Interoperability within the European University Alliances

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Definition:

Interoperability refers to the ability of systems, institutions, or organisations to work together and exchange information effectively, even when they have different structures or technologies.

Differences of Interoperability on multiple levels, ie:

- \rightarrow Technical
- \rightarrow Organisational
- \rightarrow Cultural







The European Commission's perspective

- Support the creation of the European Education Area (EEA).
- Enhance mobility for students, researchers, and staff.
- Encourage data-driven decision-making, innovation, and exchange of best practices.



To foster a high-performing digital education ecosystem

To enhance digital skills and competences for the digital age











EuroTeQ Engineering University Interoperability within the European University Alliances

ENGINEER THE FUTURE WITH US





Initial members of EuroTeQ (Ecole Polytechnique included) New members of EuroTeQ 2.0





Tallinn University of Technology

Technion Israel of Technology Haifa, Israel

EuroTeQ work packages and tasks

Shared responsibilities & strong interlinkages







Building the EuroTeQ Campus

A holistic approach to integrate the campuses and educational systems of the six academic project partners towards a platform for open education, delivering high-quality research-led teaching to a peer group of over

115.000 students.

Our graduates will have intercultural and multilingual competences, an entrepreneurial mindset, think and act responsibly and are ready to lead a competitive Europe into the future.

We will jointly develop a EuroTeQ Campus for engineering education by:





Ambitious *mobility goal:* 50% of our graduates shall have a EuroteQ experience in 2030

EuroTeQ course – interoperability principles

Replicate and build upon good practice (and share our own)

- OEAPI, eduXchange.nl, MyAcademicID -
- Make the most of connections with partners across NL and EU -
- Only make something new if needed! -

Simplify and standardize

- Keep data exchanged to a 'minimum essential' list. The more (differing) data required, the more complexity between partners.
- Adapt our processes if needed, encouraging flexibility across partners -

Enhance the experience for all stakeholders

- Build for the future, and don't be too precious about existing solutions
- Make things work well at scale for students & staff quantity **and** quality -







Discover



Enhancing the visibility and comparability of diverse learning and mobility opportunities across HEIs, emphasising the importance of machine-readable metadata for easy comparison and discovery.

CMS (Website) Course catalogue

23.01.2025 _ 12

Curriculum management

ORIENTATION

EUROPEAN DIGITAL EDUCATION HUB



COURSE & RESOURCE PLANNING

Discuss

From <u>EDEH resources</u>



Vegodiate

European Commission



Apply and get recognition



Simplifying credit recognition and cross-institutional enrolment, emphasising seamless data exchange to support all forms of learner mobility and academic continuity.

Admissions Recognition

APPLICATION

EUROPEAN DIGITAL EDUCATION HUB

23.01.



From <u>EDEH resources</u>



European Commission



To create a joint course catalogue for the learner to choose from...

Visual provided by <u>www.interopvisual.eu</u>

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... a whole **invisible**

ecosystem is needed.

Colleagues are working together across four layers

Users & Services Organisation & Processes Applications & Information Technology

EuroTeQ course catalogue summary

Phase 1: Automated course data display

- Building on the existing structure of the manual course catalogue -
- Pull live course data from university systems to the EduXchange site, via SURF OEAPI -

Phase 2: Registration and Enrolment (testing)

- Students able to enrol with existing login details, via MyAcademicID _
- Enrolment to take place directly from catalogue -
- Any necessary student data exchanged between home and host universities

Phase 3: Grading

- Finding a suitable way for grades to be returned directly to the student, captured by both universities, and included along with their other grades

Aim: to enable scale and capacity, reducing manual complexity and bottlenecks. 'Seamless' experience for both staff and students. Align data and increase interoperability.



Take a course at a EuroTeQ partner institution

Availability depends on your current institution Where do you study now? Technical University of Denmark X École Polytechnique

Technion - Israel Institute of Technology

TU/e Eindhoven University of Technology



Ecole Polytechnique Fédérale de Lausanne

For professionals

Expand your professional skill-set validated by an official certificate!

EuroTeQ Engineering University



The EuroTeQ Engineering University builds on the belief that societal developments of recent years call for strong university alliances to make the knowledge square of education, research, innovation and service to society a reality and its impact a benefit to Europe and beyond.

More info on the EuroTeQ website 🖸





Explore the catalogue

Search Q	116 Results Sort by Name A-Z	~				
irst application period	Advanced Computational Eluid and Plasma Dynamics					
Enrollment open (0)		TU/e				
Starting soon (0)	investigate fluid and plasma flows and their dynamics from the micro- to the macro-					
cademic year	scales, under lam					
2024 - 2025 (67)	Course - 5 ECTS Enrolme	ent period closed				
arts in						
Sept 2024 (4)	Advanced Finite Element Simulations Using Abaqus	DTU				
Nov 2024 (4)	The course will introduce the use of the commercial finite element code Abaqus in a research-oriented way where a number of nonlinear problems will be addressed. The					
Feb 2025 (43)						
Mar 2025 (1)	focus will be					
Apr 2025 (19)	A more from families					
Jun 2025 (2)		ent period closed				
stitution	Advanced Robotics					
CTU (Czech Republic) (24)	Advanced robotics	TÊCH				
DTU (Denmark) (21)	convention. Electrical, hydraulic and pneumatic actuators and tools. Control and	ר)				
EPFL (Switzerland) (3)	sensing systems					
L'X (France) (2)						
TalTech (Estonia) (35)	Course - 6 ECTS No	current offering				
TU/e (The Netherlands) (14)						
) TUM (Germany) (17)	Agile BootCamp	92.5% S				
	Agile Bootcamp course teaches students the fundamentals of Design Thinking and	/ 👍				

Theme

Architecture and

other agile innovation principles. The course introduces three methods that work well together within...



Agile BootCamp

32QE-P-AGBC-01 Entrepreneurship

About this course

Agile Bootcamp course teaches students the fundamentals of Design Thinking and other agile innovation principles. The course introduces three methods that work well together within the same cross-functional team: Design Thinking, Lean Startup and Agile across teams. In the main part, it will offer the right tools and techniques for the design and implementation of Design Sprints, including a practical test of the entire process.

Learning outcomes

Specific activities during the one week intensive hands on remote digital laboratory (in modes of work for remote or hybrid collaboration):

- Using one of the very effective tools for remote collaboration running interactive online workshops, mapping, brainwriting incl. voting and meetings in Miro digital whiteboard (or by Mural, both as remote collaboration tools) - excellent tools for Design Thinking process, which can be integrated into MS Teams or used alone.
- Understand what Agile is and the Agile planning Principles
- Learn the Fundamentals of Design Thinking and other agile innovation principles
- Experiencing UX and UI Design
- Learn Design Sprint methods in a four-day hands-on intensive laboratory
- Develop intensive online collaboration skills.

Course requirements

Preliminary acquaintance with the overall concept (https://www.thesprintbook.com/) and introductory acquaintance with the possibilities of collaborative tools (Miro and Figma). An introduction to this course - introductory onboarding of all students on the first day of the course - will be devoted to this introduction to the overall framework.

Additional information for self-study would be sent to all participants a few weeks/days before the start in order to enable the smoothest possible entry into the course. Our goal



Æ	CTU CZECH TECHNICAL UNIVERSITY IN PRACUE	
cours	se	đ
3 ECT	rs	D
Ē	Contact hours per week 1	
μ	Instructors Ing. Skokanová Dagmar P Fanta Petr Ph.D., Ing. Jílka Ph.D.	h.D., Ing. ová Petra
	Mode of delivery Hybrid ⑦	
lf anytł <u>of CTU</u>	hing remains unclear, please check <u>(Czech Republic)</u> .	<u>the FAQ</u>
tartin	ig dates	
17 F ends	eb 2025 21 Sept 2025	\sim
▲	Course is currently running	:
* Vie (Cze	w scheduling details of CTU ch Republic)	
These	e offerings are valid for stude	nts of

Star

17 en

The TU/e (The Netherlands)







Enrollment EuroTeq



Technical summary





Technical summary



OEAPI as a standard for unlocking educational data: from course offerings, to grades, to credits, from timetables to free workplaces

SURFeduhub as a central location where educational data from an institution can be offered to various data users in a uniform and secure manner

eduXchange.nl as a front-end for displaying educational resources

eduID as an umbrella for digital student identity, independent of an institution

Enrollment receiver for secure exchange of personal data between institutions



Platform eduXchange

A	В	L C	D	E
 Field in current man pilot course catalogi 	ual Corresponding field in ue OOAPIv4	Comments/questions	Comments from working group 2.1	IT decision/comments
3 Internal course code	Courses.Abbreviation			
Title of course (as it a	opears Courses.Name			
5 6 Level [tickboxes] 7 8 9	Courses.Level	Note: Tickboxes are not possible, you can only choose one level.	Reaction DTU: This is problematic, since one course at DTU can be subject for both BA and MA or MSc and Ph.Dstudents.	Single value "secondary vocational education 3" "secondary vocational education 4" "associate degree" "bachelor" "master" "doctora -> Enter the lowest value/minimum value (i.e. enter 'Bachelor', if it is open to bachelor and Master). Treat as required field.
not in current catalogu	e CourseOfferings.Academics	Describes the educational unit (semester, quartile etc) in which the course is delivered. Suggestion to add.		
Amount of ECTS cred	its Courses.Ects		Technion does not work with ECTS. Technion can make a calculation based on work hours, but the transcript of	



Course data – example of agreed EuroTeQ 'themes', levels, etc.

Mode of Delivery (set list): "Online - at a specific time"

"Online - time-independent"

"Hybrid": EuroTeQ students attend online, local students attend on campus.

"Blended"

Course Level (set list): "Bachelor" "Master" "Dectorel"

"Doctoral"



EuroTeQ course catalogue Enrolment data

A 🖌	В	C D	E	F	G	Н		J	K
	ooapi	description	ctu	dtu	ľx	taltech	technion	tue	tum
			incoming	incoming	incoming	incoming	incoming	incoming	incoming
/PERSON/I	ME								
person									
i .	givenName		given name	first name	first name	first name	first name	first name	first name
	surName		family name	last name	last name (as written on pass	last name	family name	last name	family name
<u> </u>	dateOfBirth		dateofbirth	dateofbirth	dateofbirth	dateofbirth		•	dateofbirth
	cityOfBirth				place of birth				place of birth
0	countryOfBirth		countryofbirth						
1	nationality		nationality	nationality	nationality	nationality		 (citizenship for visa c 	nationality
2	mail		email	email	email	email	email	•	email
3	mobileNumber		phone			phone		** (helpful for actually	phone (mobile)
4	gender		gender	gender	gender	gender		•	gender
5	address	additional, postalCode, city, countryCode, geolocation	Address		home address			home address	address (optional)
7	primaryCode	studentId of Home						tue student number	tum id
8	otherCodes	cardId	number of id/pass	ort		passport number			
9	otherCodes	personalId				personal identy number			
1	euroteq extensio	on			years of study @ HE	number of HE years			
2	euroteq extension	on			previous international travel				
3	euroteq extensio	on			family members in france				
4	euroteq extensio	on						copy passport	
5	euroteq extensio	on					special needs		special needs
6	euroteq extensio	on							english skills
7	euroteg extensio	on							how did you learn about euroteg o

- How do we align and simplify?
- What makes the most 'seamless' experience for students and staff involved in the process?



Course data – example of agreed EuroTeQ 'themes' University Also the target group extension object should be added to the course object. The ext object for educatinge courses has

 \equiv



Q Type to search

- ✓ Home
- ✓ Community
- ✓ Governance
- ✓ The specification
- Technical information \sim
 - > Data model
 - > Major changes since v4
 - Changelog \geq
 - > Implementation
 - > About identifiers

the following attributes:

- targetGroup an array of targetgroups for all the alliances this course is offered for. Each targetGroup is an object with the following attributes:
 - **name** : (required) the name of the alliance, allowed values are "euroteq" Ο
 - theme : the theme of the course within the alliance, allowed values are: Ο
 - "Architecture and Construction"
 - "Business and Economics"
 - "Chemistry and Biology"
 - "Computer Science and ICT, Data, AI"
 - "Electrical Engineering"
 - 'Entrepreneurship"
 - "Food and Health Sciences, Medical engineering"
 - "Languages and Culture"
 - "Manufacturing and Processing"
 - "Mathematics and Statistics"
 - "Mechanical Engineering"
 - "Physics and Energy"
 - "Transport"
 - "Other subject area"



EuroTeQ interoperability Handling complexity – technical & semantic

- **Use of OOAPI** building upon existing good practice, and proven functionality in an alliance setting. Lots of practical support for connecting university systems.
 - Willing to align with others to aim for a European standard
- **Adaptation for alliance tasks** Amendments to make data relevant to international mobility; tailoring back-end systems and associated processes
- **Using existing suitable tools** MyAcademicID for authenticating students, allowing automated enrolment (supported by GEANT). Already implemented by several partners for Erasmus Without Papers work.
- **Alignment on data requirements** *jointly agreed in alliance*

Hurdle or mountain? Some obstacles are easier to move than others.





EuroTeQ interoperability Handling complexity – legal & organisational

- Privacy, Legal, Procurement all still offer complexity across the alliance
- Differences between partners decision-making processes, national/regional factors
- 'Immovable' obstacles some differences are baked in and not easily changed, e.g.





across the alliance esses, national/regional factors n and not easily changed, e.g:

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EuroTeQ interoperability Handling complexity - Strategic approach

- Thinking long term, not just a 'quick fix'
 - E.g. Principle of no central data storage; Aim for best practice, not workarounds.



- Working through (or around) complexity
 - E.g. Where possible, jointly agree solutions across the whole alliance
- Viewing through different lenses local, national, international
 - Individual universities in similar position each works across these different arenas



EuroTeQ interoperability Alignment across Europe

We're trying to find the benefits of staying connected

- **SURF & Dutch partners** (e.g. Adapting OOAPI for international use; EWUU alliance) •
- **EDEH** (European Digital Education Hub; interoperability framework, implementation quidelines and resources)
- **FOREU4ALL** (Fostering collaboration and share best practices between EUAs)
- **QualityLink** (Aligning technical standards, and EU-wide course data aggregation)
- **NRENs & GÉANT** (Supporting partner universities in other countries; integrating existing EU-wide tools like MyAcademicID)
- eduXS (A repository of data on European Higher Ed digital infrastructure, mapping projects, standards, and relationships)
- **Other individual alliances** (Sharing experience with those tackling similar use cases)

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EUROPEAN PARTNERSHIP FOR AN INNOVATIVE CAMPUS UNIFYING REGIONS

Realizing Interoperability within the EPICUR Alliance

David Pho

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



Flow of Presentation

- Introducing the EPICUR Alliance
- EPICUR's vision, priorities and methodology for digitalization
- Interoperability in HE and European Strategy for Universities
- EPICUR Challenges and Solutions
 - EPICUR mobility process
 - EPICURUS (EPICUR Unified System)
 - Main Standards or Specifications supported by EPICUR
- Dissemination and exploitation of EPICUR's outputs





EPICUR ALLIANCE | SINCE 2019

EPICUR Shaping New Ways of Sharing Teaching & Learning across Europe

- 1st Generation European Universities Alliance
- 9 Partners | 7 countries | 6 languages
- Focus on Interdisciplinary Education
- Multilingual European Classrooms
- Flexible Mobilities
- Inter-University Campus



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- 1. University of Strasbourg, France
- 2. Aristotle University of Thessaloniki, Greece
- 3. University of Southern Denmark, Denmark
- 4. University of Amsterdam, The Netherlands
- 5. Adam Mickiewicz University, Poland
- 6. University of Haute-Alsace, France
- 7. Karlsruhe Institute of Technology, Germany
- 8. BOKU University, Austria
- 9. Albert Ludwigs University of Freiburg, Germany





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The EPICUR SHAPE-IT Project (Nov 2022 to Oct 2026)

- Drawing on EPICUR's pilot phase achievements, 7 work packages (WPs)have been designed to achieve:
- An agile and inclusive governance integrated with member universities' bodies and ensuring quality assurance and buy-in within alliance communities (WP1), together with a comprehensive impact assessment policy (WP7)
- Support infrastructures and services for digital cooperation (WP3) and **mobility** (WP2)
 - Lead WP2 (Re-) Shaping European Mobilities: University of Amsterdam
 - Lead WP3 Reinforcing Digitalisation: Aristotle University of Thessaloniki
- A vision articulating purpose, formats and procedures for education (WP4), research- and transfer-oriented training (WP6) and societal engagement (WP5).





Vision for an Inter-University Campus

- A central gateway for EPICUR
 - Alliance to offer flexible mobilities
 - Universities to share courses
 - Professors to communicate with students
 - Students to apply for and attend courses
 - Admin staff to monitor mobilities
 - ... in a harmonized way







Main Priorities of EPICUR Digitalization



Interconnect Learning Management Systems

Electronic secretariat to support the mobility office interconnected with local Campus

Create Hybrid Classrooms with common specifications to support the same hybrid



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





Strasbourg, 18.1.2022 COM(2022) 16 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on a European strategy for universities



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



European Strategy for Universities

In the next decade we need to make 'connected universities' a reality.

- Co-development of guidelines and principles
- for allowing mutual access to services and enabling seamless knowledge and data exchange reflecting the need for

interoperability

and openness







Interoperable Student Mobility Process in EPICUR



Step 4: Course selection and establishment in VURS

Step 8: Student selection

Step 12: Mobility credits assignation





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



Deploying the Mobility Process: EPICURUS (EPICUR University System)

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





University System Challenges



EPICUR University System Challenges







Main Challenges

- Unified access
- Centralized CMS
 - electronic secretariat
 - interconnection with local CMS for a common course catalogue
- Decentralized LMS
 - virtual space for slides, quizzes, announcements, ...





Solutions!

- Unified access
 - Single Sign On using institutional account and MyAcademic **ID/EduGAIN**
- Common CMS
 - Virtual University Registrar System (VURS)
 - Creation of interfaces to exchange course data with local CMS
- Decentralized LMS
 - Virtual Campus Learning Platform (VCLP)





EPICUR Inter-University Campus Solutions



EPICUR University System Solutions





Local LMS

EPICURUS - VURS

	Course Catalogue
Candidates App	
	Students App
Registrar App	
	Faculty App
Administration Panel	8

- **EPICUR** students.
- Students Арр learning pathways.
- Арр Registrar learning pathways and students mobilities.
- **EPICUR** learning pathway.
- roles of the rest of the users.

Course Catalogue (https://courses.epicur.auth.gr): Public course catalogue of all learning pathways offered to the

Candidates App (<u>https://register.epicur.auth.gr/</u>): The application for the prospective students to apply for participation in the EPICUR learning pathways.

(https://students.epicur.auth.gr/): The application for the selected students attending the EPICUR

(https://registrar.epicur.auth.gr/): The application for the administrative staff to monitor EPICUR

Faculty App (<u>https://faculty.epicur.auth.gr/</u>): The application for the teaching staff delivering a course that is part of an

Admin Panel (<u>https://registrar.epicur.auth.gr/</u>): A specific part of the application for the Registrar App to admin the rights and

EPICURUS



Main International and European Standards or **Specifications supported by EPICUR**

- European Learning Model (ELM) is used by VURS for the EPICUR Learning opportunities
- VURS APIs supports interoperability with CMS and LMS via 1EdTech's OneRoster standard
- VURS supports MyAcademicID for student's authentication







Conclusions

- Before the Digitalization of a process define the process
- Take into account the interoperability issue and follow standards and well-defined specifications
- Follow a stepwise approach and a solid methodology
- EPICUR has faced many challenges and presented some solid outputs
 - EPICUR mobility process
 - EPICURUS (EPICUR Unified System)
- There are European and international Initiatives related with Digitalization





Creating transformational impact:

Dissemination and exploitation of EPICUR's shareable outputs and deliverables

- Internal policy and support system for dissemination and exploitation
 - Strategic framework and procedures
 - Support tools for dissemination and exploitation (templates and use cases)
 - Organizational support for implementation
- New partnerships with peer alliances
 - Requests for partnerships (Virtual Campus, VURS)
 - Open to new partnerships to create bigger impact jointly
- Interested to partner with the EPICUR Alliance on digital cooperation:
 - Prof. Thrasyvoulos Tsiatsos, WP3 Leader in Reinforcing Digitalization, Aristotle University of Thessaloniki: tsiatsos@csd.auth.gr
 - David Pho, WP7 Task leader Dissemination & Exploitation, University of Amsterdam: y.c.d.pho@uva.nl



