The description summary of the realization of the courses for 4 selected online courses is available in the annexes.



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# TUL COURSE #1

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## E-learning of technical courses in the framework of Erasmus-X project.

Łukasz Januszkiewicz

### 1. Introduction

Below, a short description of teaching activities is presented that were taken under the framework of Erasmus-X project in Lodz University of Technology. This covers two subjects that are technical courses on Master of Engineering program. Both subjects address theoretical part as well as practical skills.

While E-learning process could be less motivating for students to take active part in lectures, in this case interactive lectures were proposed. These are recorded lectures with quiz-like questions. The positive answer to the question is necessary for lecture to continue.

Teaching technical subject is challenging with E-learning because students have no access to the laboratory equipment. To overcome this limitation, computer simulations were intensively utilized in these courses. It gives the skills of using specialized software that is standard procedure in the industrial design process. It is a piece of “learning by doing” methodology that activates students to perform numerical experiments and critically assess their results.

Using free software that could be accessible to every student working from home was another challenge. For these classes a electronic circuit simulator QUCS was used. It can be used for both time domain and frequency domain simulations. It gives the access to numerical models of discrete elements and also transmission lines. Sonnet Software was utilized for electromagnetic simulations of microwave elements (Elements of Microwave Technique) and electromagnetic coupling (Electromagnetic compatibility).

### 2. Elements of Microwave Technique

This course is offered to the students of second-cycle program of Electronics and Telecommunications (Master level). It is addressed to students who acquired the basic knowledge on electronic circuits and electronic elements. ECTS credit points: 2 ECTS

The aim of this subject is to present the principles of microwave technique. It focuses on explaining the basic phenomena that are necessary to understand the differences between low frequency electronics and microwave technique. A lot of attention is given to impedance matching and transmission lines because those issues are important even for those engineers who rather use high-frequency devices rather than design their own constructions. The passive microstrip elements such as transmission lines and couplers are presented in the form of practical exercises to show the way they could be designed. Altogether it is a short introduction to the fascinating world of microwaves.

The contents of the subject covers:

- Basic definitions
- Fields of applications
- Principles of electromagnetics
- Computational Electromagnetics in microwave technique
- Microwave transmission lines
- Impedance matching and impedance transformers
- Scattering matrix
- Passive components
- Microwave antennas
- Active elements
- Microwave measurement technique

The course consists of two complementary parts: videos with interactive lecture (theory) and the set of exercises for self-realization (practice). In fig. 1 the screen of on-line lecture is presented where the interactive quiz is visible. This tool was used to allow self-assessment and identify the need of repeating the particular piece of material.

The screenshot shows a presentation slide from the "Technical University Institute of Electrotechnics" about "Electromagnetic waves". The slide features a diagram of a wave on Earth's surface with arrows indicating its propagation. A callout box contains a control question: "Which statement is right?". It lists two options: "Very short electromagnetic waves perform in the different way than longer waves." and "No matter the wavelength, electronic circuits are described only by Kirhoff equations, not the wave equations." A progress bar at the top right indicates "Postęp: 0/1". To the right of the slide is a sidebar with a navigation menu:

- > Strony
- > Moje przedmioty
- > Zapisy na kursy językowe
- > Budowanie doskonałości PL
- > EMC
- > Microwaves
- > Uczestnicy
- Odznaki
- Kompetencje
- Oceny
- > Elements of Microwave Technique
- > Theory, part 1
  - First lecture - introduction
  - > Theory, part 2
  - > Theory, part 3
  - > Theory, part 4
  - > Theory, part 5
  - > Theory, part 6
  - > Theory, part 7
  - > Theory, part 8
  - > Theory, part 9

Fig.1. The interactive lecture on Elements of Microwave Technique: the control question appears in the summary of each lecture.

The practical part consists of 5 exercises, fig. 2 shows the example of one instruction. The exercises were designed in such a way that the students could carry them out on their own at home with the use of free simulation software. The instructions for the exercises include a very short theoretical introduction, followed by step-by-step instructions on how to develop a basic model of a microwave element in the program. The essential part of the exercise is a set of simulation experiments for individual implementation.

## Instructions for practical exercise nr 3

### 1. The purpose and scope of the exercise

The aim of this exercise is to present the basic properties of microstrip transmission line and the features of Sonnet simulating software.

During the exercise you will use Sonnet Lite software that you can download from <https://www.sonnetsoftware.com/products/lite/download.html>. This is a free version of Sonnet software. It uses a modified method of moments analysis based on Maxwell's equations to perform a true three dimensional current analysis of predominantly planar structures. After downloading and installing the software please [register this for free](#) to have better simulation capabilities.

The simplified geometry of microstrip transmission line is presented in fig. 1. This consists of thin metallic strip of width  $w$  that is placed on dielectric substrate (PCB material) of the height  $h$ . Beneath the dielectric, there is a metallic ground plane surface that is connected to the ground potential.

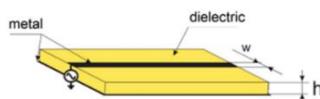


Fig. 1. The geometry of single signal trace model in Sonnet

### 2. Building the model of microstrip line on FR4 substrate in Sonnet software.

To create the model of microstrip line in Sonnet software, open the program and from the Sonnet task bar select > Project > New Geometry



## Nawigacja

- Start
- Kokpit
- Strony
- Moje przedmioty
  - Zapisy na kursy językowe
  - Budowanie doskonałości PŁ
  - EMC
  - Microwaves
    - Uczestnicy
    - Odznaki
    - Kompetencje
    - Oceny
      - Elements of Microwave Technique
      - Theory, part 1
      - Theory, part 2
      - Theory, part 3
      - Theory, part 4
      - Theory, part 5
      - Theory, part 6
      - Theory, part 7
      - Theory, part 8

Fig.2. The practical exercise with free software for microwave structure simulation (Sonnet)

Assessment of the course is on the basis of an on-line test and the evaluation of students reports on practical part. The set of questions in the test address the theoretical part of the material.

This subject was conducted in winter semester 2020/21 and 2021/2022. The participants were attending to regular course in Lodz University of Technology as well as Erasmus exchange program. Students expressed positive opinions on the subject, so there was no problem with the number of people willing to participate in the second edition of the course.

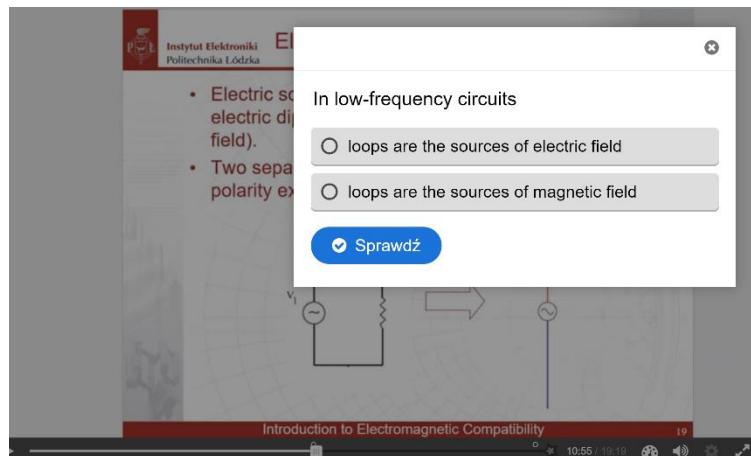
### 3. Electromagnetic Compatibility

This course is offered to the students of second-cycle program of Electronics and Telecommunications (Master level) as well as for students of Electrical Engineering. It is addressed to students who acquired the basic knowledge on physics, electric circuits and electronics. ECTS credit points: 4 ECTS.

The aim of this subject is to present the principles of Electromagnetic Compatibility. It focuses on explaining the basic phenomena that are necessary to understand the mechanism of generation of electromagnetic disturbances and the transfer of noise from one circuit to another. A lot of attention is given to noise coupling and crosstalk analysis as those issues are important to printed circuit board designers. Also the grounding and shielding of circuits is covered here. Theoretical part is illustrated with practical exercises. They have the form of virtual experiment performed with simulation software. This course will help in designing devices that can be safely introduced to the market.

The course consists of two complementary parts: videos with interactive lecture (theory) and the set of exercises for self-realization (practice). In fig. 3 the screen of on-line lecture is presented where the interactive quiz is visible.

The practical part consists of 5 exercise, fig. 4 shows the example of one instruction. The essential part of the exercise is a set of simulation experiments for individual implementation. In this subject the following software was used: QUCS, Sonnet, FEMM.



*Fig.3. The interactive lecture on EMC: the control question that check if the student needs to repeat this part of lecture*

*Fig.4. The practical exercise with free software for circuit simulation*



Assessment of the course is on the basis of two elements: a on-line test and the report on practical exercises.

Contents:

- The principle of EMC
- Basic definitions
- Signals in time and frequency domains
- Noise coupling
- Grounding
- Electromagnetic shielding
- ESD - electrostatic discharge protection
- Design practice for EMC
- EMC measurement technique

Students expressed positive opinions about the subject. They appreciated in particular the on-line demonstrations of measurement procedures.

#### **4. E-learning challenges**

The following pedagogical challenges were identified during e-learning process:

- difficulties of students with maintaining attention during e-lectures,
- difficulties with time management,
- different levels of motivation among participants of the classes.

In next edition of the courses the peer-assessment will be used to increase the motivation of the students. It will also promote critical thinking that is an important ability of engineers.

## TUL COURSE #2

Magdalena Grębosz-Krawczyk  
Lodz University of Technology

### **REPORT COURSE „BRAND MANAGEMENT”**

The course “Brand Management” presents theoretical knowledge and supports the development of practical skills in the field of brand management, with particular emphasis on building the brand identity, brand positioning and planning activities in the area of marketing communication.

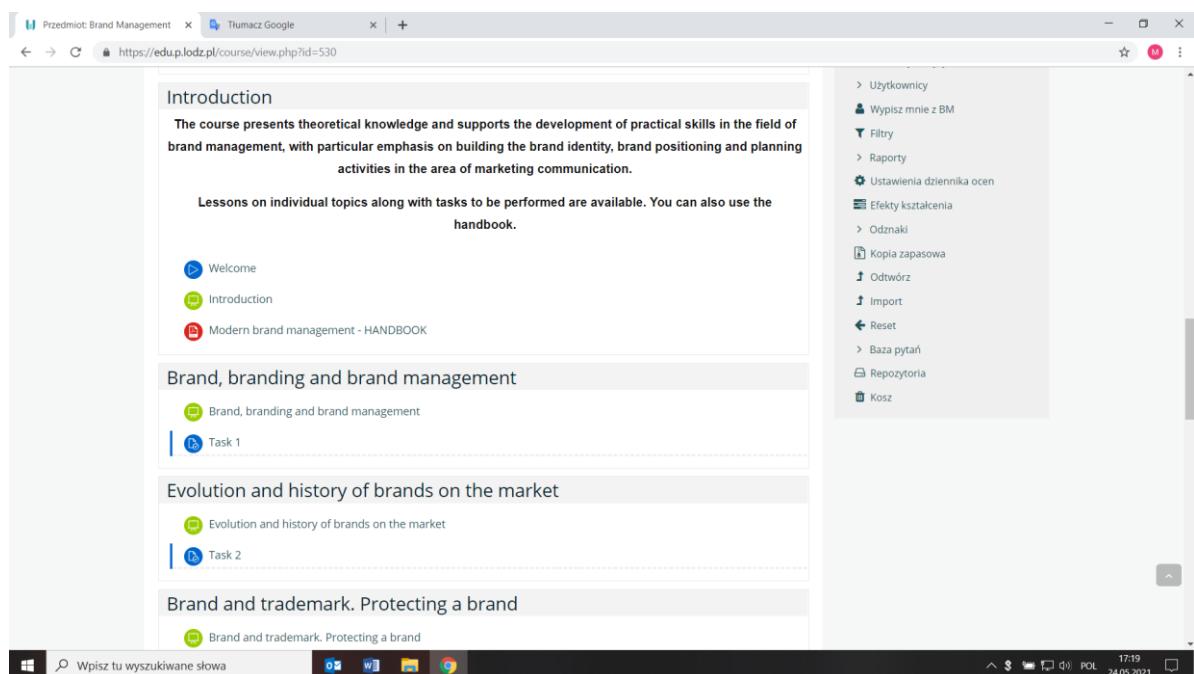
The course is dedicating for students of bachelor level and contain the following sections:

1. Introduction
2. Brand, branding and brand management.
3. Evolution and history of brands on the market.
4. Brand and trademark. Protecting a brand.
5. Brand elements.
6. Functions of brands.
7. Brand identity and image.
8. Brand equity and financial value.
9. Brand positioning.
10. Brands strategies.
11. Brand communications.
12. Brand strategies on international market.
13. New trends in brand management.
14. Final evaluation.

**Lessons on individual topics along with tasks to be performed are available for students. Apart from the form of lessons and tasks students can find also some**

videos, links and readings. They can also use the handbook (Fig. 1). After the classes students are able to:

1. explain the basic concepts of brand management
2. design different brand elements
3. give examples of different brands strategies
4. create the plan of the brand promotion
5. discuss about new trends in brand management.



The screenshot shows a Windows desktop environment with a browser window open to a course page. The browser tabs are 'Przedmiot: Brand Management' and 'Tłumacz Google'. The URL is https://edu.p.lodz.pl/course/view.php?id=530. The page content is organized into sections: 'Introduction', 'Brand, branding and brand management', 'Evolution and history of brands on the market', and 'Brand and trademark. Protecting a brand'. Each section contains a brief description and a 'Task' button. A sidebar on the right lists various administrative functions like 'Uzytkownicy', 'Wypisz mnie z BM', 'Filtry', 'Raporty', etc. The taskbar at the bottom shows icons for File Explorer, Word, Excel, and Google Chrome. The system tray indicates it's 17:19 on 24.05.2021.

Fig. 1. Screenshot from online platform with presentation of the first lessons content

Evaluation of these classes is based on realisation of the task "Final Evaluation" (50% of the final mark) and realisation of 8 practical tasks (50% of the final mark). The tasks are evaluated by course lecturer.

In the 2020/21 summer semester, the course was carried out for 10 students.



## TUL COURSE #3

### Innovation Course

#### General information

**ECTS credit points:** 4 ECTS

**Level of study:** Bachelor level

#### Course learning outcomes and Aim of the course:

After completing the course Student should: list and classify types of innovation, analyse the processes associated with the management of innovation, search, and identify sources of innovative improvements, prepare proposals for improvements in the innovation activities, and use of methodologies to support innovation design.

#### Programme learning outcomes:

Student defines the nature and role of modern management concepts and indicates the appropriate methods and techniques; uses appropriate principles, methods, techniques and tools to solve management problems and determines their suitability; communicates in a foreign language, taking into account the specialist language at the B2 level, and observes new solutions in the field of management, law and technological progress, sees and resolves management and engineering dilemmas.

Group:

40 Students (30 regular TUL Students and 10 Students – virtual mobility from Southern Federal University (Rostov on Don, Russian Federation)).

#### Course lecturer

**Sebastian Bakalarczyk, PhD, DHC**

**Faculty:** Management and Production Engineering  
**Departament of Management Systems and Innovation**

#### Assessment rules

Short tests after each part and final essay.

Screenshot from online platform with the content of the course:



My courses > Innovation > Part II (up to 30 points) > 4 innovation development > Preview

## 4 Innovation development

Preview Edit Reports Grade entry

The objectives of process models

**Objectives**

Target group: Research, Students, Practitioners, Companies

**Descriptive models**: Description and evaluation of actual practice

**Normative models**: Recommendation of an ideal process

**Management tools**: Visualization and systematization of development activities in companies

**Didactic models**: Visualization and simplification of development activities

**Checkmarks** indicate which models meet the target group requirements.

**Navigation**

- Home
- Dashboard
- Site pages
- My courses
  - Zespoły na kursy (czynione)
  - Budżetowe dokonania (0 PLN)
  - CWIM - seminarium 2019
  - CWIM - seminarium 2019 - grupa 1
  - IDEA BOX
  - Innovation
    - Participants
    - Badges
    - Competencies
    - Grades
    - Innovation
    - Course intro
    - Part I (up to 30 points)
      - Innovation development
        - Innovation inputs
        - Innovation management tools
        - Final essay (up to 40 points)
      - Preventive plan
      - Kongrebus
      - Kurs C1 (jak rapportować progi na WIKAMP1 (2019-10-21))
      - Kurs C2 (Wykłady na platformie)

PREVIOUS ACTIVITY: Assessment of company innovation potential | NEXT ACTIVITY: 5 innovation impulses

https://erudit.educat.net/mod/lesson/view.php?id=132758&from=review-1

## 6 Innovation management tools

Preview Edit Reports Grade entry

Types of tools

**GENERAL INNOVATION TOOLS**

- Benchmarking
- Brainstorming
- Business Process Reengineering
- Change Management
- Technology Audit
- Technology Forecast
- Value Analyses

**PRODUCT INNOVATION TOOLS**

- Design for X
- Quality Function Deployment

**MANAGERIAL INNOVATION TOOLS**

- Failure Mode and Effect Analysis
- Peer Evaluation
- Team Building
- ISO 9000
- Total Productive Maintenance

**PROCESS INNOVATION TOOLS**

- Design for Manufacture and Assembly
- Lean Thinking
- Continuous Improvement
- Concurrent Engineering
- Just In Time

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    - Part I (up to 30 points)
      - Innovation development
        - Innovation inputs
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      - Kongrebus
      - Kurs C1 (jak rapportować progi na WIKAMP1 (2019-10-21))
      - Kurs C2 (Wykłady na platformie)

https://erudit.educat.net/mod/assignment/view.php?id=18951&from=review-1

WIKAMP

Home My courses Check e-mail WebDrukarnia WIKAMP Platforma virtUEL

My courses > Innovation > Final Essay (up to 40 points) > Final Essay

## Final Essay

Please write 5-6 pages with references and sources about one from following topics:  
1. Innovation and Innovativeness - differences and similarities;  
2. Managing innovation as a process;  
3. Managing innovative organizations.

**Grading summary**

Hidden from students	No
Participants	40
Submitted	39
Needs grading	10
Due date	Tuesday, 13 April 2021, 11:59 PM
Time remaining	Assignment is due

**Navigation**

- Home
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        - Innovation management tools
        - Final essay (up to 40 points)
      - Preventive plan
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      - Kurs C2 (Wykłady na platformie)



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## Annex 4. Summary of implemented courses

University of Latvia (UL)



## UL COURSE #1

# Economics of tourism

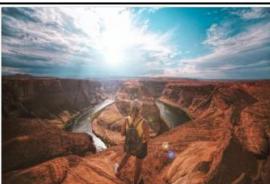
### 1 Context of the course

Course summary: The aim of the course “Economics of tourism” is to develop students' understanding of tourism as a complex system, the functioning of its elements and interaction with the external environment, the role of tourism in the national economy. As a result of the course students acquire the ability to orient themselves in the activities of different tourism sectors, understand the specifics of tourism demand and supply, the importance of the tourist destination in attracting tourists, know and appreciate tourism development trends, understand the interaction aspects of the tourism system and its external environment, acquire, analyze and evaluate tourism statistics.

Number of ECTS credits: 3 ECTS

Area/field: Economics

Level: Bachelor



**Economics of tourism**

3.0 ECTS

Fall semester 2020/2021

Faculty of Business, Management and Economics

University of Latvia

 **Business & Economics**

### 2 Implementation

- Asynchronous part of the online course “Economics of tourism” included video lecture recordings, reading materials, quizzes, tests, voting.

- Synchronous part of the course “Economics of tourism” - participation in online Workshop (title for 2020/2021 academic year workshop “Tourism industry regulation and support during pandemic”)
- As the result evaluation online course “Economics of tourism” included Online midterm exam as well as Online exam.

### 3 Results

When the course “Economics of tourism” was promoted to Erasmus+ students , expectation was to have at least 10 students. In the fall semester of 2020/2021 online course “Economics of tourism” was chosen by 11 Erasmus+ mobility students from France, Taiwan, Georgia, Spain, Germany, Austria, and Russia. All 11 students continued to study the course and received positive grades.

Anonymous Erasmus+ mobility student course quality evaluation organized by University of Latvia indicated that students evaluated on average “Economics of tourism” course in 7 point scale system as 6,3, which is above average evaluation in the field. About the content of the study course average evaluation was 6.4 from 7 points. For teaching the study course evaluation was 6.39 from 7 points.

Evaluation more in details:

- 6.3 points The content of the study course corresponded to the description of the course
- 6.7 points The content of the study course did not duplicate another course
- 6.3 points The suggested literature and materials were easily accessible and useful
- 6.3 points The materials available in the e-course helped in the acquisition of the study course, if the course did not have an e-course, the answer option “I don't know, I can't say” should be noted.
- 6.3 points During the semester, the examinations facilitated the acquisition of the study course
- 6.3 points The lecturer presents the course topics in an understandable way
- 6.0 points The teaching methods used by the teaching staff facilitated the acquisition of the study course
- 6.7 points The lecturer was available for consultations
- 6.7 points During the study course I achieved the study results recorded in the study course description
- 6.3 points I would like to take another course with this teacher
- 6.3 points Explanations of the teaching staff about the results of the tests are sufficient



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**VadZ3019-EN :  
Economics of Tourism**

Kristīne Bērziņa  
email [kristine.berzina@lu.lv](mailto:kristine.berzina@lu.lv)  
consultations in MsTeams Tuesdays 16.00-17.00,  
compulsory to apply for consultation in advance  
<https://ej.uz/konsultac>

  
Co-funded by the  
Erasmus+ Programme  
of the European Union

**VadZ3019-EN :  
Economics of Tourism**

Kristīne Bērziņa  
email [kristine.berzina@lu.lv](mailto:kristine.berzina@lu.lv)  
consultations in MsTeams Tuesdays 16.00-17.00,  
compulsory to apply for consultation in advance  
<https://ej.uz/konsultac>

  
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Erasmus+ Programme  
of the European Union

00:15 / 35:00

Details

Meeting in "General"

Published on 11/9/2020 by Kristīne Bērziņa

**VadZ3019-EN :  
Economics of Tourism**

Kristīne Bērziņa  
email [kristine.berzina@lu.lv](mailto:kristine.berzina@lu.lv)  
consultations in MsTeams Tuesdays 16.00-17.00,  
compulsory to apply for consultation in advance  
<https://ej.uz/konsultac>

  
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of the European Union

Details

Meeting in "General"

Published on 11/16/2020 by Kristīne Bērziņa

## 4 Course part Titles

- Introduction to the course video lecture recording
- Reading materials on the historical origins and development of traveling
- Historical origins and development of traveling video lecture recording
- Tourism system video lecture recording
- Reading materials on Tourism and the visitor economy in South Australia



- Reading materials on Analysis of macro environmental factors influencing the development of rural tourism: Lithuanian case
- Quiz on tourism origins and tourism system
- Tourism demand video lecture recording
- Reading materials on Future Traveller Tribes 2020 - Amadeus
- Individual task – analyses of one student trip by using Tourist behaviour analyses models
- Global trends class video lecture recording
- Reading materials on Travel&Tourism Economic Impact 2019 World WTTC
- Reading materials on Key International Tourism Numbers UNWTO 2019
- Reading materials on Travel Statistics to know in 2019-2020 TREKKURL
- Reading materials on Megatrends Shaping the Future of Travel Euromonitor
- Tourism supply. Tourism innovations video lecture recording
- Quiz on tourism supply side
- Task - Voting for the best presentation

## UL COURSE #2

# Enterprise creation and development

### 1 Context of the course

Course summary: Aim of the course “Enterprise creation and development” is to provide the opportunity to acquire the necessary knowledge to create business model canvas for own business idea and develop a business plan. The course provides an overview of business processes, creative business ideas generation and evaluation, understanding of successful start-up business model development and information included in the business plan. Course assessment provides business plan development and business idea pitch.

Number of ECTS credits: 6 ECTS

Area/field: Management

Level: Bachelor



**Enterprise creation and development**

6.0 ECTS

Fall semester 2020/2021

Faculty of Business, Management and Economics

University of Latvia

 **Business & Economics**

## 2 Implementation

- Synchronous part of the course “Enterprise creation and development” –lectures in MStearns platform, group tasks inbreakout rooms, quizzes, student group presentations
- Asynchronous part of the online course “Enterprise creation and development” included video lecture recordings, reading materials
- As the result evaluation online course “Enterprise creation and development” included Online midterm exam as well as Online exam.

## 3 Results

When the course “Enterprise creation and development” was promoted to Erasmus+ students, expectation was to have at least 10 students. In the fall semester of 2020/2021 online course “Enterprise creation and development” was chosen by 28 Erasmus+ mobility students from Greece, Italy, France, Taiwan, Spain, Germany, Czech Republic, out of 28 students, continued to study and received positive grade 24 students.

Anonymous student course quality evaluation organized by University of Latvia not separating Erasmus + mobility students from the local students. Still the course assessment indicated that students evaluated on average “Enterprise creation and development” online course in 7 point scale system as 6,23, which is above average evaluation in the field. About the content of the study course average evaluation was 6.23 from 7 points. For teaching the study course evaluation was 6.24 from 7 points.

Evaluation more in details:

- 6.4 points The content of the study course corresponded to the description of the course
- 6.2 points The content of the study course did not duplicate another course
- 6.2 points The suggested literature and materials were easily accessible and useful
- 6.2 points The materials available in the e-course helped in the acquisition of the study course, if the course did not have an e-course, the answer option “I don't know, I can't say” should be noted.
- 6.1 points During the semester, the examinations facilitated the acquisition of the study course
- 6.4 points The lecturer presents the course topics in an understandable way
- 6.3 points The teaching methods used by the teaching staff facilitated the acquisition of the study course
- 6.2 points The lecturer was available for consultations
- 6.2 points During the study course I achieved the study results recorded in the study course description
- 6.2 points I would like to take another course with this teacher
- 6.1 points Explanations of the teaching staff about the results of the tests are sufficient

**Course goals**

- ✓ Aim - provide the opportunity to acquire the necessary knowledge to create business model canvas for own business idea and write a business plan
- ✓ Overview of business processes, creative business ideas generation and evaluation, understanding of successful start-up business model development and information included in the business plan
- ✓ There are main defined goals for the course:  
to encourage young entrepreneurs to put their ideas in practice  
to develop competences and attitudes needed for entrepreneurship  
to foster networking among students  
to introduce students with the environment of the entrepreneurship and to prepare them for real business world

Details

Enterprise creation and development 02/11-22/12

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## 4 Course part Titles

- Course intro class video recording
- Reading materials on Business idea generation process, methods, creativity
- Business idea generation class video recording
- Reading materials on Start-up team building principles, dream team, team values



- Quiz on business idea team formation
- Successful teams class video recording
- Home reading from Course textbook: Business Model Generation
- Business model canvas class video recording
- Marketing class video recording
- Home reading The 5.2 billion dollar mistake by Steve Blank
- Home reading Competitive Analysis by Steve Blank
- Competitor analyses class video recording
- Potential customer research class video recording
- Client sketching class video recording
- Reading materials on Financial performance analysis
- Financial performance analysis class video recording
- Fundraising and pitch class video recording
- Reading materials on Risk analyses, MVP
- Reading materials on Difference Between Business Vision and Mission Statements
- Group Task on MVP - write what type of MVP that you will show in teams presentation
- Fundraising and pitch class video recording
- Business plan template