IT4SSM : IT for Smart and Sustainable Mobility

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Cofinanciado por la Unión Europea

SUMMARY

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Goals & Partners

Goal & Partners

- IT4SSM aims to provide knowledge and practical training in new techniques, technologies and skills for the analysis, design and development of new algorithms and software for decision support in **smart cities**.

- 4 universities, 40 professo

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History of the Development

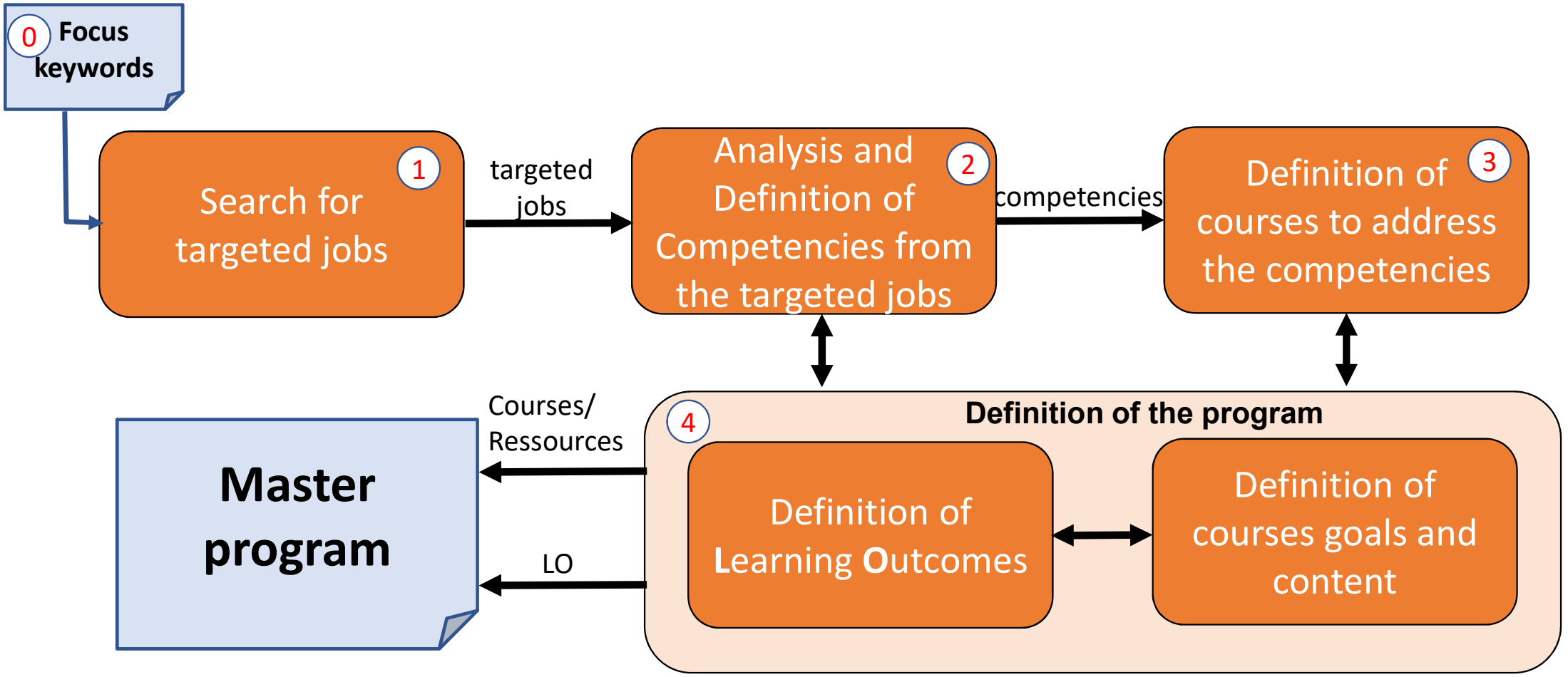
History of the development

Oct/2021	Nov-Dec/2021	Jan-Feb/2022	Mar-Apr/2022	May/2022	Jun-Aug/2022	Sep/2022
Presentation EUNICE Master M.Abed S.Grondel CaféInfo	Definition of the working group (16 PR/MDC) and **start of work identifying masters in smart City**	Meeting: -Focus of the master -PR/MDC Commitment - Director of INSA/UPHF **Partners identification**	Individual meetings: U.Cantabria U.Vaasa U.Catania U.Poznan	- Weekly remote meetings - **Presential meeting 31/05/2022 Eunice workshop**	- Meetings by sub-group For drafting of courses' content - Feedback meeting and programme development	- Meeting different levels of direction at INSA-UPHF - Submission of study guide

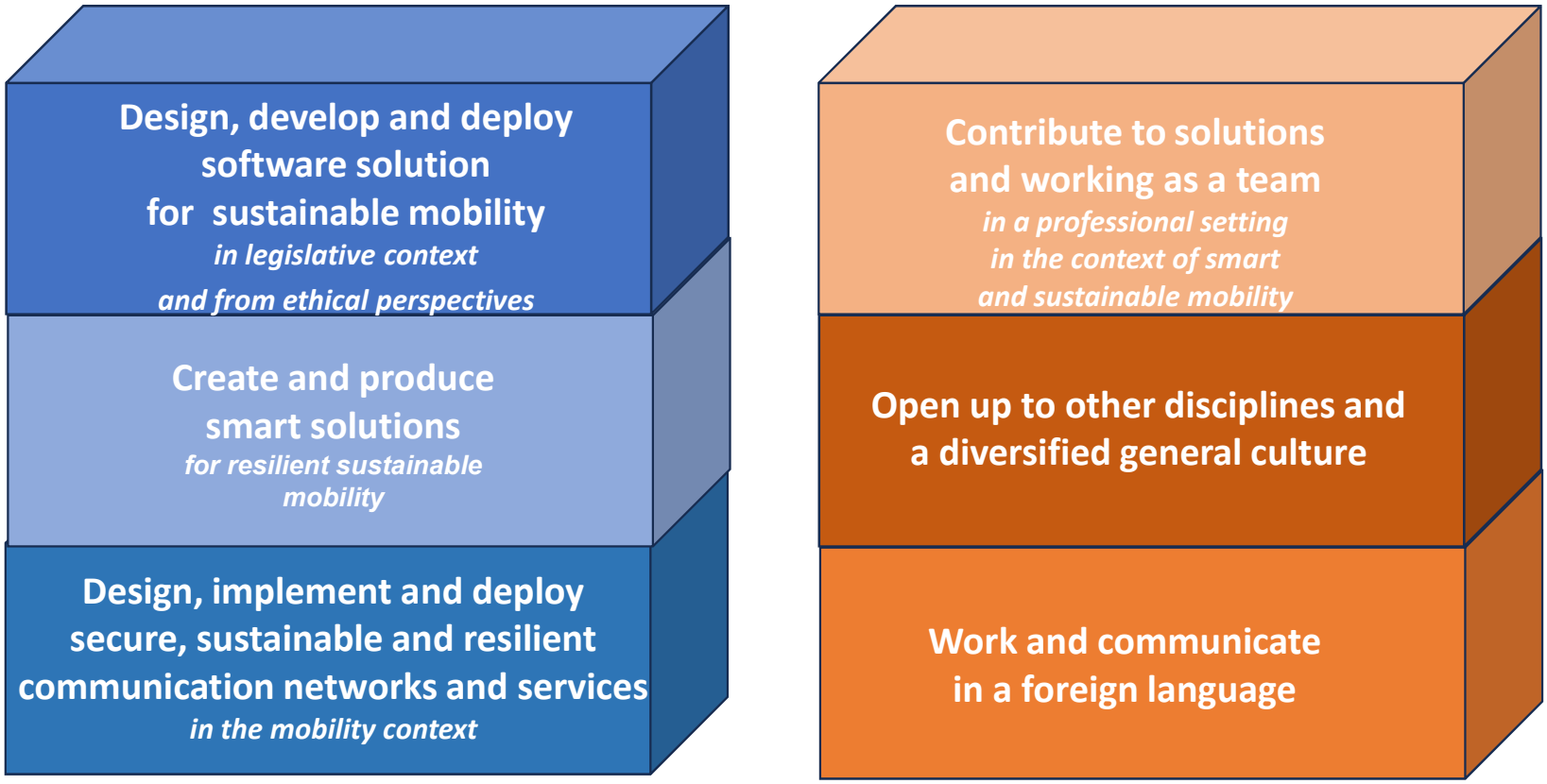
Jan/2023	Apr-May/2023	Jun-Oct/2023	Oct/2023	Jan-Apr/2024	Mar-Jul/2024	Sep/2024
- Approval of the master by EUNICE - Meeting: A. Artiba	Definition of a strategy for sustainability - U.Cantabria - U.Vaasa - U.Poznan	Signing of agreements between the 4 partners	**Accreditation In France** Making UPHF & UC academic rules compatible	**Accreditation in Spain** Communication In France	Application and selection of students	- **Start of master's degree** **Here, we are!**

Methodology

Competence-based process for the Master definition



② Synthesis of competencies



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④ The master program

- Example of course content description in the study guide

Course Title	Cryptography fundamentals (M4-S8)
Learning outcomes	LO3: Design, implement and deploy secure, sustainable and resilient communication networks and services in the mobility context - Design, implement, deploy and assess the security framework which fulfils the requirements imposed by both users and services.
Goal	Leveraging on the symmetric and asymmetric cryptographic algorithms this module will provide the main protocols and techniques implemented on existing and future networks. Last but not least, one course has been allocated for addressing network security management.
List of subjects to be presented to the students	• Introduction to modern cryptography principles • Block and stream ciphers • Groups, rings and finite fields. • The AES algorithm • Introduction to number theory: Modular arithmetics. Fermat's and Euler's Theorems. Discrete logarithms. • The Diffie-Hellman protocol • The RSA Algorithm • Elliptic Curve Cryptography • Hash functions: SHA standard • Introduction to quantum cryptography
Number of hours	Number of hours for teaching class: 24 Number of hours for practical classes (lab, exercises, etc): 12 Total 4 ECTS Semester 8
Type of evaluation	Written exam
Potential professors	• Antoine Gallais, INSA-UPHF • Youcef Imine, UPHF • Luis Muñoz, UC

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Difficulties & Solutions

Difficulties & Solutions

- Who wards the diploma ?
- Where will the students be enrolled ?
- Who finance the master ?
- How to make the master viable ?
- What about the price for the students ?
- Need to adapt to the new rules of the INSA-UPHF master
- Operationalization of a course given by several institutions

- **European "joint program"**
- **Co-Diploma**
  - 2024 : UPHF + UC
  - 2025 : UPHF + UC + PUT
- Students enrolled in UPHF/UC (2024)
- Presential classrooms at UPHF/UC (2024)
- Internship in PUT/UVA/UPHF/UC
- Each partner **finances** the lesson hours of its teachers
  - Defining EUNICE modules
  - Other students can also follow the IT4SSM specific courses
  - Mobility of professors of PUT and UVA for teaching (possibility by Erasmus)
- Most of courses given by only one institution

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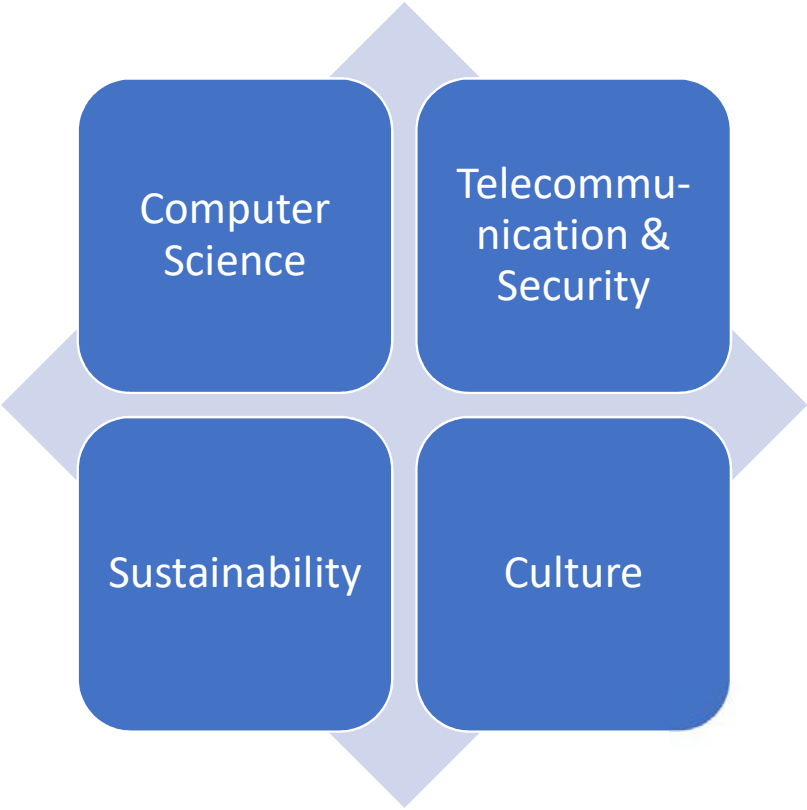
The Master Program

The Program

- 120 ECTS
- 4 semesters
- Teaching in English
- Hybrid mode (comodal courses)
- Internship mobility



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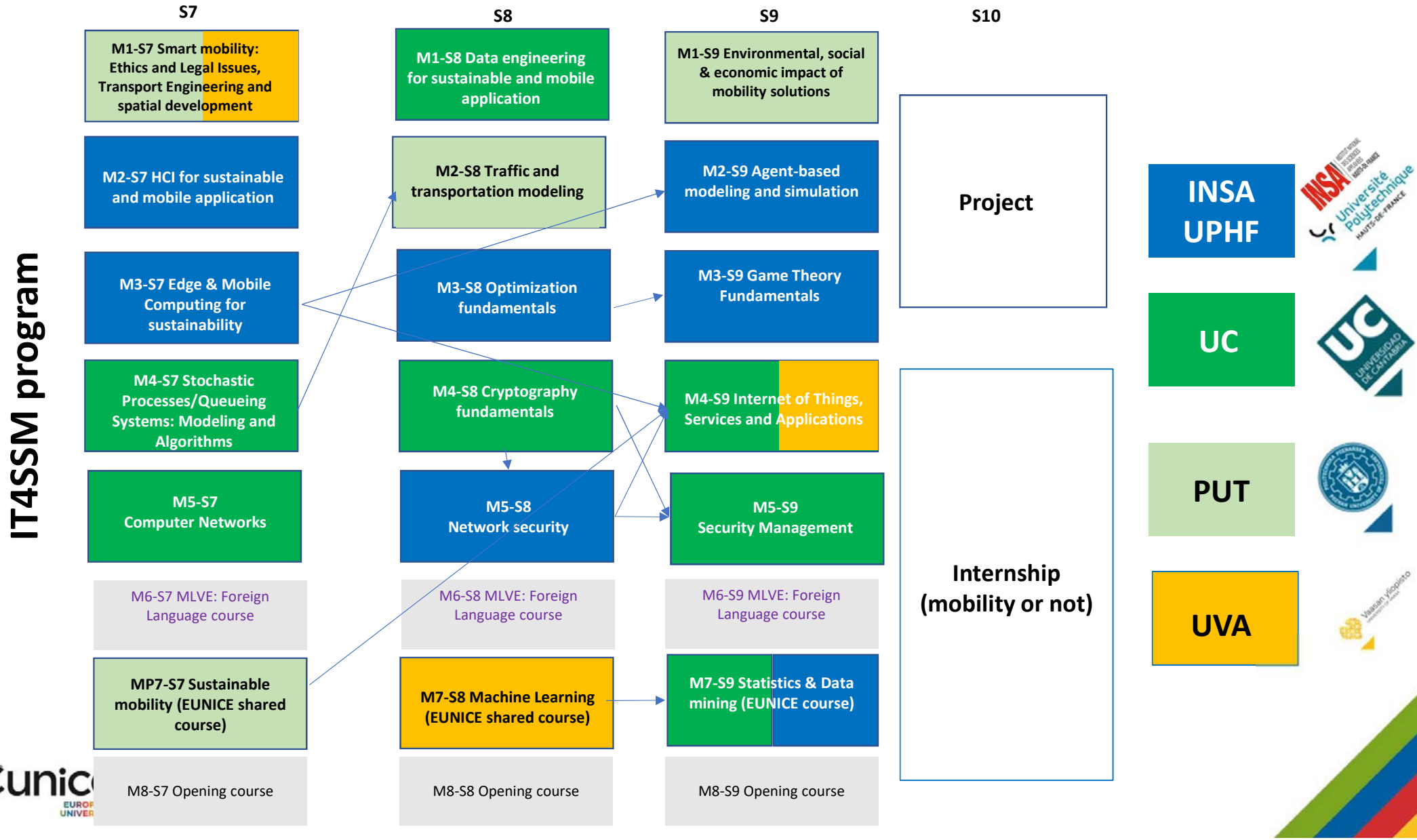
IT4SSM program
S7
S8
S9
S10
M1-S7 Smart mobility: Ethics and Legal Issues, Transport Engineering and spatial development
M2-S7 HCI for sustainable and mobile application
M3-S7 Edge & Mobile Computing for sustainability
M4-S7 Stochastic Processes/Queueing Systems: Modeling and Algorithms
M5-S7 Computer Networks
M6-S7 MLVE: Foreign Language course
MP7-S7 Sustainable mobility (EUNICE shared course)
M8-S7 Opening course
M1-S8 Data engineering for sustainable and mobile application
M2-S8 Traffic and transportation modeling
M3-S8 Optimization fundamentals
M4-S8 Cryptography fundamentals
M5-S8 Network security
M6-S8 MLVE: Foreign Language course
M7-S8 Machine Learning (EUNICE shared course)
M8-S8 Opening course
M1-S9 Environmental, social & economic impact of mobility solutions
M2-S9 Agent-based modeling and simulation
M3-S9 Game Theory Fundamentals
M4-S9 Internet of Things, Services and Applications
M5-S9 Security Management
M6-S9 MLVE: Foreign Language course
M7-S9 Statistics & Data mining (EUNICE course)
M8-S9 Opening course
Project
Internship (mobility or not)
INSA UPHF
UC
PUT
UVA

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