UNIVERSITÉ TOULOUSE III PAUL SABATIER

Faculté Sciences et Ingénierie

PÉRIODE D'ACCRÉDITATION : 2022 / 2026

UNIVERSITÉ PAUL SABATIER

SYLLABUS MASTER

Mention Informatique

M1 Computer Science for Aerospace

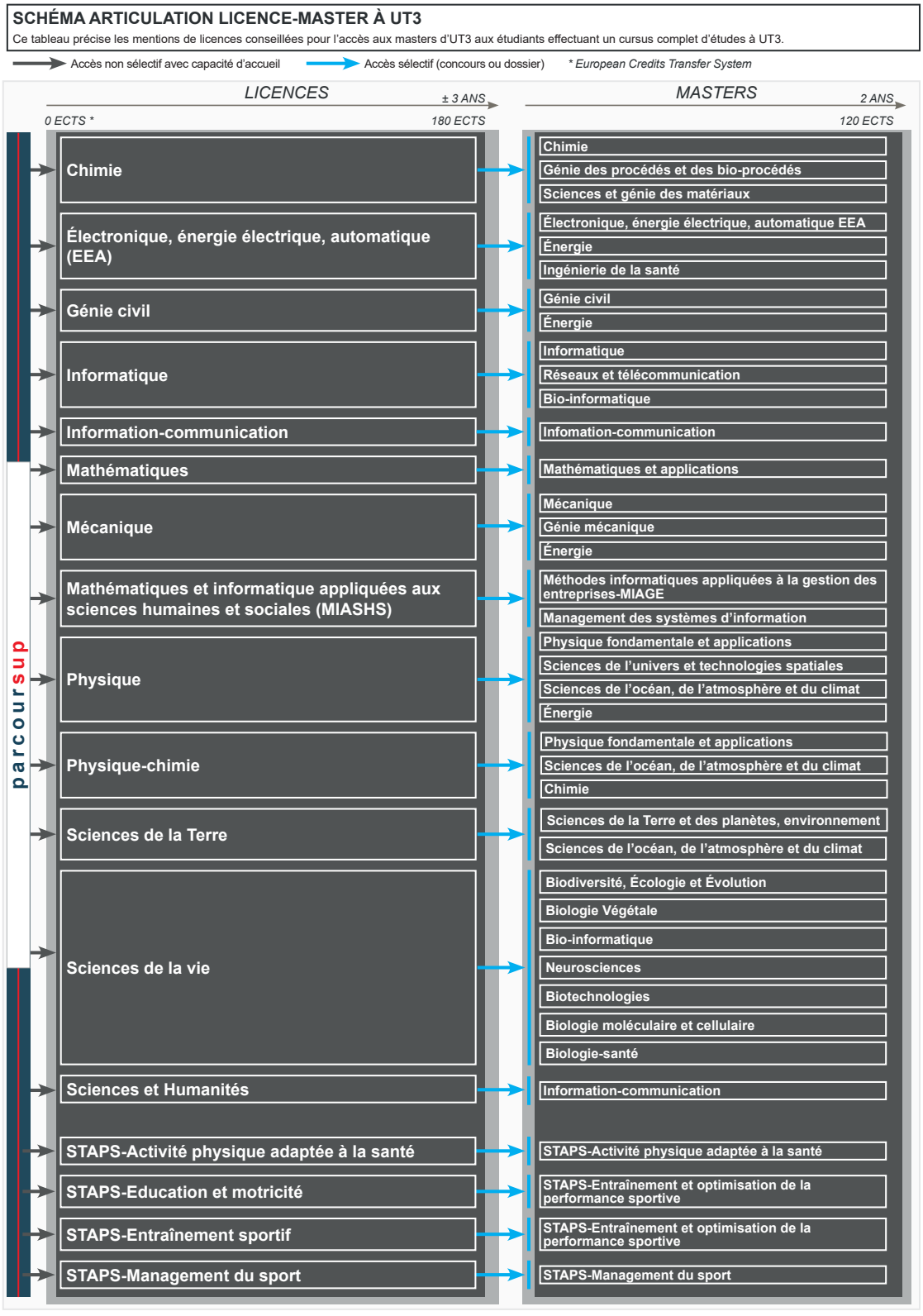
http://www.fsi.univ-tlse3.fr/
https://departement-informatique.univ-tlse3.fr/master/master-informatique-2021-2026/

2023 / 2024

29 MARS 2024

SUMMARY OF THE CONTENT

DIAGRAM OF LINKS BETWEEN BACHELOR AND MASTER DEGREES



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Sources : Arrêté d'accréditation UT3 du 31 aout 2021 et Arrêté du 31 mai 2021 modifiant l'arrêté du 6 juillet 2017 fixant la liste des compatibilités des mentions du diplôme national de licence avec les mentions du diplôme national de master. https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000043679251 et arrêté d'accréditation UT3

PRESENTATION

PRESENTATION OF THE DISCIPLINE

DISCIPLINE INFORMATIQUE

Computer science is nowaday at the core of many societal, industrial and scientific domains. The aim of the computer science master program at the university Paul Sabatier is to give student a in-depth expertise in several domain of computer science.
In the first year of this master, a set of common skills is delivered as the basis for a progressive specialization.
In the second year of this master, strong specialization year, theoretical and technological high-level training is offered to students, allowing them to access the many opportunities in the computer science industry but also to continue their doctoral studies.
The computer science master program is declined around the following thematic areas :
- Information processing and infrastructure
- Software engineering as a set of concepts, methods and development tools.
- Manipulation of content from different points of view : analysis / synthesis of information, structuring and retrievial of information, integrating the problem of massive data.
- Representation and processing of knowledge in artificial intelligence, with links toward robotic.
- Man machine interaction, with ergonomic and cognitive constraints relating thereto.

PRESENTATION OF THE YEAR OF M1 COMPUTER SCIENCE FOR AEROSPACE

CONTACTS SECTION

CONTACT INFORMATION CONCERNING THE SPECIALTY

PERSON IN CHARGE OF TEACHING AFFAIRS OF M1 COMPUTER SCIENCE FOR AEROSPACE

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SECRETARY OF STUDENT AFFAIRS OF

DOSSANT Sabine
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CONTACT INFORMATION CONCERNING THE DISCIPLINE

PERSON IN CHARGE OF THE DISCIPLINE INFORMATIQUE

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CONTACT INFORMATION FOR THE DEPARTMENT : FSI.INFO

HEAD OF DEPARTMENT

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TABLE SUMMARIZING THE MODULES THAT MAKE UP THE TRAINING PROGRAM

page	Code	Title of the module	semestre*	ECTS	Mandatory Optional	Cours	Master Class	Cours-TD	TD	TP	Projet	Stage
First semester												
10	KINR7AAU	MODELING, DESIGN, COLLABORATIVE DEVELOPMENT	I	6	O							
	KINX7AA1	Modélisation, Conception, Développement Collaboratif				22			18	14		
	KINX7AA2	Modélisation, Conception, Développement Collaboratif - mc (MCDC)					3					
11	KINR7ABU	LANGUAGE THEORY	I	6	O							
	KINX7AB1	Théorie des langages (TL)				22			14	18		
	KINX7AB2	Théorie des langages - mc (TL)					3					
13	KINR7ACU	ADVANCED ALGORITHMIC	I	6	O							
	KINX7AC1	Algorithmique avancée (AA)				20			24	10		
	KINX7AC2	Algorithmique avancée - mc (AA)					3					
14	KINR7ADU	PARALLELISM	I	6	O							
	KINX7AD1	Parallélisme (PARA)				18			20	16		
	KINX7AD2	Parallélisme - mc (PARA)					3					
15	KINR7AEU	BUSINESS IN MULTICULTURAL ENVIRONMENT	I	3	O				24			
Choose 1 module among the following 3 modules :												
16	KINR7AVU	ANGLAIS (ANG)	I	3	O				24			
17	KINR7AYU	FRANCAIS GRANDS DEBUTANTS (Fr-GDeb)	I	3	O				24			
18	KINR7AZU	FRANCAIS LANGUE ETRANGERE (FSI.Groupe-Langues)	I	3	O				24			
	KINR7FRU	REVIEW	I	0	F			24				
Second semester												
19	KINR8AAU	SOFTWARE TOOLS - RESEARCH INITIATION	II	6	O							
	KINX8AA1	Travaux d'initiation à la recherche (TIR)				6						
20	KINX8AA2	Projet				8			24			
	KINX8AA4	Projet					2					

* **AN** :year long teaching, **I** : first semester, **II** : second semester

page	Code Title of the module	semestre*	ECTS	Mandatory Optional	Cours	Master Class	Cours-TD	TD	TP	Projet	Stage
	KINX8AA3 Projet - proj									50	
	KINR8ABU INTERNSHIP / RESEARCH PROJECT	II	6	O							
	Choose 1 module among the following 2 modules :										
21	KINX8AB1 Stage										3
22	KINX8AB2 Travaux d'étude et de recherche									150	
23	KINR8ACU SECURITY	II	3	O	12			4	8	12,5	
24	KINR8ADU GEODATA	II	3	O				24			
25	KINR8AEU INTRODUCTION TO EMBEDDED SYSTEMS	II	6	O	16	3		18	18		
26	KINR8AFU RESOURCE MANAGEMENT FOR EMBEDDED SYSTEMS	II	6	O	11	3		15	22		
27	KINR8FZU FRANCAIS LANGUE ETRANGERE (FSI.LVG-Langues)	II	0	F				24			

* **AN** :year long teaching, **I** : first semester, **II** : second semester

LIST OF THE MODULES

UE	MODELING, DESIGN, COLLABORATIVE DEVELOPMENT	6 ECTS	1st semester
Sous UE	Modélisation, Conception, Développement Collaboratif		
KINX7AA1	Cours : 22h , TD : 18h , TP : 14h	Teaching in anglais	Personal work 93 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

MIGEON Frédéric
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UE	LANGUAGE THEORY	6 ECTS	1st semester
Sous UE	Théorie des langages (TL)		
KINX7AB1	Cours : 22h , TD : 14h , TP : 18h	Teaching in anglais	Personal work 93 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

CASSE Hugues
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LEARNING GOALS

This course aims : (a) to understand the work of code source parser and the production of intermediate code (front-end) and (b) to exploit this representation to generate and optimize executable code (back-end). During this process, this course shows how to apply verification strategies in order to ensure the soundness of the compiler.

SUMMARY OF THE CONTENT

Compilation de langage impératif
* Exécution et compilation
* Analyse syntaxique
* Génération de code
Vérification
* Preuve assistée
* Modélisation d'AST typés
* Sémantique de langages
* Transformations vérifiées
Compilation d'une requête en langage déclaratif
* Introduction et motivations
* Optimisation de code
* Génération de code
Les TPs consistent en la mise en oeuvre d'un mini-projet permettant de réaliser un compilateur composé d'un analyseur pour un langage de programmation réel exécuté par une machine virtuelle. La première partie va consister à réaliser un mini-compilateur de l'analyse du source à la génération du code : analyse lexicale, analyse syntaxique, construction des arbres de syntaxe abstrait et génération de code. En seconde partie, des optimisations vérifiées seront réalisées sur la représentation intermédiaire. L'environnement de preuve interactive utilisé pour cela (Coq) est d'abord présenté avec un rappel des notions sous-jacentes, puis un ensemble d'exemples de sémantiques de langages de programmation est formalisé, avant de modéliser et vérifier une transformation agissant sur la représentation intermédiaire.

PREREQUISITES

basics of language theory, finite automata, functional programming (OCaml)
introduction to interactive theorem proving (Coq), knowledge in relational databases

TARGETED SKILLS

— setting up a code source parser,
— developing a verified translator applied on the program intermediate representation,
— generating optimized code translating requests from declarative languages.

REFERENCES

A. Aho at al. Compilers : principles, techniques and tools. Pearson Education.
Y. Bertot. Coq in a Hurry. Types Summer School, Nice, EJCP, 2016.
M. Bouzeghoub et al. Sys. de BD : des tech. d'implantation à la conception de schémas. Eyrolles.

KEYWORDS

Compilation, translation, optimization, code generation, syntactic analysis, intermediate representation, semantics, assisted proof, verified transformation.

UE	ADVANCED ALGORITHMIC	6 ECTS	1st semester
Sous UE	Algorithmique avancée (AA)		
KINX7AC1	Cours : 20h , TD : 24h , TP : 10h	Teaching in anglais	Personal work 93 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

MENGIN Jérôme
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LEARNING GOALS

After a reminder about algorithmic complexity, illustrated on operations for advanced data structures, this module presents the main methods and algorithms for modelling and solve decision and combinatorial and / or linear optimisation problems. After validating this module, students will be able to :

- Recognise hard combinatorial optimisation problems
- Model as maximum flow problem, as linear programs (with or without integer variables), as constraint satisfaction problems
- Choose, and efficiently use, appropriate problem solving tool
- Implement operations on search tree and heaps, and exact and incomplete algorithms for solving combinatorial optimisation problems, and analyse their complexity

SUMMARY OF THE CONTENT

1. Algorithmic complity, operations on advanced data structures (heap, search tree) : Flow network, without / with costs, Maximum flow solution
2. Linear programming : Formalism, graphical solution, dual problem
3. Classical hard combinatorial optimisation problems : Set partitioning, scheduling, routing, ...
4. Approximate algorithms, approximation ratio
5. SAT, DPLL method
6. Complexity classes : Class NP, reductions, NP-completeness, approximation classes
7. Generic formalisms and exhaustive search : constraint satisfaction problems, backtrack, heuristics, forward checking ; MILP, relaxation ; Modelling
8. Incomplete methods : Principles of local search / population methods ; metaheuristics (tabu search)

For each type of optimisation or decision problem covered, we study the complexity of algorithms and modelling techniquesLab sessions : implementation of a backtrack search algorithm, implementation of local search algorithms, efficient use of MILP / CSP solving tools

PREREQUISITES

Graphs, Data Structures, Algorithmic complexity

REFERENCES

- Introduction to Algorithms. T. Cormen, C. Leiserson, R. and C. Stein. MIT Press, 2009
- Algorithms. S Dasgupta, C.H. Papadimitriou, U.V. Vazirani. McGraw Hill, 2006

KEYWORDS

Flow networks, Linear programming, combinatorial optimisation, SAT, CSP, complexity classes, metaheuristics

UE	PARALLELISM	6 ECTS	1st semester
Sous UE	Parallélisme (PARA)		
KINX7AD1	Cours : 18h , TD : 20h , TP : 16h	Teaching in anglais	Personal work 93 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

DA COSTA Georges
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LEARNING GOALS

The objective of this teaching module is to introduce the foundations of parallelism on distributed or massively parallel architectures (GPU) :

- models of parallelism (synchronous/asynchronous)
- abstraction of parallel algorithms (Petri nets)
- concepts of cooperation and synchronization
- models for achieving efficient parallelism (MPI, Cuda)

At the end of this course, the student will be able to design, analyze and evaluate parallel algorithms. The study of the MPI and Cuda approaches and APIs will enable the student to solve problems using efficient parallel algorithms. The presentation of "conditions" will complete the student's training in the synchronization of parallel activities.

SUMMARY OF THE CONTENT

The pedagogy will be based on several practical exercices (TD and TP) to integrate the particularities of parallelism.

Parallelism/synchronization

- Hoare monitors, conditions
- Petri nets

MPI model

- model and primitives
- parallelization and implementation of algorithms

Cuda model

- programming model and API
- execution model, memories and optimization
- applications, libraries and tools

Master Class

PREREQUISITES

Advanced algorithms, concurrent programming, processes, threads, shared variables, computer architecture, networking, problem abstraction

REFERENCES

- Fundamentals of Parallel Multicore Architecture, Chapman and Hall/CRC, Y. Solihin
- Principles of Concurrent and Distributed Programming, Addison-Wesley.
- Communication and Concurrency, Prentice Hall Int. Series in Computer Science, R. Milner.

KEYWORDS

Parallel architectures, Parallel models, Distributed models, Data consistency, Synchronization expressions and conditions, MPI, CUDA

UE	BUSINESS IN MULTICULTURAL ENVIRONMENT	3 ECTS	1st semester
KINR7AEU	TD : 24h	Teaching in anglais	Personal work 51 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

MOTTAY Didier
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UE	ANGLAIS (ANG)	3 ECTS	1st semester
KINR7AVU	TD : 24h	Teaching in anglais	Personal work 51 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

CHAPLIER Claire
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LEARNING GOALS

Permettre aux étudiants de développer les compétences indispensables à la réussite dans leur future vie professionnelle en contextes culturels variés.=12.0ptA=12.0ptcqu=12.0ptérir l'autonomie linguistique nécessaire et de perfectionner les outils de langue spécialisée permettant l'intégration professionnelle et la communication d'une expertise scientifique dans le contexte international
=12.0ptNiveau C1 du CECRL (Cadre Européen Commun de Référence pour les Langues)

SUMMARY OF THE CONTENT

Développer :- les compétences liées à la compréhension de publications scientifiques ou professionnelles rédigées en anglais ainsi que les compétences nécessaires à la compréhension de communications scientifiques orales.- les outils d'expression permettant de maîtriser une présentation orale et/ou écrite et d'aborder une discussion critique dans le domaine scientifique (ex. rhétorique) .- la maîtrise des éléments d'argumentation critique à l'oral et/ou à l'écrit d'une publication scientifique=12.0ptune réflexion plus large sur leur place, leur intégration et leur rayonnement en tant que scientifiques dans la société, abordant des questions d'actualité, d'éthique, d'intégrité

PREREQUISITES

Niveau B2 du CECR(Cadre Européen Commun de Référence pour les Langues)

TARGETED SKILLS

S'exprimer avec aisance à l'oral, devant un public, en usant de registres adaptés aux différents contextes et aux différents interlocuteurs.=12.0ptSe servir aisément d'une langue vivante autre que le français : compréhension et expression écrites et orales :
- Comprendre un article scientifique ou professionnel rédigé en anglais sur un sujet relatif à leur domaine.
- Produire un écrit scientifique ou technique dans un anglais adapté, de qualité et respectant les normes et usages de la communauté scientifique anglophone.
-Interagir à l'oral en anglais : réussir ses échanges formels et informels lors des colloques, réunions ou entretiens professionnels

KEYWORDS

Projet Anglais scientifique Rédaction Publication Communication esprit critique scientifique interculturel

UE	FRANCAIS GRANDS DEBUTANTS (Fr-GDeb)	3 ECTS	1st semester
KINR7AYU	TD : 24h	Teaching in anglais	Personal work 51 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

DULAC Céline
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GOFFINET Akissi
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LEARNING GOALS

acquérir les compétences de base afin de pouvoir s'insérer plus facilement dans la vie quotidienne à Toulouse

SUMMARY OF THE CONTENT

- compréhension et expression orales du français général de niveau A1
- acquisition de vocabulaire et de structures de niveau A1
- éléments de prononciation et de prosodie du français
- réflexion sur les différences interculturelles

PREREQUISITES

No prior knowledge in French. / Aucune connaissance préalable du français.

SPECIFICITIES

Ce cours est accessible uniquement aux étudiant-e-s des masters dispensés entièrement en anglais, à condition qu'ils-elles n'aient pas de connaissance préalable du français.

TARGETED SKILLS

- acquérir des compétences en expression et compréhension orales
- communiquer dans le cadre des tâches liées à la vie quotidienne
- exprimer son opinion sur des sujets simples
- acquérir certaines des connaissances lexicales et grammaticales du niveau A1

REFERENCES

Communiqués par l'enseignant-e en début de semestre.

KEYWORDS

Français Langue Etrangère, Insertion, Interculturalité

UE	FRANCAIS LANGUE ETRANGERE (FSI.Groupe-Langues)	3 ECTS	1st semester
KINR7AZU	TD : 24h	Teaching in anglais	Personal work 51 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

DULAC Céline
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LEARNING GOALS

Développer ses compétences langagières et interculturelles en français durant un séjour d'études en France.

SUMMARY OF THE CONTENT

- compréhension et expression orales du français général de niveau A1/A2, B1 ou B2+ selon le cours suivi
- acquisition de vocabulaire et de structures de niveau A1/A2, B1 ou B2+ selon le cours suivi
- éléments de prononciation et de prosodie du français
- réflexion sur les différences interculturelles

PREREQUISITES

Passation du test ELAO. L'étudiant-e suit le cours de son niveau (A1/A2, B1 ou B2).

SPECIFICITIES

Ce cours est accessible uniquement aux étudiant-e-s étrangers-ères non francophones et en échange à l'UT3.

TARGETED SKILLS

Les compétences visées dépendent du niveau CECRL de l'étudiant-e ; chaque cours est adapté en fonction des descriptifs du CECRL.

KEYWORDS

Français Langue Etrangère, Insertion, Interculturalité

UE	SOFTWARE TOOLS - RESEARCH INITIATION	6 ECTS	2nd semester
Sous UE	Travaux d'initiation à la recherche (TIR)		
KINX8AA1	Cours : 6h	Teaching in anglais	Personal work 110 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

MORENO José
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UE	SOFTWARE TOOLS - RESEARCH INITIATION	6 ECTS	2nd semester
Sous UE	Projet		
KINX8AA2	Cours : 8h , TD : 24h	Teaching in anglais	Personal work 110 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

MIGEON Frédéric
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UE	INTERNSHIP / RESEARCH PROJECT	6 ECTS	2nd semester
Sous UE	Stage		
KINX8AB1	Stage : 3 mois minimum	Teaching in anglais	Personal work 150 h

[Retour liste de UE]

LEARNING GOALS

L'objectif de ce stage est de mettre en application tous les concepts étudiés en formation, de les mettre en œuvre sur les technologies utilisées par l'entreprise (parfois nouvelles) et de s'adapter au fonctionnement de l'entreprise.
Compétence(s) attestées(s) après validation du module :
- Mettre en œuvre les connaissances et compétences acquises au cours de la formation pour répondre à différentes missions dans un contexte applicatif industriel ou recherche.
- S'adapter à un nouvel environnement de travail Connaissances acquises(s) après validation du module : répondre à des objectifs tracés en s'appuyant sur des outils liés en l'ensemble des compétences de la formation (informatique décisionnelle, base de données, statistique, machine learning, gestion de projet)

SUMMARY OF THE CONTENT

Missions dans un contexte applicatif industriel ou recherche.

PREREQUISITES

Ensemble de compétences mathématiques et informatiques acquises jusqu'en M1 dépendant du contexte applicatif.

REFERENCES

N/A

KEYWORDS

Mission, cadre applicatif, industrie, recherche

UE	INTERNSHIP / RESEARCH PROJECT	6 ECTS	2nd semester
Sous UE	Travaux d'étude et de recherche		
KINX8AB2	Projet : 150h	Teaching in anglais	Personal work 150 h

[Retour liste de UE]

UE	SECURITY	3 ECTS	2nd semester
KINR8ACU	Cours : 12h , TD : 4h , TP : 8h , Projet : 12,5h	Teaching in anglais	Personal work 51 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

CHEVALIER Yannick
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UE	GEODATA	3 ECTS	2nd semester
KINR8ADU	TD : 24h	Teaching in anglais	Personal work 51 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

SEDES Florence
Email : sedes@irit.fr

UE	INTRODUCTION TO EMBEDDED SYSTEMS	6 ECTS	2nd semester
KINR8AEU	Cours : 16h , TD : 18h , TP : 18h , Master Class : 3h	Teaching in anglais	Personal work 95 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

OBER Ileana
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LEARNING GOALS

The goal is to familiarize the students with the notion of *system,* both specific and abstract, by using application the systems that built by scientists : the embedded systems. This course will be structured along two main axes :
- an axis that focuses on the *software* part covering mainly the modeling and upstream verification of on-board systems
- an axis which focuses on the *hardware* part covering the design and development of on-board systems.The first axis targets the understanding of constraints specific to the development of embedded software and the use of modeling and software development environments dedicated to real-time and embedded systems. Thesecond axis provides an understanding of the operation and constraints induced by the equipmen, tto control it effectively.

SUMMARY OF THE CONTENT

Software-focused part :• Study various behavior modeling techniques• Analysis of the characteristics of a real-time system from a case study• Functional and non-functional requirements, programming languages and concepts, synchronous and asynchronous execution models, need for validation and verification• Introduction to asynchronous specification formalisms• Practical work on asynchronous modeling and validation with IBM Rhapsody• Model-checking theory : transition system, Kripke structure, Büchi automata, linear temporal logic, graph algorithms.• Practical work on model checking with the SPIN tool.Hardware-focused part :• micro-controller and multi-core• scan and interrupt (PIO)• Timer programming• sensor and ADC• actuator and PWM• Practicals carried out on STM32 card + sensors / actuators

PREREQUISITES

Programming basics (in C), propositional logic, basic notions for modeling in logicMachine architecture

REFERENCES

H. Gomaa Software Modeling and Design. UML. and Software Architectures. Cambridge UP 2011
J. Hennessy, D.-A. Patterson. *Computer Architecture A Quantitative.* Morgan Kaufmann
S. Merz. An Introduction to Model Checking. ISTE Publishing 2008

KEYWORDS

Execution models, model checking, simulation, architecture, microcontroller, sensor, actuator, input-output.

UE	RESOURCE MANAGEMENT FOR EMBEDDED SYSTEMS	6 ECTS	2nd semester
KINR8AFU	Cours : 11h , TD : 15h , TP : 22h , Master Class : 3h	Teaching in anglais	Personal work 99 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

DA COSTA Georges
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LEARNING GOALS

This course focuses on resource management issues in constrained environments. In this course, resources must be understood as processors, memory, disk, network but also power, energy or time. In an embedded systems environment, the amount of these resources is clearly limited and must be controlled appropriately, in particular with global views and not only local ones (fair sharing, hungerless,). Depending on the system constraints and on the available information (perfect view or no knowledge of the future) different performances and guarantees are reachable and will be evaluated.
Skills : Design and evaluation of resource management systems
Knowledge : Scheduling algorithms ; Worst-Case Execution time analysis techniques

SUMMARY OF THE CONTENT

On-line methods
- Introduction to (scarce) resource management
- On-line Scheduling with multiple resources
- Multi-objective (performance and energy) optimization (greedy with comparison with linear programming based optimal solution)
- Practical sessions with a synthetic multi-core simulator

Static methods
- Worst-Case Execution Time analysis
- Static scheduling and implementation

System evaluation using static and on-line methods
- Practical session using a simplified multi-threading system

PREREQUISITES

- Computer architecture : processor, bus, memory, assembly programming, architectures for embedded systems ; O/S : distributed system
- Operational Research

REFERENCES

- https ://pypi.org/project/PuLP/ Linear Programming modeler writer in python
- Distributed systems : Principles and Paradigms, Andrew Tanenbaum
- Real Time Systems and Programming languages, A. Burns and A. Wellings

KEYWORDS

Resources management, load balancing, power consumption, Worst-Case Execution Time

UE	FRANCAIS LANGUE ETRANGERE (FSI.LVG-Langues)	ECTS	2nd semester
KINR8FZU	TD : 24h	Teaching in anglais	Personal work 24 h

[Retour liste de UE]

TEACHER IN CHARGE OF THE MODULE

DULAC Céline
Email : celine.dulac@univ-tlse3.fr

LEARNING GOALS

Développer ses compétences langagières et interculturelles en français durant un séjour d'études en France.

SUMMARY OF THE CONTENT

- compréhension et expression orales du français général de niveau A1/A2, B1 ou B2+ selon le cours suivi
- acquisition de vocabulaire et de structures de niveau A1/A2, B1 ou B2+ selon le cours suivi
- éléments de prononciation et de prosodie du français
- réflexion sur les différences interculturelles

PREREQUISITES

Passation du test ELAO. L'étudiant-e suit le cours de son niveau (A1/A2, B1 ou B2).

SPECIFICITIES

Ce cours est accessible uniquement aux étudiant-e-s étrangers-ères non francophones et en échange à l'UT3.

TARGETED SKILLS

Les compétences visées dépendent du niveau CECRL de l'étudiant-e ; chaque cours est adapté en fonction des descriptifs du CECRL.

KEYWORDS

Français Langue Etrangère, Insertion, Interculturalité

GLOSSARY

GENERAL TERMS

DEPARTMENT

The departments are teaching structures within components (or faculties). They group together teachers lecturing in one or more disciplines.

MODULE

A semester is structured into modules that may be mandatory, elective (when there is a choice) or optional (extra). A module corresponds to a coherent teaching unit whose sucessful completion leads to the award of ECTS credits.

ECTS: EUROPEAN CREDITS TRANSFER SYSTEM

The ECTS is a common unit of measure of undergraduate and postgraduate university courses within Europe, created in 1989. Each validated module is thus assigned a certain number of of ECTS (30 per teaching semester). The number of ECTS depends on the total workload (lectures, tutorials, practicals, etc.) including individual work. The ECTS system aims to facilitate student mobility as well as the recognition of degrees throughout Europe.

TERMS ASSOCIATED WITH DEGREES

Degrees have associated domains, disciplines and specialities.

DOMAIN

The domain corresponds to a set of degrees from the same scientific or professional field. Most of our degrees correspond to the domain Science, Technology and Health.

DISCIPLINE

The discipline corresponds to a branch of knowledge. Most of the time a discipline consists of several specialities.

SPECIALITY

The speciality constitutes a particular thematic orientation of a discipline chosen by a student and organised as a specific trajectory with specialised modules.

TERMS ASSOCIATED WITH TEACHING

LECTURES

Lectures given to a large group of students (for instance all students of the same year group) in lecture theatres. Apart from the presence of a large number of students, lectures are characterized by the fact they are given by a teacher who defines the structure and the teaching method. Although its content is the result of a collaboration between the teacher and the rest of the educational team, each lecture reflects the view of the teacher giving it.

TD : TUTORIALS

Tutorials are work sessions in smaller groups (from 25 to 40 students depending on the department) led by a teacher. They illustrate the lectures and allow students to explore the topics deeper.

TP : PRACTICALS

Teaching methods allowing the students to acquire hands-on experience concerning the knowledge learned during lectures and tutorials, achieved through experiments. Practical classes are composed of 16 to 20 students. Some practicals may be partially supervised or unsupervised. On the other hand, certain practicals, for safety reasons, need to be closely supervised (up to one teacher for four students).

PROJECT

A project involves putting into practice in an autonomous or semi-autonomous way knowledge acquired by the student at the university. It allows the verification of the acquisition of competences.

FIELD CLASS

Field classes are a supervised teaching method consisting of putting into practice knowledge acquired outside of the university.

INTERNSHIPS

Internships are opportunities enabling students to enrich their education with hands-on experience and to apply lessons learned in the classroom to professional settings, either in industry or in research laboratories. Internships are strongly regulated and the law requires, in particular, a formal internship convention established between the student, the hosting structure and the university.

UNIVERSITÉ
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