

Master of Sciences in Computer Science Track “Optimization in Operations Research”

University of Nantes, Ecole des mines de Nantes

Year 2016-2017

Plan

- 1 Introduction
- 2 Program and courses
- 3 ORO now and in 2017-2021

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Who, what, where?

Persons in charge

- Master Computer Science:
Prof. Xavier Gandibleux (Office 121)
- Program, M2 ORO: **Dr. Anthony Przybylski** (Office 122)
- M1 ORO: **Dr. Evgeny Gurevsky and Dr. Anthony Przybylski**
- Internship: **Dr. Evgeny Gurevsky** (Office 122)
- EMN partner: **Dr. Fabien Lehuédé** (Office C018/EMN)

Secretary: ??? (Office 103)

International: **Mrs Christine Foucat** (Building 1, Bureau des Relations Internationales)

Contact by e-mail : firstname.lastname@univ-nantes.fr

Except for: fabien.lehuede@mines-nantes.fr

Website: <http://oro.univ-nantes.fr/>

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Map of the Faculty of Sciences



ID Card

- Master of Sciences in Computer Sciences
Track “Optimization on Operations Research” (ORO)
- Graduated with **Research training** or **Applied training**
- The diploma is **shared with EMN** school of engineers
- Master program based on **strong regional scientific competences in optimization**
- Academic staff from **UN-FST, EMN, CNRS, UBS, UA, ULB**
- Built on two research laboratories: **LINA and IRCCyN**
- **Bilateral international agreements** with several institutions (BE, UK, DE, JP)

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ID Card

- Structured in **2 years**, i.e. **4 semesters**, S1, S2, S3, S4
- Courses at the **Faculty of Sciences, University of Nantes** and at the **EMN**
- **Lectures in English S3**
- **Research or Applied Internship** during semester S4
- ~~Semester **S2 or S4 abroad** mandatory~~
- **Double diploma** with the Master in Computer Sciences “Optimization and Algorithms” from ULB, in case of validation of S2

“Specific” Equipment for the Master ORO

Classroom Info2 “dedicated” to the Master ORO

- TP ORO M1 and M2
- Projects (practice courses)

Environment

- Desktops under linux, laser printer
- Optimization software
- Reference books used in your courses

On the website of the University of Nantes

Unique ID and password for all services!

- Intranet: <http://www.univ-nantes.fr> and next click on “intranet” (up-right of the screen)
- Webmail: <https://webmail.etu.univ-nantes.fr>
- Madoc : <http://madoc.univ-nantes.fr>
- Official time schedule:
<https://edt.univ-nantes.fr/sciences>

Plan

- 1 Introduction
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Semester 1 in Nantes

Code	Course	Lecturer(s)	CM/TD/TP
X7IO010	Integer Programming	X. Gandibleux, E. Gurevsky	22/22/16
X7IO020	Graphs and Networks	I. Rusu	16/16/16
X7IO050	Metaheuristics	X. Gandibleux	8/8/8
X7IO060	OR Special Topic I	E. Monfroy and F. Richoux	8/8/8
X7IO070	NonLinear Optimization	G. Chabert (EMN)	8/8/8
X7IO080	Decision Engineering	E. Gurevsky	8/8/8
X7II040	Communication Skills	G. Goby	0/12/0
X7II050	Scientific English 1	A. Townend	0/36/0

Semester 2 in Nantes

Code	Course	Lecturer(s)	CM/TD/TP	ECTS
X8II030	Introduction to Research	-	-	5
X8II031	Research methodology	E. Monfroy	12/0/0	-
X8II032	Research project	-	-	-
X8II040	Entrepreneurship	S. Berger	0/12/0	1

Options (must reach 24 ECTS)

X8II050	Scientific English 2	A. Townend	0/36/0	3
X8II060	Constraint Programming	L. Granvilliers	8/8/8	3
X8II070	Multicore Programming	F. Goualard	8/8/8	3
X8II090	Machine learning	C. Higuera	24/18/06	6
X8II110	Data Structures and Algorithms	G. Fertin	8/8/8	3
X8II120	Computability and complexity	G. Fertin	8/8/8	3
X8II130	User Interface Design	E. Languenou	18/12/18	6
X8IA020	Compilation	M. Oussalah	48	6
X8IA030	Logiciel extensible	G. Ardourel	48	6
(EMN)	Gestion des opérations	O. Péton	45	6

Free Options

X8II100	Summer Internship	-	summer	-
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Semester 2 abroad

Program S2 abroad: Bilateral Erasmus agreements

- Université Libre de Bruxelles, Belgium (CS-oriented, **En**),
- Université de Mons, Belgium (CS-oriented, **Fr**),
- University of Coimbra, Portugal (CS-oriented, **En**),
- TU Kaiserslautern, Germany (Math-oriented, **En**),
- TED University-Ankara, Turkey (Indus. eng.-oriented, **En**)

Double diploma with ULB only

Free to choose your courses in “Optimization and Algorithms”.
Must validate 30 ECTS.

<http://www.ulb.ac.be/facs/sciences/info/master.html>

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Semester 1 (2012-2017)

- (36h) Scientific English 1
- (12h) Presentation and Communication Skills
- (60h) Integer Programming
- (48h) Graphs and Networks
- (24h) OR Special Topic I
- (24h) Decision Engineering
- (24h) Metaheuristics
- (24h) Non Linear Optimization

Semester 2 (2012-2017)

- (12h) Introduction to Research
- (12h) Entrepreneurship
- (48h) User Interface Design
- (36h) Scientific English 2
- (48h) Machine Learning
- (24h) Data Structures and Algorithms
- (24h) Computability and Complexity
- (48h) Compilation
- (48h) Logiciel extensible
- (24h) Multicore Programming
- (24h) Constraint Programming
- (45h) Gestion des opérations

Semester 3 (2012-2017)

- (26h) Large Scale Optimization
- (26h) Discrete Constraint Programming
- (26h) Global Optimization
- (26h) Black-box Optimization
- (26h) Multi-Objective Optimization
- (26h) Multi-Objective Metaheuristics
- (26h) Transportation and Logistics
- (26h) Planning and Scheduling
- (26h) Bioinformatics
- (26h) OR Special Topic II
- (26h) Conferences

Semester 4 (2012-2017)

- (5 months) Internship (option P ou R)

Semester 1 (2016-2017)

- (36h) Scientific English 1
- (12h) Presentation and Communication Skills
- (60h) Integer Programming
- (48h) Graphs and Networks
- (24h) OR Special Topic I
- (24h) Decision Engineering
- (24h) Metaheuristics
- (24h) Non Linear Optimization

Semester 2 (2016-2017)

- (12h) Introduction to Research
- (12h) Entrepreneurship
- (48h) User Interface Design
- (36h) Scientific English 2
- (48h) Machine Learning
- (24h) Data Structures and Algorithms
- (24h) Computability and Complexity
- (48h) Compilation
- (48h) Logiciel extensible
- (24h) Multicore Programming
- (24h) Constraint Programming
- (45h) Gestion des opérations

Semester 3 (2017-2018)

- (24h) Large Scale Optimization
- (24h) Global Constraint
- (24h) Advanced Constraint Programming
- (24h) Global Optimization
- (24h) Optimization in Robotics
- (24h) Multi-Objective Optimization
- (24h) Multi-Objective Metaheuristics
- (24h) Transportation and Logistics
- (24h) Planning and Scheduling
- (24h) Algorithms in Genomics
- (24h) Conferences and invited courses

Semester 4 (2017-2018)

- (5 months) Internship (option P ou R)

Semester 1 (2016-2017)

- (36h) Scientific English 1
- (12h) Presentation and Communication Skills
- (60h) Integer Programming
- (48h) Graphs and Networks
- (24h) OR Special Topic I
- (24h) Decision Engineering
- (24h) Metaheuristics
- (24h) Non Linear Optimization

Semester 2 (2016-2017)

- (12h) Introduction to Research
- (12h) Entrepreneurship
- (48h) User Interface Design
- (36h) Scientific English 2
- (48h) Machine Learning
- (24h) Data Structures and Algorithms
- (24h) Computability and Complexity
- (48h) Compilation
- (48h) Logiciel extensible
- (24h) Multicore Programming
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- (45h) Gestion des opérations

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- (24h) Large Scale Optimization
- (24h) Global Constraint
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- (24h) Global Optimization
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- (24h) Planning and Scheduling
- (24h) Algorithms in Genomics
- (24h) Conferences and invited courses

Semester 4 (2017-2018)

- (5 months) Internship (option P ou R)

New Courses

Semester 1 (2017-2021)

- (12h) Scientific English 1
- (24h) High level programming languages
- (24h) Computability and Complexity
- (24h) Graphs
- (60h) Integer Programming
- (24h) Graphs II and Networks
- (32h) Data Analysis
- (24h) Non Linear Optimization
- (24h) Metaheuristics
- (24h) Constraint Programming

Semester 2 (2017-2021)

- (24h) Machine Learning
- (24h) Compilation
- (24h) Datamining
- (12h) Anglais - critical reading
- (12h) Introduction to Entrepreneurship
- (12h) Introduction to Research
- (48h) Decision Engineering/Multicore Programming
- (48h) Ingénierie des réseaux/ Systèmes temps réel embarqués
- (48h) Modèles probabilistes/ Interaction et usages
- (45h) Gestion des opérations

Semester 3 (2017-2021)

- (24h) Large Scale Optimization
- (24h) Global Constraint
- (24h) Advanced Constraint Programming
- (24h) Global Optimization
- (24h) Optimization in Robotics
- (24h) Multi-Objective Optimization
- (24h) Multi-Objective Metaheuristics
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- (24h) Conferences and invited courses

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Prerequisites

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