Study Plan

School: School of Sciences and Technology
Degree: Master
Course: Informatics Engineering (E-Learning) (cód. 578)

1st Year - 1st Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
INF07192M	Applied Artificial Intelligence	Informatics	6	Semester	157
INF07193M	Computer-Based Decision Support Systems	Informatics	6	Semester	157
INF07194M	Advanced Topics in Compilation	Informatics	6	Semester	157
INF07195M	Advanced Topics in Distributed Systems	Informatics	6	Semester	157

1st Year - 1st Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours

Group of Options

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
INF07033M	Text Based Information Retrieval	Informatics	6	Semester	157
INF07191M	Multimodal Systems	Informatics	6	Semester	157
GES07014M	Information Systems Management	Management	6	Semester	161
MAT07177M	Cryptography	Informatics	6	Semester	157
INF07173M	advanced Topics in Digital Processing	Informatics	6	Semester	157
INF07176M	Location Based Services	Informatics	6	Semester	157
INF07190M	Embedded Systems	Informatics	6	Semester	157
INF07171M	Declarative Languages Implementation	Informatics	6	Semester	157
INF07179M	Distributed Informatiom Systems / System Interoperability and Integration	Informatics	6	Semester	157
INF07017M	Data Warehouse	Informatics	6	Semester	157
INF07187M	Natural Language Processing Systems	Informatics	6	Semester	157
INF07170M	Machine Learning	Informatics	6	Semester	157
INF07174M	Ubiquitous Computing	Informatics	6	Semester	157
INF07175M	Game Design	Informatics	6	Semester	157
INF07178M	Declarative Information Systems	Informatics	6	Semester	157
INF07185M	Data Mining	Informatics	6	Semester	157
INF07186M	Computer-Based Decision and Control Systems	Informatics	6	Semester	157
INF07172M	Reasoning and Knowledge Representation	Informatics	6	Semester	157
INF07181M	Multimedia Information System	Informatics	6	Semester	157
INF07180M	Software Engineering	Informatics	6	Semester	157
INF07188M	Digital Signals Processing	Informatics	6	Semester	157

1st Year - 2nd Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
INF07183M	Human-Machine interfaces	Informatics	6	Semester	157
GES07182M	Project Management	Management	6	Semester	157
INF07184M	Advanced topics in Databases	Informatics	6	Semester	157

1st Year - 2nd Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours

Group of Options

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INF07033M	Text Based Information Retrieval	Informatics	6	Semester	157
INF07176M	Location Based Services	Informatics	6	Semester	157
INF07190M	Embedded Systems	Informatics	6	Semester	157
INF07171M	Declarative Languages Implementation	Informatics	6	Semester	157
INF07179M	Distributed Informatiom Systems / System Interoperability and Integration	Informatics	6	Semester	157
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INF07187M	Natural Language Processing Systems	Informatics	6	Semester	157
INF07170M	Machine Learning	Informatics	6	Semester	157
INF07174M	Ubiquitous Computing	Informatics	6	Semester	157
INF07175M	Game Design	Informatics	6	Semester	157
INF07178M	Declarative Information Systems	Informatics	6	Semester	157
INF07185M	Data Mining	Informatics	6	Semester	157
INF07186M	Computer-Based Decision and Control Systems	Informatics	6	Semester	157
MAT07177M	Cryptography	Informatics	6	Semester	157
INF07173M	advanced Topics in Digital Processing	Informatics	6	Semester	157
GES07014M	Information Systems Management	Management	6	Semester	161
INF07191M	Multimodal Systems	Informatics	6	Semester	157
INF07172M	Reasoning and Knowledge Representation	Informatics	6	Semester	157
INF07181M	Multimedia Information System	Informatics	6	Semester	157
INF07180M	Software Engineering	Informatics	6	Semester	157
INF07188M	Digital Signals Processing	Informatics	6	Semester	157

2nd Year - 3rd Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours

Group of Options

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
INF07033M	Text Based Information Retrieval	Informatics	6	Semester	157
INF07172M	Reasoning and Knowledge Representation	Informatics	6	Semester	157
MAT07177M	Cryptography	Informatics	6	Semester	157
INF07191M	Multimodal Systems	Informatics	6	Semester	157
INF07173M	advanced Topics in Digital Processing	Informatics	6	Semester	157
INF07176M	Location Based Services	Informatics	6	Semester	157
INF07190M	Embedded Systems	Informatics	6	Semester	157
INF07171M	Declarative Languages Implementation	Informatics	6	Semester	157
INF07179M	Distributed Informatiom Systems / System Interoperability and Integration	Informatics	6	Semester	157
INF07017M	Data Warehouse	Informatics	6	Semester	157
INF07187M	Natural Language Processing Systems	Informatics	6	Semester	157
GES07014M	Information Systems Management	Management	6	Semester	161
INF07170M	Machine Learning	Informatics	6	Semester	157
INF07174M	Ubiquitous Computing	Informatics	6	Semester	157
INF07175M	Game Design	Informatics	6	Semester	157
INF07178M	Declarative Information Systems	Informatics	6	Semester	157
INF07185M	Data Mining	Informatics	6	Semester	157
INF07186M	Computer-Based Decision and Control Systems	Informatics	6	Semester	157
INF07181M	Multimedia Information System	Informatics	6	Semester	157
INF07180M	Software Engineering	Informatics	6	Semester	157
INF07188M	Digital Signals Processing	Informatics	6	Semester	157

INF07189M	Seminars	Informatics	6	Semester	157

Mandatory alternatives

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
Dissertation					
Internship					

2nd Year - 4th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours

Mandatory alternatives

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
Dissertation					
Internship					

Conditions for obtaining the Degree:

*** TRANSLATE ME: Para aprovação na componente curricular é necessário a aprovação (através de avaliação ou creditação) das seguintes unidades Curriculares:{\}newline

1º Semestre:{\}newline

4 UC obrigatórias num total de 24 Ects{\}newline

1 UC Optativa num total de 6 Ects{\}newline

2º Semestre:{\}newline

3 UC Obrigatórias num total de 18 Ects{\}newline

2 UC Optativas num total de 12 Ects{\}newline

3º Semestre:{\}newline

1 UC obrigatória num total de 6 Ects{\}newline

1 UC optativa num ttal de 6 Ects{\}newline

Para obtenção do grau é necessário também a aprovação em Dissertação, Relatório de Estágio ou Trabalho de Projecto, no total de 48 ECTS, no 3.º e 4.º Semestre. ***

Program Contents

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Applied Artificial Intelligence (INF07192M)

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Computer-Based Decision Support Systems (INF07193M)

Advanced Topics in Compilation (INF07194M)

Intermediate representation (IR)

Linear IRs
Tree IRs
Three-address code

Control flow analysis

Basic blocks
Control flow graph

Data flow analysis

Liveness analysis
Live ranges
Interference graph

Primer on the MIPS architecture
Code generation

Basic instruction selection
Measures for code cost
Tiles and tilings
Instruction selection by maximal munch
Instruction selection by dynamic programming
Tree grammars
Bottom-up rewrite systems
Instruction selection by peephole optimisation

Register allocation

For expressions
By graph colouring

Static single assignment form(SSA)

Dominator and dominance frontier
Conversion to and from SSA form

Basic code optimisation techniques

Dead- and useless-code elimination
Constant propagation
Copy propagation

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Advanced Topics in Distributed Systems (INF07195M)

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Text Based Information Retrieval (INF07033M)

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Multimodal Systems (INF07191M)

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Information Systems Management (GES07014M)

0 - Problematic, Main Goals and content of the course;{\}newline
1 - Organization, Management, system and Information, Information and Communication Technologies;{\}newline
2 - Strategy and Information Systems and Technologies (IS/IT);{\}newline
3 Information Systems Management;{\}newline
4 Investments Management on IS/IT; Knowledge Management{\}newline

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Cryptography (MAT07177M)

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advanced Topics in Digital Processing (INF07173M)

Discrete-time and continuous-time systems. Block diagram algebra. Feedback and stability of dynamical systems. Feedback control and regulation systems.
Systems described by continuous and discrete variables. Deterministic and stochastic systems (state machines and Markov models). Time response.
System identification (offline and online). Performance criteria and evaluation.
Design and simulation tools: Octave, Matlab/Simulink.
Projects: development of an applied project within the student interests including
- Modelling of a dynamical system
- Simulation
- Processing (visualization, control, prediction, or optimization of the modelled system)

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Location Based Services (INF07176M)

Introduction of concepts (ubiquitous computing, mobile computing, representation of spatial information)
Positioning technologies (RFID, Wi-Fi, GPS ,...)
Sensor networks
Background information
Geographical Information System
Design of location-based services
Applications
Prospects for future development.

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Declarative Languages Implementation (INF07171M)

1. Declarative vs. Imperative Programming Languages
2. Implementation of Logic Languages
3. Implementation of Functional Languages
4. Implementation of Object-Oriented Languages

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Distributed Informatiom Systems / System Interoperability and Integration (INF07179M)

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Data Warehouse (INF07017M)

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Natural Language Processing Systems (INF07187M)

(1) lexical analysis;
(2) Parsing: logic grammars (DCGs, XGS), tags, and HPSGs CFG.
(3) Semantic Analysis: DRT, and other semantic for natural language, compositionality.
(4) Pragmatic Analysis: Theory of speech acts , anaphora resolution, dialogue.
(5) Applications of natural language processing systems

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Machine Learning (INF07170M)

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Ubiquitous Computing (INF07174M)

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Game Design (INF07175M)

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Declarative Information Systems (INF07178M)

Heterogeneous information systems.
Middleware:
mediator languages,
logic-based models,
constraint systems,
persistence,
modularity.
Logic and object-oriented programming.
Object-relational databases.
Semantic web: XML, RDF, ontologies, OWL, query languages, SPARQL.

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Data Mining (INF07185M)

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Computer-Based Decision and Control Systems (INF07186M)

1. Closed Loop Feedback systems.
1.1. Linear discrete systems
1.2. Transforms and transfer functions
1.3. poles and zeros
1.4. closed loop systems
2. System supervision and fault detection.
2.1. Models Based
2.2. Signal Based
3. Project and simulation tools: Octave, Matlab/Simulink.
4. Implementation of and applied project.

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Reasoning and Knowledge Representation (INF07172M)

(1) Conceptual maps and semantic networks.
(2) propositional descriptive logics
(3) Formalization of Knowledge Bases
(4) Ontologies
(5) Descriptive Logic and Databases.
(6) Time and causality
(7) Semantic Web

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Software Engineering (INF07180M)

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Digital Signals Processing (INF07188M)

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Human-Machine interfaces (INF07183M)

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Project Management (GES07182M)

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Advanced topics in Databases (INF07184M)

Seminars (INF07189M)