

# Course Introduction

**Cyber-Physical Systems Engineering:  
Stochastic Foundations**

**182.721 ESEVO → 182.747 CPSE:SF VO  
182.722 ESELU → 182.748 CPSE:SF LU**

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# Contents

## CPSE:SF VO

### Artificial Intelligence in CPS

- Intelligent agents
- Self-driving cars
- Bayes nets
- HMMs and particle filters
- Decisions
- Learning

# Logistics

## CPSE:SF VO

- Time:
  - Tuesdays 10:00–12:00
  - Thursdays 10:00–12:00
- Location: CPS-Group Library, Treitlstr. 1-3, 3rd floor
- Resources: Slides will be available in the TISS course

# Grading

## CPSE:SF VO

- Oral exam on occasion  
⇒ contact `denise.ratasich@tuwien.ac.at`
- Registration in TISS

# Contents

## CPSE:SF LU

- critical review of scientific work in the field of CPS
  - read, review and present a paper
- homework exercises related to the CPSE:SF VO classes
  - Matlab, ...
  - pen&paper
- term project: quadcopter simulation
  - challenge: waypoints race
  - system modeled in Simulink
  - design of flight control algorithms
  - sensor fusion/state estimation

# Logistics (1)

CPSE:SF LU

- Registration to the course: **TISS** (until 9.10.)
- Course organization: **TUWEL**  
(exercises, registration to delivery talk, etc.)  
<https://tuwel.tuwien.ac.at/course/view.php?id=8197>
- Work in groups of max. 3 students  
(form groups until 9.10.)
- Exercise meetings
- TILAB, room 4  
(accounts after TISS registration deadline)

# Logistics (2)

CPSE:SF LU

- 4 exercise meetings  
on Fridays 10:00, TI Seminarraum (see dates in TISS)
  - Paper presentations
  - Homework discussions
- 1 term project introduction  
on Friday 28.10. 10:00, TILAB room 4

## Compulsory Attendance

Attending paper presentations and homework discussions is mandatory! Your performance during these meetings is used for individual grading.

# Grading

CPSE:SF LU

- paper presentation and term project: group work
- exercises: single solution per group, but individually graded
- paper review/presentation: 15%
- homework exercises: 35%
- term project: 50%



# Renaming

ESE → CPSE:SF

- Course number will change, please register to the new courses (we will cancel the old ones)!
- We will inform you via TISS news (in the old and new course) when you can register to the new course CPSE:SF.
- TUWEL course remains the same:  
<https://tuwel.tuwien.ac.at/course/view.php?id=8197>

# What's next?

first CPSE:SF VO class: now

For CPSE:SF LU, please:

- enroll via TISS until 9.10.
- form groups in TUWEL until 12.10.
- process paper review and presentation assignment
- present selected paper  
during first exercise meeting on 21.10.