

Master of Science in Industrial and Applied Mathematics (MSIAM)

Opening Orientation Meeting
September 21, 2015

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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 Stats track
 - laurent.desbat@imag.fr : Head and BHC correspondent
 - eric.blayo@imag.fr : MSC and GICAD tracks
 - anatoli.iouditski@imag.fr : DS track
- Administrative secretaries
 - 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 tomorrow: Tuesday, September 22, from 9am
- Get through the formalities to open computer accounts : **sign now two IT conventions**

Registration list

- **Green** : register at INP
- **ASHURBEKOVA Karina**
- **GOYAL Ragav**
- **KADUKOVA Maria**
- **KUNYTSKA Veronika**
- **MOSSINA Luca**
- **PHAM Dang Khoi**
- **SATTAROV Aremii**
- **YEMANE Abrehe**
- **Orange** : register at UJF
- **DVORNIK Nikita**
- **KABALANE Hadi**
- **MOLAZEM Ronak**
- **KIYENI Silas Kipchirchir**
- **KURDYAEVA Tamara**
- **PINCHUK Denis**
- **SUN Weiyi**
- **ULLAH Najeeb**

First semester: September to January

- 30 ECTS scientific courses (3 or 6 ECTS each)
- 3 ECTS language course : French or English (see next slide)
- 3A Ensimag students: English (1.75 ECTS) and Professional project (3 ECTS)
- Two periods: Fall and Winter
- Exams: February 8-12, 2016. Second session: April 11-15, 2016.

Second semester: February to June

- Master thesis project (27 ECTS)
- Project defenses: End of June or beginning of September 2016
- For an application to PhD research grants from doctoral school MSTII, defense in June is mandatory

Language courses

Registration now

French (FLE: Français Langues Etrangères)

- Compulsory for international students
- A French test which will be organized on September 30
- Courses from October 5 to January 8
- Informations on groups and courses timetable will be given after the test

English

- Compulsory for French students
- Courses on Tuesdays afternoon, from October 6 to January 19

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)

- Advanced imaging
- Efficient methods in optimization
- High performance computing for mathematical models
- High-performance exact computations
- High resolution seismic imaging by waveform transform
- Inverse methods and data assimilation
- Numerical methods for hyperbolic equations
- Mathematical modelling in life science: reaction-dispersion models
- Medical Imaging: tomography and 3D reconstruction
- Optimal Transport, level-set: applications to image
- Stochastic approaches for uncertainty quantification
- Wavelets and applications
- Software development tools and methods (not for Ensimag students)

Geometry, Image and CAD (GICAD)

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

Statistics

- Advanced algorithms for machine learning and data mining
- Advanced learning models
- Computational biology
- Efficient methods in optimization
- Foundations of supervised learning
- High performance computing for mathematical models
- Pattern recognition and machine learning
- Stochastic approaches for uncertainty quantification
- Stochastic calculus and applications to finance
- Stochastic modelling for neurosciences
- Time series analysis
- Wavelets and applications
- Software development tools and methods (not for Ensimag students)

Data Science (DS)

- Advanced algorithms for machine learning and data mining
- Advanced learning models
- Computational biology
- Data management in large-scale distributed systems
- Efficient methods in optimization
- Foundations of supervised learning
- High performance computing for mathematical models
- Pattern recognition and machine learning
- Stochastic modelling for neurosciences
- 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
 - laurent.desbat@imag.fr
- Deadline: **Friday Sept 25, 19h**
- Timetable: <https://edt.grenoble-inp.fr/2015-2016/exterieur>
- Pay attention to the balance between fall and winter periods!

Optional revision/update lectures

- Partial Differential Equations (recommended for MSC)
 - **Wednesday, 23**, 13h30-16h45, F115
 - **Friday, 25**, 8h-11h15, F109
- Algebra (recommended for all)
 - **Wednesday, 23**, 8h-11h15, F114
 - **Thursday, 24**, 9h45-13h, F118

Master thesis project

- **Research project in applied mathematics**
- In academic laboratories or research centers in industry
- In France or abroad
- Key dates
 - Full-time: from February to June
 - Defenses first round: June, 20-24
 - Defenses second round: September, 1-2

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 2015

- Martingale approach to optimal stopping problems (LJK)
- Problème de régularisation de contours en présence de singularités (LJK)
- De la simulation à la visualisation de coulées volcaniques (LJK)
- Video and Text Alignment (LJK)
- Asymptotic preserving schemes for Maxwell–Bloch equations (LJK)
- Deep learning and fusion for multimedia indexing (LIG)
- New learning models for large-scale hierarchical classification (LIG)
- Coupled hidden Markov models for joint analysis of eye-movements and EEGs (Gipsa-lab)
- Segmentation du myocarde sur des images SPECT 3D (Gipsa-lab)
- Vehicle Sharing Systems: Analysis, modeling, simulation, optimization (G-SCOP)
- Tests pour processus de Poisson et application en neurophysiologie (MAP5, Paris)
- Modélisation de l'injection d'un gaz et de ses effets dans un procédé industriel de dépôt de particules solides (DBV Technologies, Bayeux)
- Elaboration d'algorithmes de prévision de consommation (ATOS WorldGrid, Grenoble)
- Galaxy formation with newly-developed mesh-free hydrodynamic simulation methods (Hokkaido University, Japan)

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/2015-2016>
- 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, laurent.desbat@imag.fr

**Students registering to INP,
let's take a picture
(internal use, « trombinoscope »)**

Thank you for your attention

Questions?

msiam.imag.fr