

Master of Science in Industrial and Applied Mathematics (MSIAM)

Opening Orientation Meeting
September 23, 2014

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WELCOME to MSIAM!

Aims of the meeting

- Provide information on practical matters regarding :
 - registration
 - academic tracks
 - choice of courses
 - class schedules
 - master thesis project
 - ...
- To meet each other

Academic and administrative staff

- Academic directors
 - Olivier.Gaudoin@imag.fr : Head and DS track
 - Anatoli.louditski@imag.fr : Head and DS track
 - Eric.Blayo@imag.fr : MSC and GICAD tracks
 - Sana.Louhichi@imag.fr : Stats track
 - Laurent.Desbat@imag.fr : BHC correspondent
- Administrative professionals
 - Elena.Leibowitch@grenoble-inp.fr : Grenoble INP-Ensimag
 - latifa.hamed-abdelouahab@ujf-grenoble.fr : UFR IM²AG

Where are we?



Registration

- MSIAM is a joint academic program between Grenoble INP (Ensimag) and Université Joseph Fourier (UJF-UFR IM²AG)
- Students from UJF: register at UJF (Latifa, F005)
- Students from INP: register at INP (Elena, D002)
- Others: see table on the next slide
- Registration meeting: Thursday, September 25, from 9am
- Get through the formalities to open computer accounts : **sign now**
two IT conventions

Registration list

- **Bozhok Anastasiia: INP**
- **Bozorg Marjan: INP**
- **Dedik Darya: INP**
- **Eslahi Mohammad Ehsan: UJF**
- **Espitalier Vincent: INP**
- **Gurban Daniela: UJF**
- **Liu Li: UJF**
- **Montanari Niels: UJF**
- **Nsabimana Jean-Paul: INP**
- **Shalaeva Vera: INP**
- **Uwizeye Clarisse: UJF**
- **Zhang Chen: UJF**

First semester: September to January

- 30 ECTS scientific courses (3 or 6 ECTS each)
- 3 ECTS language course : French (compulsory for international students, **registration now**) or English (compulsory for French students)
- Ensimag students: English (1.75 ECTS) and Professional project (3 ECTS)
- Two periods: Fall and Winter
- Exams: February 9-13, 2015. Second session: April 20-24, 2015.

Second semester: February to June

- Master thesis project (27 ECTS)
- Project defenses: 22-24 June 2015
- Defense in early September is possible for Ensimag students

Tracks offered

- **Modeling and Scientific Computing**: applied analysis, numerical analysis, PDE, dynamical systems, symbolic computation,...
- **Geometry, Image and CAD**: image processing, geometric modeling, computer graphics, medical imaging,...
- **Statistics**: stochastic modeling, mathematical statistics, machine learning, biostatistics,...
- **Data Science** : optimization, machine learning, HPC, big data analysis, data mining, ...

Personalized tracks may also be built

Modeling and Scientific Computing (MSC)

- Efficient methods in optimization
- High performance computing for mathematical models
- High-performance exact computations
- Inverse methods and data assimilation
- Numerical methods for hyperbolic equations
- Model coupling
- Complex fluid modelling
- Optimal Transport, levelset: applications to image
- Wavelets and applications
- Advanced imaging
- Medical Imaging: tomography and 3D reconstruction
- Stochastic approaches for uncertainty quantification
- Software development tools and methods (not for Ensimag students)

Geometry, Image and CAD (GICAD)

- Efficient methods in optimization
- High performance computing for mathematical models
- High-performance exact computations
- Inverse methods and data assimilation
- Optimal Transport, levelset: applications to image
- Wavelets and applications
- Advanced imaging
- Medical Imaging: tomography and 3D reconstruction
- Curve and surface reconstruction
- Scientific visualization
- Software development tools and methods (not for Ensimag students)

Statistics

- Efficient methods in optimization
- High performance computing for mathematical models
- Wavelets and applications
- Computational biology
- Pattern recognition and machine learning
- Nonparametric statistics
- Stochastic models for neurosciences
- Stochastic approaches for uncertainty quantification
- Monte-Carlo methods in financial engineering
- Time series analysis
- Kernel methods in machine learning
- Software development tools and methods (not for Ensimag students)

Data Science (DS)

- Efficient methods in optimization
- High performance computing for mathematical models
- Computational biology
- Pattern recognition and machine learning
- Stochastic models for neurosciences
- Monte-Carlo methods in financial engineering
- Kernel methods in machine learning
- Information access and retrieval
- Data management in large-scale distributed systems
- Software development tools and methods (not for Ensimag students)

Choosing the lectures

- The form is available on MSIAM website: msiam.imag.fr.
- Fill in the form and send it by e-mail to
 - olivier.gaudoin@imag.fr
 - anatoli.iouditski@imag.fr
- Deadline: **Friday Sept.26, 19h**
- Timetable: <https://edt.grenoble-inp.fr/2014-2015/exterieur>

Optional revision/update lectures

- Partial Differential Equations (recommended for MSC)
 - **Today** 15h15-18h30, F319
 - **Tomorrow** 13h30-15h, F117-F118
- Algebra (recommended for all)
 - **Tomorrow** 8h-11h15, F107
 - **Thursday** 9h45-13h, F112

Master thesis project

- **Research project in applied mathematics**
- In academic laboratories or research centers in industry
- In France or abroad
- Key dates
 - November, 13: project proposal meeting
 - Full-time: from February to June
 - Defenses first round: June, 22-24
 - Possible extension: from July to September
 - Defenses second round: beginning of September (only for Ensimag students)

Project hosting organisations

- Academic laboratories
 - In Grenoble: LJK, TIMC, LIG, GIPSA, INRIA,...
- Research centers
 - In Grenoble: Orange labs, CEA, ST Microelectronics, Schneider Electric, Xerox Research Center, Hewlett-Packard, ...
- In France or abroad
- Rule: students undertaking a project outside a local academic laboratory must find a local tutor

Examples of internships 2014

- Single-Index type model to estimate the intensity of a spatial point process with applications to eye-movement data (LJK)
- Mutation models: probabilistic study and parameter estimation (LJK)
- Fast algorithms for the inference of ancestry proportions from spatial population genomic data sets (TIMC)
- Nonuniform sampling and synchro-squeezing of multicomponent signals (LJK)
- Multiple objects detection and segmentation in an image sequence based on a coherent probabilistic model (MICA – Hanoi – Vietnam)
- Visualisation in-situ pour la compréhension statistique des résultats de simulation en mécanique des fluides (EDF)
- Simulations numériques de fluides complexes appliquées à des problèmes environnementaux (LJK)
- Création d'une démonstration valorisant l'intégration de la solution Big Data d'IBM dans un environnement MainFrame d'IBM (IBM)
- Fusion de capteurs par apprentissage pour le tracking de mouvement (Dassault Systèmes)

Graduation rules

Award of Master degree (non Ensimag students)

- Range of marks: 0 to 20
- Mark of 7 or above for each unit
- Weighted average mark of 10 or above for both semesters
- In case of failure, a second session is proposed

Ensimag students: validation of semester 1 as above +
Professional project

Grading rules may vary (exam, lab work,...). Check the
rules with your lecturer...

Grading system

[16, 20]	Excellent
[14,16[Very good
[12,14[Good
[10,12[Passable
[0,10[Fail

Information

- MSIAM website: <http://msiam.imag.fr>
- Timetable: <https://edt.grenoble-inp.fr/2014-2015>
- MSIAM billboard in Ensimag's lobby
- Elena's office: Ensimag Registrar's office D002
- Latifa's office: UFR IM²AG Registrar's office F005.
- olivier.gaudoin@imag.fr, anatoli.iouditski@imag.fr

Thank you for your attention

Questions?

msiam.imag.fr