



**International double diploma  
in computer science  
For L3 info, M1 info, M1  
MOSIG**

October 2023

# Information meeting : international Double diploma in CS

## 1. Key elements of international double degrees

a. What is a double degree?

b. How to apply

## 2. Focus on the international 3 +1 DD :

a. Composition of the partnership

b. Strong points

c. The programs

# 1 - Key elements of international double degrees, DDI

- **What is a double degree?** A jointly designed study program
  - Dual degrees: two institutions award degrees in the same field,
  - Two Master's degrees for 120 ECTS: one from UGA, the other from the foreign partner.
- Mobility of at least 1 year, with or without extension of the study period.
- 60 ECTS acquired abroad, 60 ECTS acquired at UGA.
- Course program already established, no possibility of choosing UE outside this framework.
- **Countries involved in the project:**
  - **Japan: University of Tsukuba**
  - **Mexico: University National Institute for Astrophysics, Optics and Electronics (INAOE), Tonantzintla, Mexico**
  - **(Russia: Moscow Institute of Physics and Technology)**
  - **United Kingdom: Swansea University**

# 1 - Key elements of international double degrees, DDI

- General conditions for application:
  - At least B2 level in English. Level C1 is recommended.
  - Learning the language of the host country is recommended,
- Academic requirements
  - To apply: good academic record - at least 12/20 and no marks below 10.
- During the DD :
  - Insufficient marks, even without failure, will result in withdrawal from the DD.
  - If you fail during the mobility period, you will be withdrawn from the DD and you have to repeat the year at your home university.
- Application file :
  - School leaving certificate and transcripts of grades from post-bac studies
  - CV in English
  - Covering letter with professional project
- After selection
  - Identity papers (in particular a passport)
  - Civil liability and mutual insurance covering travel (and work placement) abroad and repatriation, European health insurance card
  - Apply for scholarships

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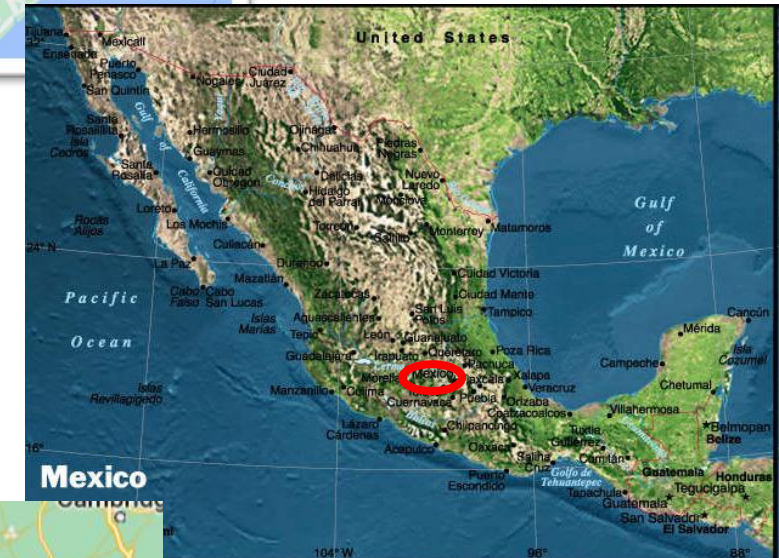
c. The programs

# International Double diploma in CS

- **Japan: University of Tsukuba**



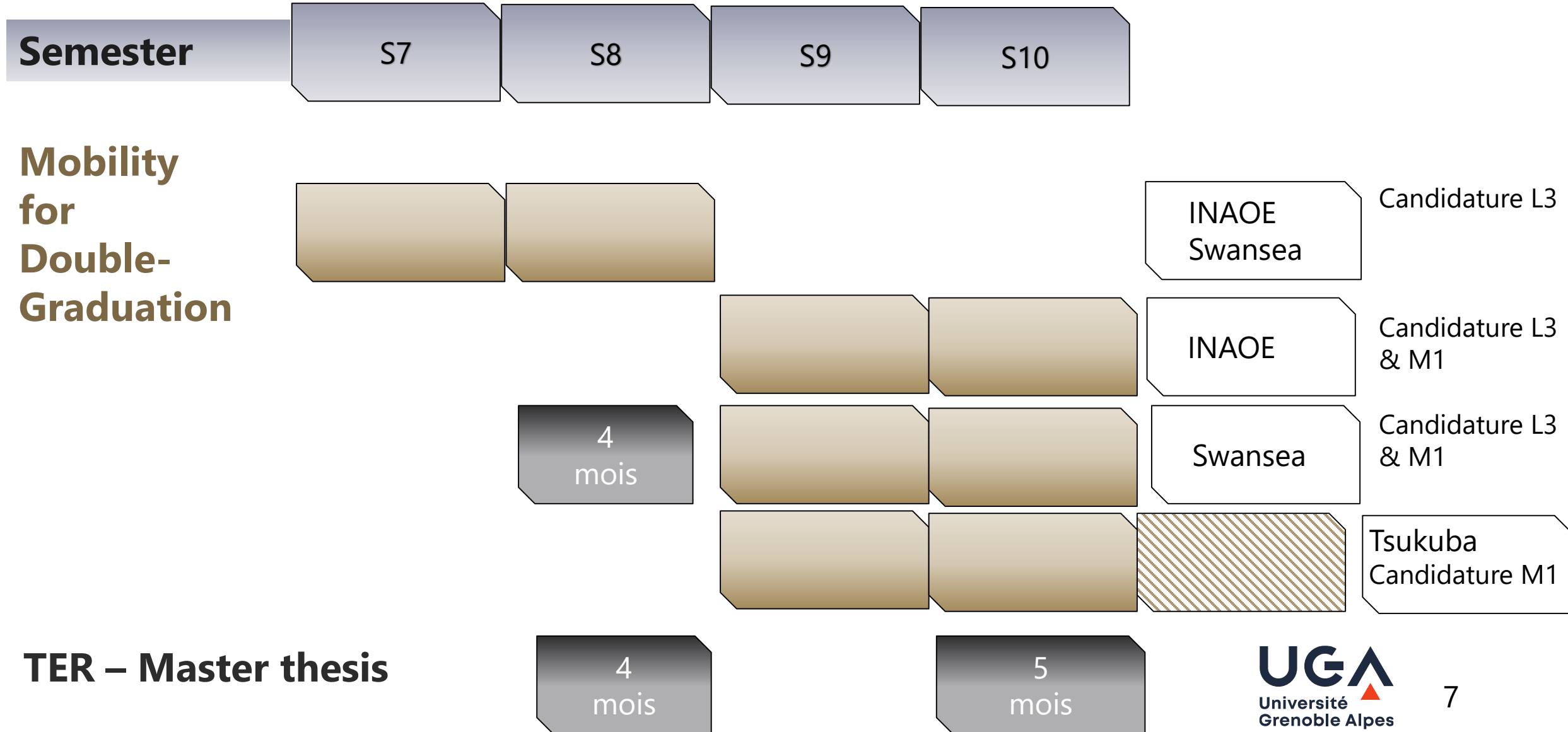
- **Mexico: University National Institute for Astrophysics, Optics and Electronics (INAOE), Tonantzintla, Mexico**



- **United Kingdom: Swansea University**



# 2 – Mobility schema :



# 2-Master informatics in UGA

M1

Informatique



MoSIG



M2

Génie Informatique



CSI



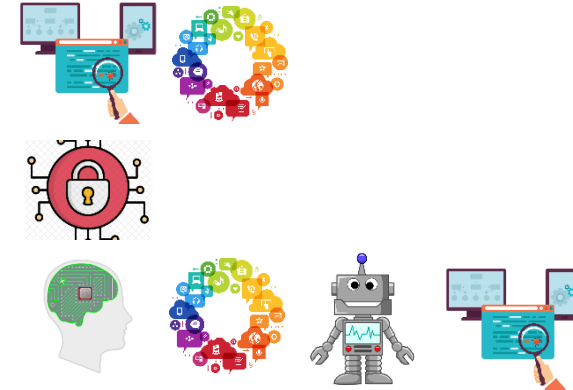
MoSIG



ORCO



Cybersecurity



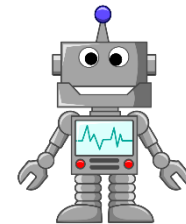
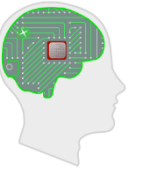
- Data science and Artificial intelligence (DSAI)
- Distributed computing: from cloud to edge computing, embedded systems and networking (DC)
- Human and digital world interactions: robotics, augmented and virtual reality, perception (HDWI)
- Software and hardware components engineering ; quality engineering, models of computation (SHCE)







## 2- Reminder CS & CE domains in UGA

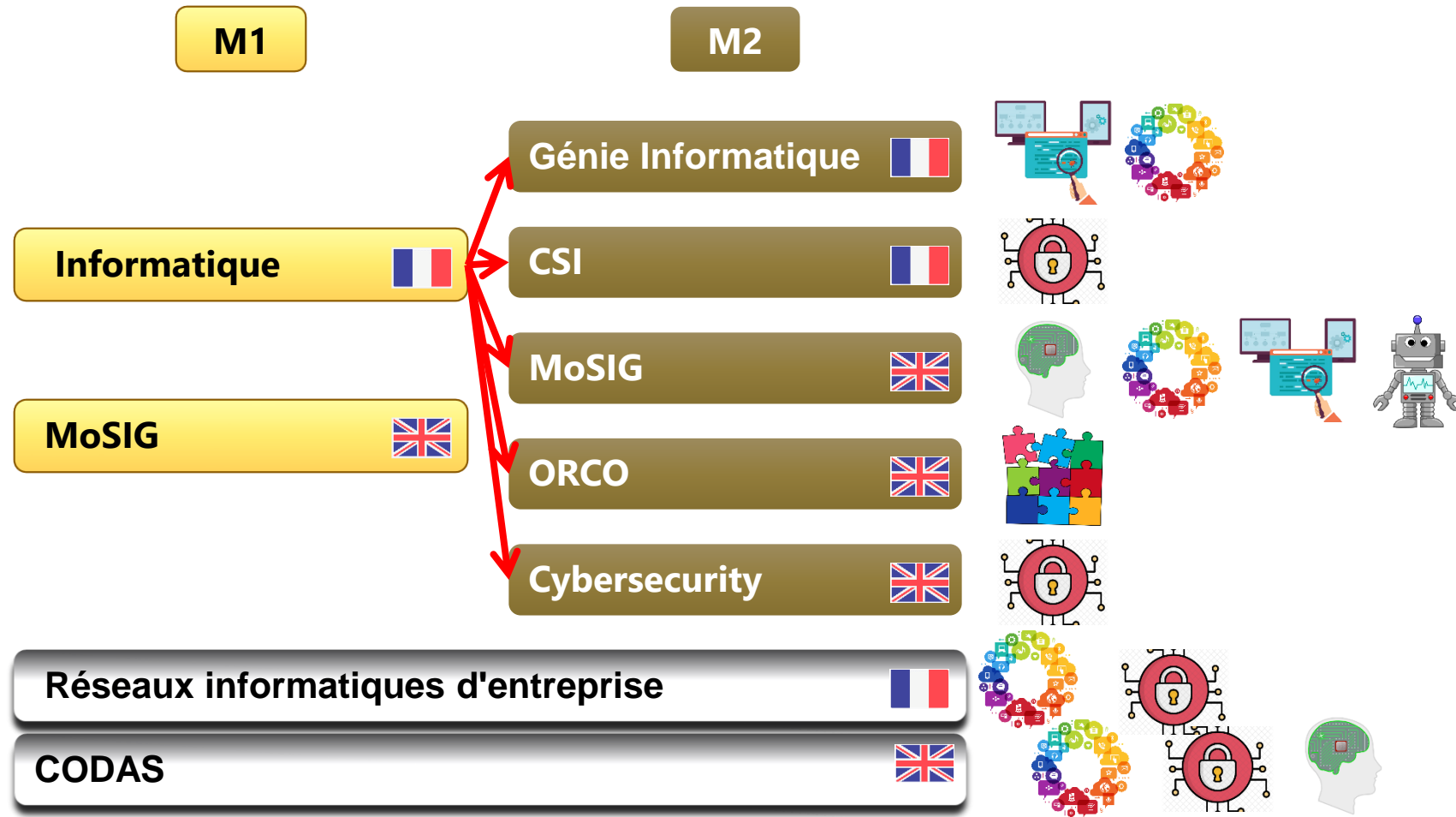
- **Artificial Intelligence** and **data science**: machine learning technics, knowledge representation, AI architecture
- **Distributed computing**: cloud computing, distributed systems, networking, parallel system
- **Cybersecurity**: security, cryptography, data protection
- **Software and hardware components**: software and hardware, quality, software engineering
- **Human & digital world** : robotics, virtual reality, perceptions
- **Modelisation and optimisation of complex systems**: combinatorial optimization, heuristics, problem solving methods



# 2-Reminder : The first year of the CS Master in UGA

- Available in English or French
  - Master 1 Informatique 
  - Master 1 Mosig 
- Fundamental knowledge
  - Programming, compilation, database, networks, software engineering, object design, system
  - Introduction to research
- Options to build a "colour" and a culture: a choice of 7 options among 19
  - Big data, cryptography, artificial intelligence,
  - man-machine interface, networks, distributed systems,
  - operations research, digital systems,
  - image synthesis, robotics, parallel algorithms, DevOps ...

# 2-Reminder : The 2nd year of the CS Master in UGA

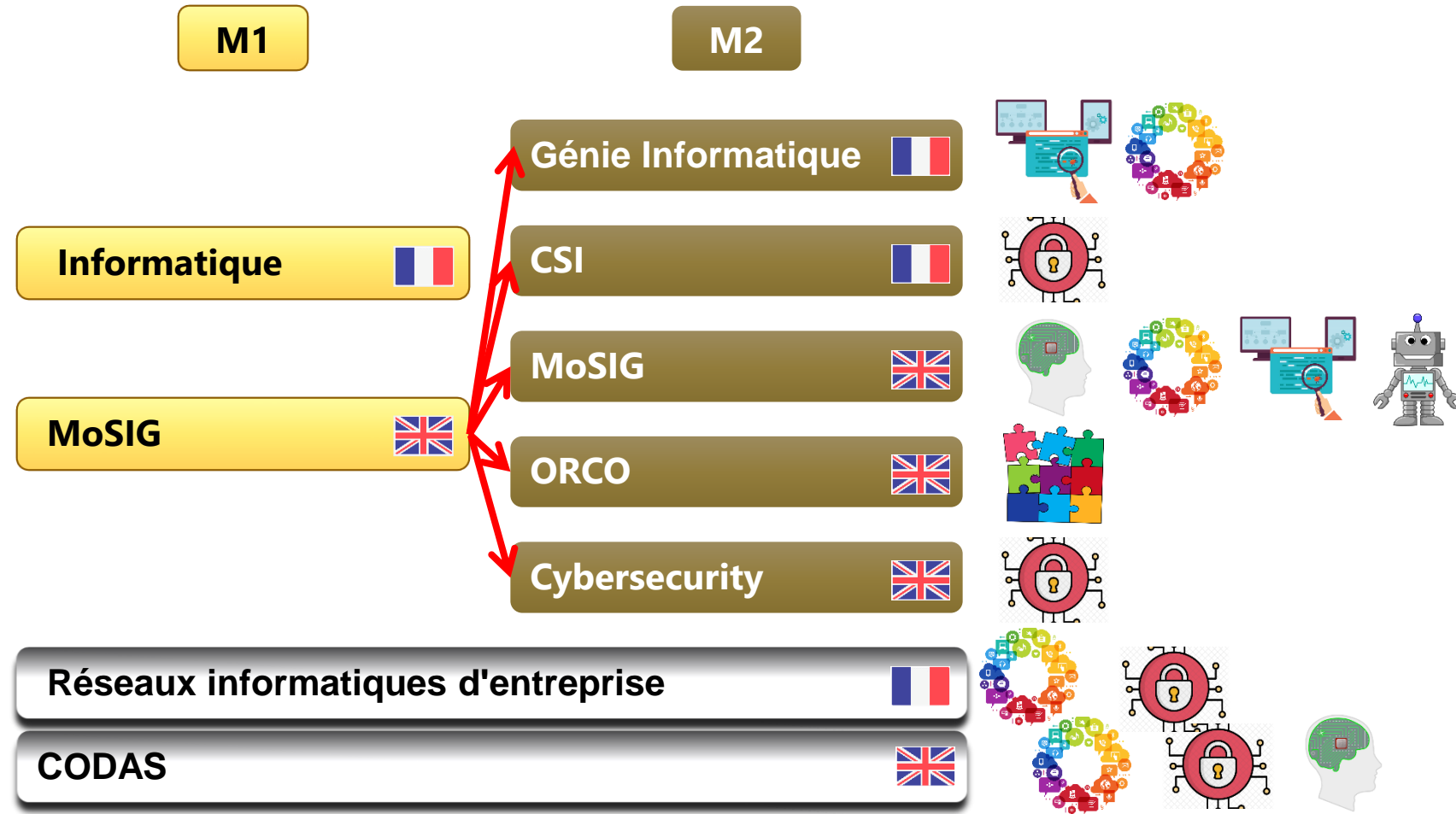


## Organisation

30 ects : courses 1<sup>st</sup> semester,

30 ects : research or professional project, 2<sup>nd</sup> semester

# 2-Reminder : The 2nd year of the CS Master in UGA



## Organisation

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**DD : Don't look after an  
equivalent program !!!!**

- Notable differences :
  - The academic year begins in April and finish in April (2 years and half)
  - The course program is based on research seminars
  - The master's thesis is done largely independently in Tsukuba







- Programme de cours at UT :

Semester 2, May-Sept, Full time research work, 3 UTC research 6 ECTS (transferred)  
Mandatory

- Seminar in Computer Science s (1 UTC) , Research in Computer Science Is (2 UTC)

Semester 3, Oct-Mar, Course work + research work Mandatory 3 UTC research 3-5 UTC courses 30 ECTS (transferred) :  
Mandatory

- Seminar in Computer Science f (1 UTC), Research in Computer Science If (2 UTC)

Elective

- Data Engineering I (2 UTC), Advanced Course in Computational Algorithms (2 UTC), Programming Environment (2 UTC), Fundamental Computational Biology (2 UTC), High-Performance Computing (2 UTC), Human-centered AI B (1 UTC), Computational Science Literacy (1 UTC)

Semester 4, Apr-Sept, Course work + research work 3 UTC research 3-5 UTC courses 30 ECTS (transferred):  
Mandatory

- Research in Computer Science IIs (3 UTC)

Elective 6-10 ECTS courses 20-24 ECTS research

- Experiment Design in Computer Sciences (2 UTC), Principles of Software Engineering (2 UTC), Numerical Simulation (2 UTC), Adaptive Media Processing (1 UTC), Topics in Computer Science I (1 UTC), Human-centered AI A (1 UTC)

Semester 5, Oct-Mar, Full time research work  
Mandatory

- Research in Computer Science II f (3 UTC)

Master's thesis final defence 3 UTC research



- Differences :
  - Students pay registration and tuition fees at their home university; no registration nor tuition fees will be asked by the host university.
  - Japanese legislation requires that all the foreigners who reside exceeding three months in Japan subscribe to the National Health insurance. In addition, all regular students in UT will have to subscribe to student insurance which covers accidents and injuries during the academic and research activities.

- Tonantzintla, a small historic town
  - 10 minutes from Cholula
  - 30 minutes from Puebla
  - 2 hours drive to Mexico City



# INAOE University



1st year – Semester 7 (Fall Term)

1<sup>st</sup> year – Semester 8 (Spring Term)

	INAOE	EC	UGA-MOSIG	ECTS Credits
Basic (obligatory) courses	Mathematics for CS	6	Mathematics for CS	3
	Design and analysis of algorithms	6	Algorithms Problem Solving	3
	Artificial Intelligence	6	Programing Lang and compilers design	6
	Machine Learning	6	Software Engineering	3
Seminars	Research seminar 1	2	op Tech	
Optional courses			Prog OS pr	
Total credits		26		

	INAOE	EC	UGA-MOSIG	ECTS Credits
Optional courses	Option 1 - spring	6	Option 1	3
	Option 2 - spring	6	Option 2	3
	Option 3 - spring	6	Option 3	3
	Option 4 - summer	6	Option 4	3
	Option 5 - summer	6	Option 5	3
			Option 6	3
			Option 7	3
			Option 8	3
Spring seminar	Research seminar 2	2	Research project	3
Summer seminar	Research seminar 3	2	Research methodology	3
Total credits		34		30



## 2nd year – Semester 9 (Fall Term)

## 2nd year – Semester 10 (Spring Term)

	INAOE	EC	Option MOSIG-HDWI	ECTS Credits	Option MOSIG-DSAI	ECTS Credits		INAOE	EC	Grenoble	ECTS Credits
Obligatory courses			Computer graphics	6	Knowledge rep. and reas. (can be revalidated)	6					
			Robotics (can be revalidated)	6	Large-scale data management and distributed system	6					
			Computer vision (can be revalidated)	6	Machine Learning Fundamentals (can be revalidated)	3					
					Adv. Algorithms for Machine Learning (can be revalidated)	3					
Optional courses	Option 1	6	Option 1	6	(		Spring project	Thesis 2	20	Research project	30
	Option 2	6	Option 2	6			Summer project	Thesis 3	10		
Research Project (Thesis)	Thesis 1	18									
Total credits		30		30			Total credits		30		30



- Machine learning II
- Computational intelligence II
- Multi-agent systems
- Probabilistic graphical models
- Text mining
- Information retrieval
- Language technologies
- Advanced topics in bio signals and medical applications II



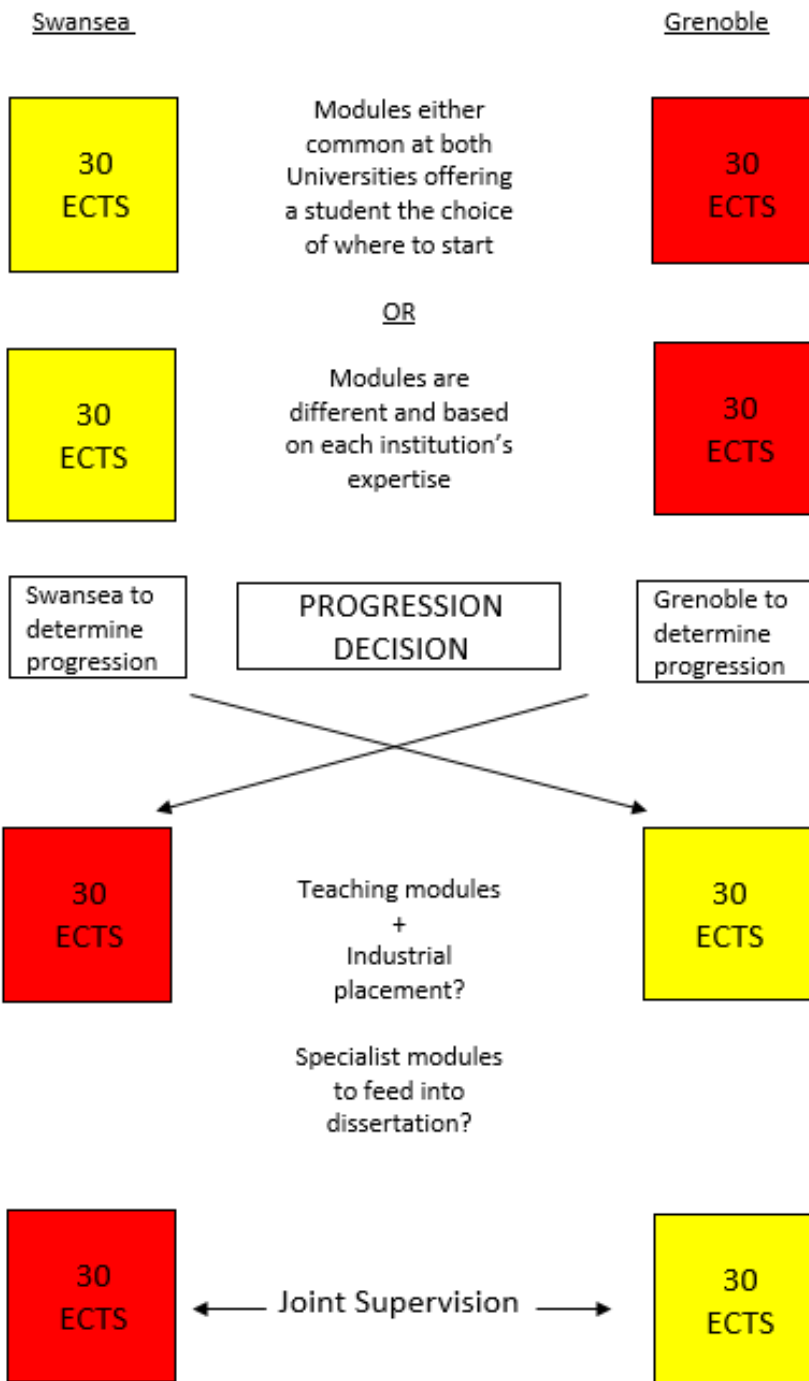
- 2 years duration programs (French legislation)
- 120 ECTS so 240 credits at Swansea
- Student shall pay fees to both universities : UGA : 450€ + SU 2017/18  
Tuition Fees - 120 ECTS :  
£4350 Home/ EU students  
£10,350 International students
- IELTS 6,5



# Swansea University



Swansea University  
Prifysgol Abertawe



<u>Mobility plan</u>			
Semesters	At UGA	At Swansea University	Comments
<b>S7 &amp; S8</b>	<p>Students from UGA or SU may choose to spend the 1<sup>st</sup> year of the program at SU or UGA (120 SU or 60 ECTS)</p> <ul style="list-style-type: none"> <li>• <a href="#"><u>Students from UGA studying in Grenoble may choose to follow the 1<sup>st</sup> year in master in Informatics OR in master 1 MOSIG</u></a></li> <li>• <a href="#"><u>Students from SU studying in Grenoble shall follow the 1<sup>st</sup> year of the master MOSIG</u></a></li> </ul>		Success in the Master 1 in the partner university is a pre requisite for entering the second year at the Partner university.
<b>S9 &amp; S10</b>	Students will have to choose between the following tracks : ORCO, MOSIG or Cybersecurity	Students will have to choose between the following tracks : Theory and Foundations; Mobile Systems; Big Data, Graphics Visualization; Software Technology	60 ECTS or 120 SU





- CSGM03 Web services (sem 2)
- CSGM04 Mobile Application Development (sem )
- CSGM05 Directed studies in logic and computation (sem 2)
- CSCM13 Critical systems (sem 3)
- CSCM18 IT security (sem 2)
- CSCM27 Visual analytics (sem 3)
- CSCM30 Research methods and seminars for data science (sem 2)
- CSCM35 Big data and data mining (sem 1)
- CSCM37 Data visualization (sem 2)
- CSCM39 Human Computer Interaction (sem 2)
- CSCM45 Big data and machine learning (sem 2)
- CSCM48 Web applications development (sem 1)
- CSCM58 High performance computing in C/C++ (sem 1)
- CSCM64 Software testing (sem 2)
- CSCM67 Graphics processor programming (sem 2)
- CSCM68 Embedded systems design (sem 1)
- CSCM70 Mathematical skills for data scientists (sem 1)
- CSCM77 Computer vision and pattern recognition (sem 1)
- CSCM75 Logic in computer science (sem 1)
- CSCM79 Hardware and devices (sem 2)
- CSCM85 Modelling and verification techniques (sem 2)
- CSCM98 Operating systems and architectures (sem 1)

- Apply now for DD with Tsukuba : dead line Nov 14th
- Apply in February for INAOE and Swansea