

Bienvenue – Welcome

Mechanical Engineering



SGM Contacts

Director



Prof. Guillermo Villanueva

Deputy



Dr. Alain Preneloup

Secretary



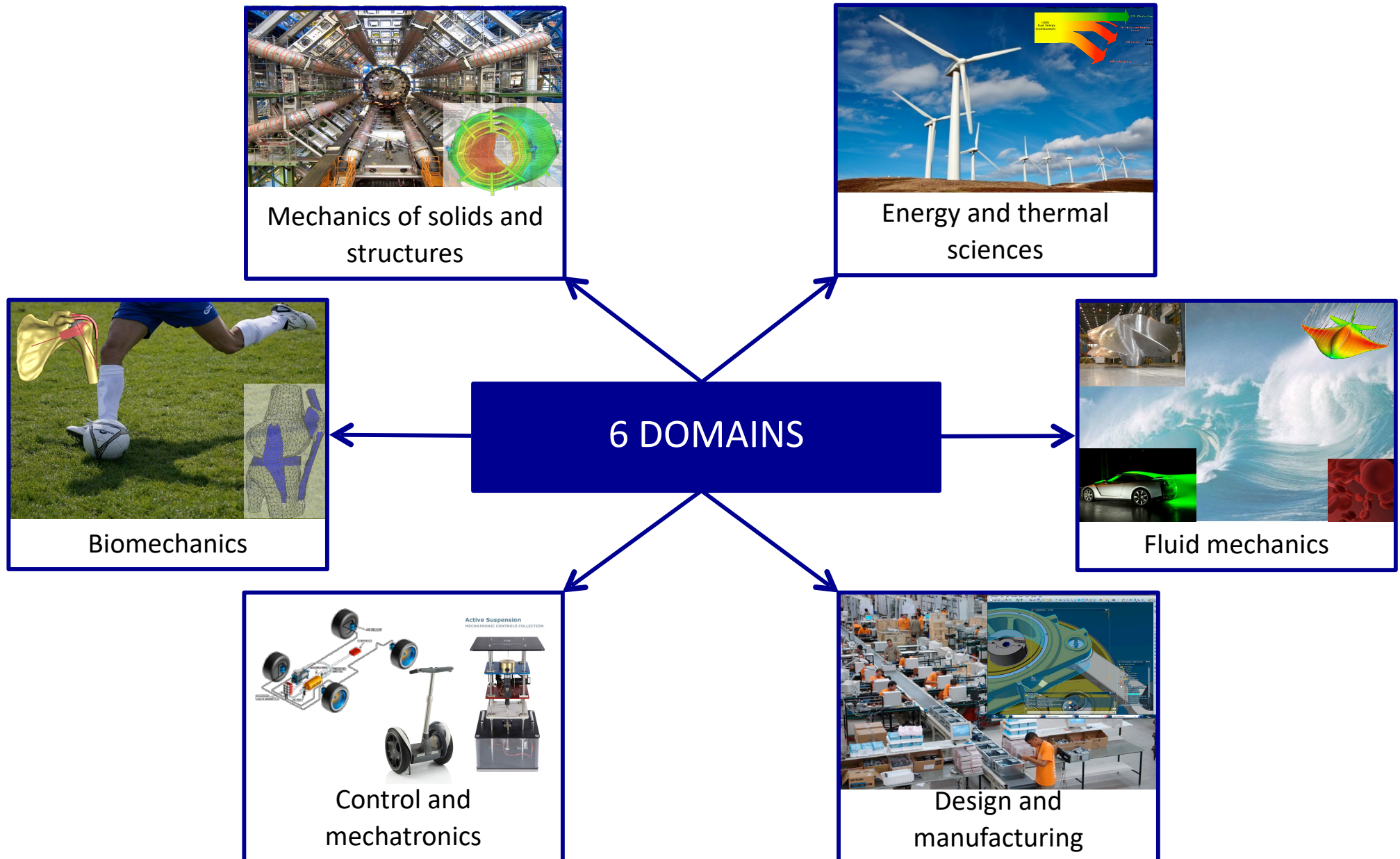
Mrs Tamara Pelège



Exchange study advisor:
Prof. Giancarlo Ferrari Trecate

All about your SGM contacts

SGM MSc domains/specializations



Rules: key webpage

Rules and procedures

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Courses: choice and registration

- ❑ Create your study plan for up to 3 semesters
- ❑ Can choose courses from other EPFL master programs, if your University allows for it
- ❑ **MANDATORY: register for courses in IS-Academia before the end of the 2nd week of the semester**
 - ❑ Your Learning Agreement is not enough
 - ❑ Registering implies automatic registration for the exam
- ❑ Exam withdraw until the 10th week's semester
 - ❑ For some courses (tagged “sans retrait”) **withdrawal is not allowed after the registration deadline** - highlighted with an alert in the registration tab on IS-Academia.

Academic calendar



MEMENTO

Mementos ▾

Announce an event

Subscribe



FR | EN

► Memento

Memento Academic Calendar

Academic year

2018-2019

18.9 - 21.12.18: Courses

14.1 - 2.2.19: Exams

18.2 - 31.5.19: Courses

17.6 - 6.7.19: Exams

2019-2020

17.9 - 20.12.19: Courses

13.1 - 1.2.20: Exams

17.2 - 29.5.20: Courses

15.6 - 4.7.20: Exams

[Academic year](#)

FILTER YOUR SEARCH

◀ September 2019 ▶

Mon	Tue	Wed	Thu	Fri	Sat	Sun
26	27	28	29	30	31	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	1	2	3	4	5	6

Arrival

Enrolment for new master students

11.09.2019 > 12.09.2019

Category : Academic Calendar

Arrival

Course "Apprendre à étudier à l'EPFL"

12.09.2019

Category : Academic Calendar

Arrival

Welcome day for new students

13.09.2019

Category : Academic Calendar

Application

Online application deadline for prospective PhD students in the EDAM, EDAR, EDCE, EDCH, EDDH, EDEE, EDEY, EDMA, EDME, EDMI, EDPO and EDRS doctoral programs

15.09.2019

Category : Academic Calendar

Bank holiday

Jeûne Fédéral (public holiday)

16.09.2019

Category : Academic Calendar

Courses

Autumn semester courses start

17.09.2019

Category : Academic Calendar

Courses: learning prerequisites

FICHES DE COURS

Propédeutique Cycle Bachelor Cycle Master Mineur Ecole doctorale



Advanced control systems

ME-524

Enseignant(s) :

Karimi Allreza

Langue:

English

Withdrawal

It is not allowed to withdraw from this subject after the registration deadline.

Summary

This course covers some theoretical and practical aspects of robust and adaptive control. Robust controller design with H-infinity performance, digital controller design with pole placement technique, direct, indirect and switching adaptive control are studied and implemented in a hands-on lab.

Content

Stability, performance and robustness of closed-loop control systems. Robust controller design by loop shaping. Robust H-infinity controller design in the frequency domain. Multivariable decoupling controller design. Gain-scheduled controller design.

Two-degree of freedom RST digital polynomial controller. Pole placement technique and its relation to Internal Model Control (IMC), Model Reference Control (MRC) and Minimum Variance Control (MVC). Robust pole placement with Q parameterization. Parameter adaptation algorithms. Direct and Indirect adaptive control. Switching adaptive control.

Keywords

Adaptive control, robust control, digital RST controller.

Learning Prerequisites

Required courses

Control systems + Lab

Recommended courses

1. Control Systems
2. System Identification
3. Multivariable systems

Important concepts to start the course

- Analyze a linear dynamical system (both time and frequency responses)
- Represent a linear system by a transfer function
- Identify a dynamic system using experimental data
- Design a PID controller
- Design a simple controller for a dynamic system

Learning Outcomes

By the end of the course, the student must be able to:

- Design an advanced controller for a dynamic system, A11
- Assess / Evaluate the stability, performance and robustness of a closed-loop system, A12
- Define (specifications) the adequate control performance for dynamic systems, A13
- Propose several control solutions, formulate the trade-offs, choose the options, A14

DANS LES PLANS D'ÉTUDES

Génie mécanique, 2018-2019, Master semestre 2

Semestre	Forme de l'examen
Printemps	Pendant le semestre
Crédits	Matière examinée
3	Advanced control systems
Cours	Projet
2 Heure(s) hebdo x 14 semaines	1 Heure(s) hebdo x 14 semaines

Génie mécanique, 2018-2019, Master semestre 4

Gestion de l'énergie et durabilité, 2018-2019, Master semestre 2

Gestion de l'énergie et durabilité, 2018-2019, Master semestre 4

Microtechnique, 2018-2019, Master semestre 2

Microtechnique, 2018-2019, Master semestre 4

Robotique, 2018-2019, Master semestre 2

Mineur en Systems Engineering, 2018-2019, Semestre printemps

SEMAINE DE RÉFÉRENCE

	Lu	Ma	Me	Je	Ve
8-9					
9-10			MER331		
10-11			MER334		
11-12					
12-13					
13-14					
14-15					
15-16					
16-17					
17-18					
18-19					
19-20					
20-21					
21-22					

Cours Exercice, TP Projet, autre

LÉGENDE

Learning Prerequisites

Required courses

Control systems + Lab

Recommended courses

1. Control Systems
2. System Identification
3. Multivariable systems

Important concepts to start the course

- Analyze a linear dynamical system (both time and frequency responses)
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Restricted courses

Partner Universities

Conditions

Preparation of the application

Application procedure and deadlines

Studies

At your arrival at EPFL

Useful information

Contacts

Conditions

You must have been **selected** by your home university, which has to be a **partner institution** of EPFL.

We expect that you register for a minimum of **20 ECTS credits** (European Credits Transfer System) per semester. One French course of 3 ECTS can count towards the 20 ECTS.

An exchange to attend courses at EPFL is authorized for **one semester or a full academic year**. The exchange cannot exceed two semesters.

It is recommended to have **good command of French and/or English (level B2)**. Bachelor courses are mainly taught in **French** and Master courses are mainly taught in **English**.

No language certificate is required for an exchange at EPFL. However, it is your responsibility to ensure that you have sufficient knowledge of French and/or English to follow the courses.

Restricted courses/projects

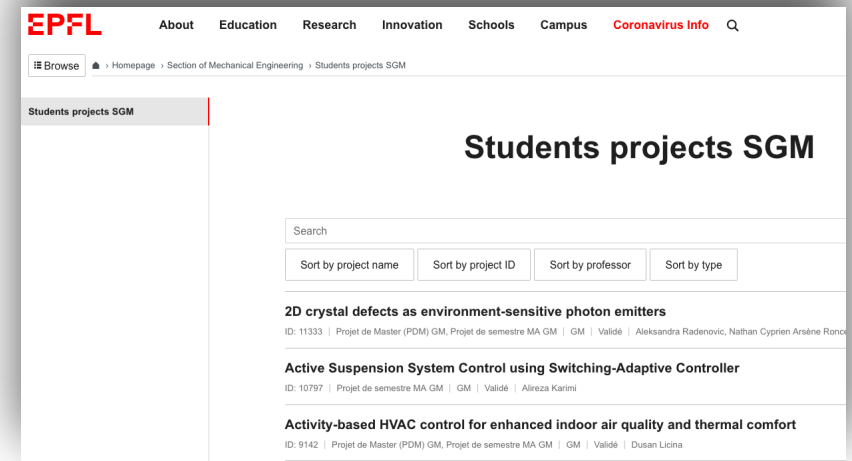
The courses and projects listed here are not accessible to exchange students in 2019-20.



<https://www.epfl.ch/education/international/fr/venir-etudier-a-l-epfl/semestres-cours/conditions/>

Semester projects

- ❑ Semester projects in Mechanical Engineering
 - ❑ Project I: mandatory for EPFL students (10 ECTS)
 - ❑ Project II: elective for EPFL students (10 ECTS)
 - ❑ Starting date: semester's starting day
 - ❑ Report handing-in date: a few days before the corresponding exam session
- ❑ Registration procedure
 - ❑ Find the project by yourself
 - <https://inside.epfl.ch/projets-etudiants-sti/students-projects-sgm/>
 - ❑ Register for the project in IS-Academia and print the registration form
 - ❑ Get the form signed by the SGM teacher in charge of the project
 - ❑ Submit the signed form to SGM



Other types of projects

- ❑ Specific for exchange students
 - ❑ EPFL-301 “Project spécifique pour étudiant d’échange et visiteur”. The number of credits can be adapted.
 - ❑ As for semester projects, you have to find the project by yourself

- ❑ Bachelor-level project
 - ❑ “Projet d'Ingegnerie Simultanée» – 5 credits
 - ❑ During the spring semester
 - ❑ **MANDATORY registration before November 30th – send an email to the SGM secretary Mme Pelège**

Social and Human Sciences (SHS) Program

The SHS program is an integral part of all study plans at EPFL, from the first year of a Bachelor's degree to the first year of the Master's degree. It offers students a great freedom of choice, from around 150 courses that cover a wide range of humanities and social sciences.

Among these courses, 18 are also open to UNIL students, 5 of them on a permanent basis.

Courses' timetables

BA 1st year propedeutic, spring: **Tuesday 5.15 pm-7 pm**

BA semester 3 and 4: **Tuesday 3.15 pm-5 pm**

BA semester 5 and 6: **Tuesday 1.15 pm-3 pm**

Master semester 1 and 2: **Wednesday 4.15 pm-7 pm**

> [Download the SHS 2022-2023 course brochure \(pdf\)](#)

→ [Search for SHS course](#)

**The SHS program is over two semesters
(fall and spring)
REGISTER NOW!**

Important for exchange students

- ☞ For students who followed courses at EPFL as exchange students and apply for an EPFL Master's Program:
 - ☞ **If some Master credits obtained during your exchange program were not used at your university of origin, you will be able to validate them for your Master's Program at EPFL (30 credits maximum).**

Welcome page for exchange students

EPFL

About Education Research Innovation Schools Campus 50 years Q

FR | EN

Browse ▶ Education ▶ Study management ▶ Prepare yourself for EPFL ▶ New exchange students

New CMS students

New Bachelor students

New Master students

New exchange students

New doctoral students

Starter kit for Bachelor students
(resources in French)

Séminaire « Apprendre à étudier
à l'EPFL »

Welcome Day for all new students

International Day

Coaching for new bachelors

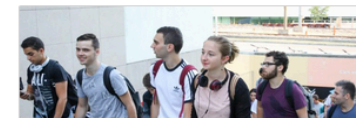
Making the transition to university
life

How to deal with culture shock

New exchange students



3 key dates for your academic
start 2019



<https://www.epfl.ch/education/studies/en/preparation-epfl/new-exchange-students/>

EPFL

SGM
Section de Génie mécanique



STUDENTS ASSOCIATION IN MECHANICAL ENGINEERING

-> **Your association !**

<https://amac.epfl.ch/>

Association for exchange students



ACTIVITIES THE ASSOCIATION INCOMING STUDENTS TITANIC LÉMANIQUE PARTNERS CONTACT



ESN LAUSANNE WELCOME WEEK | CHALET WEEKEND

Friday, 13 September, 2019 - 14:30 to
Sunday, 15 September, 2019 - 21:00

UPCOMING EVENTS



11/09/2019 - 10:00 to 12:00
**ESN Lausanne
Welcome Week |
Olympic Museum**



11/09/2019 - 13:00 to 21:00
**ESN Lausanne
Welcome Week |
Olympiads BBQ**



12/09/2019 - 09:00 to 11:30
**ESN Lausanne
Welcome Week |
Free Breakfast**



12/09/2019 - 13:30

NEWS



17/07/2018 - 22:52
**Registration for the
Welcome Week
coming soon!**



17/07/2018 - 22:18
**Fall 2018 - Buddy
System
registrations open!**



29/05/2018 - 19:33
**Newly Elected
Board Members for
Fall 2018!**



01/09/2017 - 11:35

WHO WE ARE

ESN EPFL is a student association whose purpose is to help international and exchange students in Lausanne make the best of their stay in Switzerland. To achieve this, we organize a wide range of events, from city tours to sport weekends, thematic parties, international dinners, and trips throughout the country. To answer the desire for integration and cultural understanding of students, we also set up a Buddy Matching system each semester, and are always willing to collaborate with other associations from EPFL and UNIL.

Our association is part of the [Erasmus Student Network](#) and of [AGEPoly](#). For

Individual support for students

EPFL

**Soutien
Conseils
Ecoute**

Pour étudiant-e-s et doctorant-e-s

Problèmes financiers

Stress et difficultés d'organisation

Mal-être (anxiété, tristesse, isolement, dépendances, pression...)

Soucis familiaux et relationnels (intégration, harcèlement...)

Questionnements sur les études (motivation, orientation...)

Aménagement des études (maladie chronique, situation de handicap, difficulté d'apprentissage...)

go.epfl.ch/soutien-individuel



Guichet étudiants

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+41 21 693 43 45

Questions ?