Master en génie mécanique @ EPFL
A. Master degree @EPFL
B. Orientations/specializations
C. Where to find SGM information ?
D. Specific information : specializations, minor, Project et SHS
E. Professors and laboratories
Contact:

- Pr. Guillermo Villanueva
- Dr. Alain Prenleloup
- Mme Burdet Ines
- Mme Anne Legrand
Contact:

- Reception hours:
  10h – 12h Monday to Friday

- By appointment or by email:
  sgm@epfl.ch
A. Master degree @EPFL

Neuchâtel

Lausanne

EPFL worldwide

Sion
The EPFL should be a model university in terms of:

- Its culture of respect, tolerance and integrity
- The rich variety of para-academic activities
The EPFL should be a model university in terms of:

- Harassment, violence and discrimination are not tolerated here
- Provide and seek support
- Talk about it, bring up the problems

> go.epfl.ch/tsn (Trust and Support Network)
> Take the online training on Moodle: « Promoting Respect »
Statistic: students - teachers

A. Master degree @EPFL
A. Master degree @EPFL

Bachelor: 180 ECTS

Master: 120 ECTS

European Credit Transfer and Accumulation System: 1 ECTS = 30 work hours (60 ECTS per year x 30 work hours / 45 work weeks = 40 hours by weeks)
# MSc curriculum (120 ECTS)

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electives in Mechanical Engineering</strong></td>
<td>≥44 ECTS</td>
</tr>
<tr>
<td>Specialization: ≥ 30 ECTS</td>
<td></td>
</tr>
<tr>
<td>(Excel form on sgm.epfl.ch)</td>
<td></td>
</tr>
<tr>
<td><strong>Other electives / Minor</strong></td>
<td>≥30 ECTS</td>
</tr>
<tr>
<td><strong>1 Semester Project in Mechanical Engineering</strong></td>
<td>10 ECTS</td>
</tr>
<tr>
<td><strong>SHS Course + Project</strong></td>
<td>6 ECTS</td>
</tr>
<tr>
<td><strong>Internship and Master Project in Mechanical Engineering</strong></td>
<td>30 ECTS</td>
</tr>
</tbody>
</table>
B. Orientations/specializations

- Biomechanics
- Control, Robotics, and Systems
- Design and Manufacturing
- Thermal Sciences and Energy
- Mechanics of Fluids
- Mechanics of Solids and Structures
B. Orientations/specializations

CONTROL, ROBOTICS, AND SYSTEMS
- Control of Complex Adaptive Systems
- Robotics and Artificial Intelligence
- Optimization and Control of Intelligent Systems
- Data-Driven Modelling and Control
- Modelling and Control of Unique Interactive Robotics Systems
- Humanoid Control
- Multi-agents learning and control

THERMAL SCIENCES AND ENERGY
- Conversion of Renewable Energies
- Analysis and Synthesis of Sustainable Process and Energy Systems
- Nanophotonic Engineering of Light-Energy Harnessing, Conversion and Storage Systems
- Fuel Cells and Electrolysis

MECHANICS OF SOLIDS AND STRUCTURES
- Multiscale Mechanics Modeling
- Soft Materials
- Flexible Structures
- Nano-Electro-Mechanical Systems

MECHANICS OF FLUIDS
- Cavitation and Multiphase Flows
- Hydrodynamic Instabilities and Free Interface Phenomena
- Unsteady Flow Diagnostics
- Emergent Complexity in Physical Systems

DESIGN AND MANUFACTURING
- Computational Robot Design and Fabrication
- Micromechanical and Horological Design
- Information and Communications Technology for Sustainable Manufacturing
- Development of Environmentally Conscious Microfabrication Processes and Microsystems
- Applied Mechanical Design
- Development of Multi-Functional Stretchable Materials

BIOMECHANICS
- Biomechanical Orthopedics
- MicroBioRobotics Systems Development
- Locomotion Control and Biorobotics
C. Where to find SGM information?

Useful documents
- Overview
- Master Cycle course list
- Admission criteria and application
- Semester projects
- Master projects
- Engineering Internship
- Specializations
- Minor in Mechanical Engineering
- Minor in Energy

Page générale de l’IGM: https://sti.epfl.ch/fr/sgm/
Orientation: https://sti.epfl.ch/fr/sgm/specialisations/

C. Where to find SGM information?

Useful documents
Overview
Master Cycle course list
Admission criteria and application
Semester projects
Master projects
Engineering Internship
Specializations
Minor in Mechanical Engineering
Minor in Energy
Documents utiles : [https://sti.epfl.ch/fr/sgm/documents-utiles/](https://sti.epfl.ch/fr/sgm/documents-utiles/)

C. Where to find SGM information?

---

Useful documents

- Overview
- Master Cycle course list
- Admission criteria and application
- Semester projects
- Master projects
- Engineering Internship
- Specializations
- Minor in Mechanical Engineering
- Minor in Energy
**Plan Individuel d'études Master**

**Concentration: not mandatory!**  
**Concentration advisor's signature: needed only if you do a concentration**

<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>ECTS</th>
<th>Semester</th>
<th>Duration</th>
<th>Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course 1</td>
<td>1234</td>
<td>4</td>
<td>Semester 1</td>
<td>4</td>
<td>First year</td>
</tr>
<tr>
<td>Course 2</td>
<td>5678</td>
<td>6</td>
<td>Semester 2</td>
<td>6</td>
<td>Second year</td>
</tr>
<tr>
<td>Course 3</td>
<td>9012</td>
<td>8</td>
<td>Semester 3</td>
<td>8</td>
<td>Third year</td>
</tr>
</tbody>
</table>

**44+ ECTS**  
From the list on the 2nd sheet + 2 Bachelor courses (to be approved by Section Director)

**16 ECTS**  
Semester project + SHS

**30+ ECTS**  
Minor or any courses including those from the list on the 2nd sheet

Becomes green if your plan complies with the rules

**Suggested workload 25-35 ECTS / semester**
<table>
<thead>
<tr>
<th>SGM</th>
<th>Reconnu pour GM</th>
<th>Tableau</th>
<th>Description</th>
<th>Date de mise à jour</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SGM**

**Reconnu pour GM**
What are the learning prerequisites?
How to choose and register for courses?

1. Create your study plan for the 3 semesters (Excel form)
2. If you do a specialization: submit it for approval to the concentration advisor and then to SGM secretariat
3. A course can count once either in a Minor or in Groupe « options »
4. Register for courses in IS-Academia (mandatory) before September 29th
5. Announce all major modification (ex: minor surrender) of your study plan to our secretariat (update and submit your form)
6. Exam withdraw until the 10th week’s semester, except for semester courses (November 26)
7. 2 Bachelor courses may eventually be accepted with the section’s Director prior agreement
How to choose and register for courses?

General exam withdrawal deadline for 2023-24 Winter Session: 24 November 2023

It is not possible to withdraw after 29th September from the semester courses listed here:

- ME-403 Applied mechanical design
- ME-482 Biomechanics of the musculoskeletal system
- ME-414 Computational multi-scale modeling of solids
- ME-498 Continuous improvement of manufacturing systems
- ME-428 Data-driven design & fabrication methods
- ME-412 Experimental methods in engineering mechanics
- ME-516 Lifecycle performance of product systems
- ME-410 Mechanical product design and development
- ME-480 Mechanobiology: how mechanics regulate life
How to choose and register for courses?

General exam withdrawal deadline for 2023-24 Winter Session: 24 November 2023

It is not possible to withdraw after 29th September from the semester courses listed here:

- ME-469 Nano-scale heat transfer
- ME-474 Numerical flow simulation
- ME-419 Production management
- ME-467 Turbulence
- MICRO-413 Advanced additive manufacturing technologies
- ENV-542 Advanced satellite positioning
- MICRO-421 Imaging optics
- MGT-555 Innovation & entrepreneurship in engineering
- MICRO-401 Machine learning programming
- MSE-351 Surface analysis
How to choose and register for courses?

Art. 12 al. 5 (english)

It is the student’s responsibility to have a study plan that complies with the section rules
Minors: subscription before the end of the first semester

Recommended Minors (any other EPFL Minor is accepted)

- Energy
- Management of technology and entrepreneurship
- Computational science and engineering
- Materials science and engineering
- Biomedical technologies
- Spatial technologies
- Engineering for Sustainability

Procedure

- Select the minor in IS-Academia
- Contact the Minor advisor
- Fill-in the registration form (copy to SGM)
- Register for courses in IS-Academia
- Withdrawal from a Minor: contact SGM to convert part of the Minor’s ECTS to electives
Specializations are elective

- Domain consolidation
- 30 ECTS with variable fundamental base courses

30 credits fundamental base courses:

- A Fluid mechanics: 17
- B Automatic and systems: 9
- C Design and Production: 17
- D Thermal sciences: 15
- E Mechanics of Solids and Structures: 8
- F Biomechanics: 8
Semestre project

- Semester projects in Mechanical Engineering
  - Projet I : mandatory; 10 ECTS (10 x 30 h /14 weeks \( \approx 21.5 \) hours per week)
  - Projet II : elective; 10 ECTS

- Visit the web pages of the various laboratories, and make sure that the teacher responsible for the project is affiliated with the Institute of Mechanical Engineering. If this is not the case, you must submit the project to the Section Director for approval.

- Registration procedure :
  1. Find a project
  2. Contact the project manager
  3. Request authorization to carry out a project outside GM
  4. Register the project in IS-A (student portal, course selection)
  5. Have the form signed by the professor (or research professor) responsible for supervision
  6. Forward the form to the secretary's office
### SHS (social and Human sciences)

The SHS program is over two semesters (Fall-Spring)

REGISTER NOW!
Master project

- 2 alternatives
  - At EPFL under the (co)supervision of an SGM teacher
  - Outside EPFL (University or company, combined or not with the internship) under the (co)supervision of an SGM teacher

- Duration (+1 week for vacation)
  - at EPFL: 17 weeks
  - outside EPFL: 25 weeks

- Conditional PDM: minimum of 82 ECTS
- Informative course sheet ME-599
- Expected work: Written report, oral presentation and poster
- Evaluation method: Oral defense of the written report
Projet de Master

- Visit the web pages of the various laboratories and make sure that the teacher in charge of the project is affiliated with the Mechanical Engineering Section. If not, you'll need to find a co-supervisor from the Mechanical Engineering Institute.

- Project registration:
  1. The subject must be defined by, or in conjunction with, the GM Section Professor.
  2. The dates and conditions (e.g. location, contact person) of the PDM must be defined.
  3. In the case of in-company projects, it is generally necessary to sign a contract between the company and the student (private contract, covering, among other things, working conditions).
  4. For projects abroad (university or company), check entry requirements (visa)
  5. Register the project in IS-Accademia
  6. Print out the form (ISA) and have it signed by the professor (or research professor) responsible for supervision
  7. Send the form to the secretariat
Industrial internship

- When to do an internship
  - Between bachelor's and master's degrees
  - Between semesters (during the summer)
  - During a semester off
  - In parallel with a semester (not necessarily full-time)
  - With the Master's project

- How to find an internship
  - Internship portal
  - Personal search and validation request to the section deputy

- Other
  - Minimum duration 8 weeks and maximum 6 months (average ~5 months)
  - Outside universities
  - Requirements corresponding to the skills of a mechanical engineer
  - Agreements imposed by companies are generally refused by the school
Industrial internship

- Three-way contract between the student, the company (usually the internship supervisor or HR) and the academic supervisor (alain.prenleloup@epfl.ch)
- If you have any questions, please contact the STI faculty internship coordinator (hind.klinke@epfl.ch)
- Full presentation will take place in October, 12:00 – 13:00
Be aware that!

- You need to pass each exam
- The 44 ECTS in Mechanical Engineering can only come from the list in the Excel sheet
- You need 30 ECTS for a specialization
- If you do a Minor you are not allowed to take any additional ECTS outside Mechanical Engineering
- Begin your SHS this Fall
- To begin you Master Project you must have passed at least 82 ECTS
- Dedicated presentation with Q&A: Monday 25 September
E. Professeurs et laboratoires
E. Professeurs et laboratoires
E. Professeurs et laboratoires
E. Professeurs et laboratoires
E. Professeurs et laboratoires
E. Professeurs et laboratoires
Thanks for your attention

sgm@epfl.ch