



Introduction to the Master's Program Electrical Systems Engineering

Today: Talk given by **Dr. Stephan Kruse** on
behalf of ***Prof. Dr. Christoph Scheytt***
Head of ESE Program

8. April 2026



Outline

➤ Elements of the Master's Program

- Lectures & Exercises
- Seminar
- Project Group
- Master's Thesis
- General Studies

➤ Structure of the Master's Program

- Specializations
- Modules

➤ Examinations

➤ Good to Know



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Elements of the Master's Program

Lectures & Exercises (*Vorlesung mit Übung*)

- 2 hours lectures and 2 hours exercises per week (V2+Ü2)

- Lectures
 - All students meet
 - Teacher talks

- Exercises
 - Students meet in 1 large group or subgroups
 - Tutor moderates discussion with students
 - Students might present or submit prepared homework



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Elements of the Master's Program

Seminar (*Seminar*)

- 2 meeting hours per week (S2)
- Teacher proposes topics
- Every student
 - selects one topic to work on,
 - prepares a talk with slides (*Seminarvortrag*) and
 - submits a written elaboration (*Ausarbeitung*).



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Elements of the Master's Program

Project Group (*Projektgruppe*)

- Two PG for half a year (or one PG for an entire year)
- Total workload per half-year PG: 1.5 days per week for 6 months
- Students
 - apply for a PG and
 - Work on a project as a team (in general: analysis, design, realization and test of a system)
- PG provide practical training in engineering tasks (can be good preparation for master thesis)



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Elements of the Master's Program

Master's Thesis (*Masterarbeit*)

- Workload: Full-time for a half a year

- What has to be done?
 - Literature review
 - Research
 - Often: Implementation of some software or hardware
 - Writing a thesis (~50-80 pages) on scientific level
 - All this: within 6 month (formally checked!)

- Two steps:
 - First: **Planning phase** (typically 1 month)
 - Second: **Execution phase** (5 month)



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Elements of the Master's Program

General Studies (*Studium Generale*)

- **Any topic from the lecture catalogue with CP**

- **Example: German language course (*Deutschkurs*)**
 - Hosted by the International Office (*Akademisches Auslandsamt*)
 - Strongly advised (a big asset for your future career!)
 - May cover the “General Studies” module
 - 1 month crash course (5 CP); Semester afternoon course (8 CP)
 - Free of charge!
 - Information: <https://www.uni-paderborn.de/en/zfs/language-courses-for-students/german>



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Structure of the Master's Program

Two Specialization Tracks

- Signal & Information Processing (S&IP)
- Electronics & Devices (E&D)

Every student selects one of the two.

Practical note: If not pre-selected in your PAUL account, select your specialization as the first thing you do in PAUL do avoid future problems when selecting courses.



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3. Examinations

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Structure of the Master's Program

MASTER OF SCIENCE ELECTRICAL SYSTEMS ENGINEERING – SIGNAL & INFORMATION PROCESSING V3

Semester	1	2	3	4		
	Advanced System Theory (6 LP)	Modeling and Simulation (6 LP)	Statistical Signal Processing (6 LP)	Compulsory Elective Fundamentals of ESE (6 LP)	Management of Technical Projects (3 LP)	General Studies (3 LP)
	Statistical and Machine Learning (9 LP)	Compulsory Elective S&I Processing (6 LP)			Project (1 x 18 LP or 2 x 9 LP)	General Studies (6 LP)
	Compulsory Elective S&I Processing (6 LP)	Elective ESE (6 LP)	Elective ESE (6 LP)			Topics in Systems Engineering (3 LP)
	Master Thesis (30 LP)					

 Electrical Systems Engineering	 Signal & Information Processing (S&I)	 Projects
 Introduction to ESE	 Introduction to S&I	 General Studies
 Fundamentals of ESE	 Management and Application	



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Structure of the Master's Program

MASTER OF SCIENCE ELECTRICAL SYSTEMS ENGINEERING – ELECTRONICS & DEVICES V3

Semester	1	2	3	4		
	Advanced System Theory (6 LP)	Modeling and Simulation (6 LP)	Analysis and Design of Electronic Circuits (6 LP)	Compulsory Elective Fundamentals of ESE (6 LP)	Management of Technical Projects (3 LP)	General Studies (3 LP)
	Electromagnetic Waves and Waveguides (9 LP)	Compulsory Elective Electronics & Devices (6 LP)			Project (1 x 18 LP or 2 x 9 LP)	General Studies (6 LP)
	Compulsory Elective Electronics & Devices (6 LP)	Elective ESE (6 LP)	Elective ESE (6 LP)			Topics in Systems Engineering (3 LP)
	Master Thesis (30 LP)					

Electrical Systems Engineering

Electronics & Devices (E&D)

Projects

Introduction to ESE

Introduction to E&D

General Studies

Fundamentals of ESE

Management and Application



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How to Organize Your Time Schedule

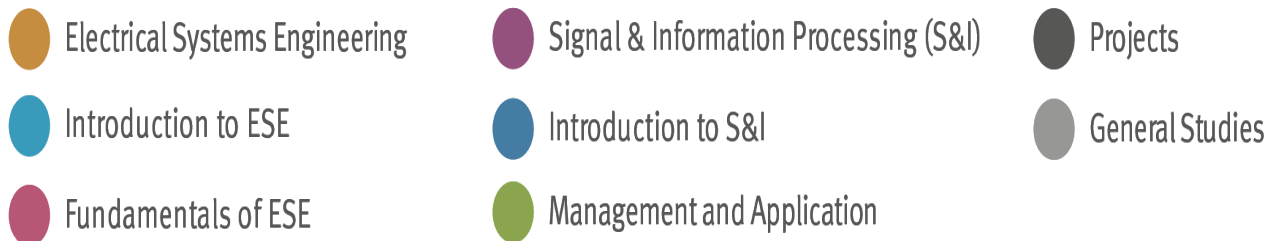
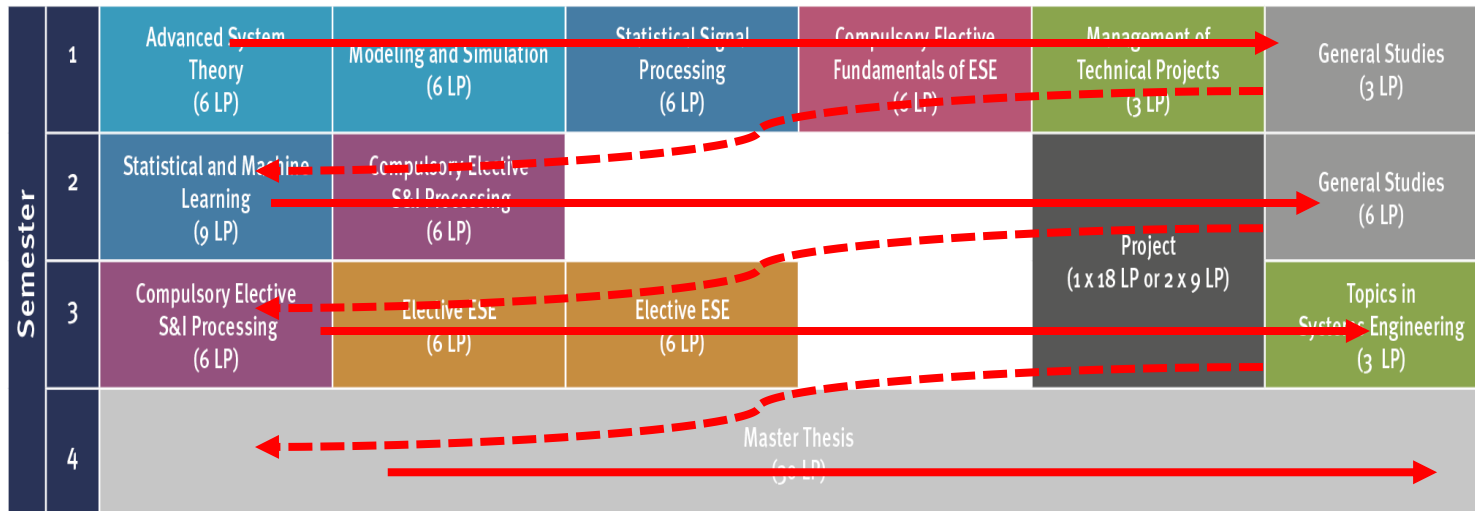
Try to clear your fundamental topics & prerequisites first. → basis for elective courses

Mix difficult & easy topics when needed.

Learn/prepare with other students.

Get advise from study advisors!

MASTER OF SCIENCE ELECTRICAL SYSTEMS ENGINEERING – SIGNAL & INFORMATION PROCESSING V3



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Studying at Different Speeds









<https://www.hni.uni-paderborn.de/sse/lehre/c-programming> (Self -Study)

L.048.92999
**C++
Programming**
Philipp
Schubert

MASTER OF SCIENCE

ELECTRICAL SYSTEMS ENGINEERING – SIGNAL & INFORMATION PROCESSING V3

Semester	1	Advanced System Theory (6 LP)	Modeling and Simulation (6 LP)	Statistical Signal Processing (6 LP)	Introduction to Algorithms	Management of Technical Projects (3 LP)	General Studies (3 LP)
	2	Statistical and Machine Learning (9 LP)	Compulsory Elective S&I Processing (6 LP)		No Background in Programming		General Studies (6 LP)
	3	Compulsory Elective S&I Processing (6 LP)	Elective ESE (6 LP)	Elective ESE (6 LP)	????		Topics in Systems Engineering (3 LP)
	4	Master Thesis (30 LP)					

-  Electrical Systems Engineering
-  Signal & Information Processing (S&I)
-  Projects
-  Introduction to ESE
-  Introduction to S&I
-  General Studies
-  Fundamentals of ESE
-  Management and Application

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Structure of the Master's Program

Compulsory Modules (*Pflichtmodule*)

- **Introduction to Electrical Systems Engineering (12 CP)**
 - Advanced System Theory
 - Modeling & Simulation

- **Management and Application (6 CP)**
 - Management of Technical Projects
 - Seminar Topics in Systems Engineering



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Structure of the Master's Program

Compulsory Optional Modules (*Wahlpflichtmodule*)

➤ Introduction to S&IP

- Statistical & Machine Learning (9 CP)
- Statistical Signal Processing (6 CP)

or

➤ Introduction to E&D

- Electromagnetic Waves and Waveguides (9 CP)
- Analysis and Design of Electronic Circuits (6 CP)

(According to the specialization chosen) (15 CP)



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Structure of the Master's Program

Elective Modules (*Wahlmodule*)

➤ **Fundamentals of Electrical Systems Engineering (6 CP)**

- Advanced Control
- Data-Driven Engineering
- Data-Driven Innovation
- Model-Based Systems Engineering
- Digital Speech Signal Processing
- High-Frequency Engineering
- Introduction to Algorithms
- Optimization-Based Control Methods

(One subject from a catalogue of further basic subjects)

➤ **Compulsory Elective S&IP or Compulsory Elective E&D (12 CP)**

(Two subjects from a catalogue for the chosen specialization)



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Structure of the Master's Program

Example: S&IP

Studying this module means: taking at least **two** of these courses!



The Following courses are offered at the moment:

- Advanced Control
- Advanced Topics In Robotics
- Algorithms and Tools for Test and Diagnosis of Systems on a Chip
- Cognitive Systems Engineering
- Digital Image Processing I & II
- Information Theory
- Nonlinear control of autonomous and robotic systems
- Numerical Simulations with the Discontinuous Galerkin Time Domain Method
- Optical Waveguide Theory
- Optimal and Adaptive Filters
- Optimization-Based Control Methods
- Reinforcement Learning
- Robotics
- Theory and Design of Phase-locked Loops
- Topics in Advanced Control
- Topics in Pattern Recognition and Machine Learning
- Topics in Signal Processing
- Wireless Communications



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Structure of the Master's Program

Example: E&D

Studying this module means: taking at least **two** of these courses!



The Following courses are offered at the moment:

- Advanced VLSI Design
- Advanced Quantum Optics
- Analog CMOS ICs
- Controlled AC Drives
- Design of Energy Transition Scenarios
- Energy Transition
- Fast Integrated Circuits for Wireline Communications
- Fundamentals of Optics
- High-Frequency Electronics
- Integrated Circuits for Wireless Communications
- Nonlinear control of autonomous and robotic systems
- Numerical Simulations with the Discontinuous Galerkin Time Domain Method
- Optical Communication A/B/C/D
- Optimization-Based Control Methods
- Optoelectronics
- Power Electronics
- Radio Frequency Power Amplifiers
- Solar Electric Energy Systems
- Theory and Design of Phase-locked Loops
- VLSI Testing



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Further Elective Modules (*Module*)

- **Electrical Systems Engineering** (12 CP)
(two subjects from all the classes offered in the field of Electrical Systems Engineering, provided that they are not credited to other modules)
- **General Studies** (9 CP)
- **Project groups**
(18 CP: one full-year or two half-year projects)
- **Master's thesis** (30 CP)



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Structure of the Master's Program

Module Manual (*Modulhandbuch*)

Available online as PDF at: go.upb.de/studi.et_regulations

Module handbooks



	SuSe 26	WiSe 25/26	SuSe 25
ESEMA v1			
ESEMA v2	Präambel + MHB	Preamble + MHB	Preamble + MHB
ESEMA v3	Präambel + MHB	Preamble + MHB	Preamble + MHB



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Examinations

➤ Modules

- In general: One oral examinations
- In some cases: Written examinations

➤ Project Group

- Permanent evaluation throughout the project

➤ Master's Thesis



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Examinations

Repetitions

- Oral and written examinations can be repeated **twice**.
- The Master's Thesis can be repeated **once**.
- Project group can be repeated twice
(You will not want to do that!)
- German language course can be repeated infinitely.



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Examinations

Examination Regulations (*Prüfungsordnung*)

Available online as PDF at: go.upb.de/studi.et_regulations

Current examination regulations

Master program Electrical Systems Engineering



	General Regulations	Specific Regulations	Amendment Statutes	Reading version
Electrical Systems Engineering Master v3	AM 32/24 (Reading Version)	AM 35/24	AM 55.24	Reading version (Reading Version)



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Examination Board

What are its tasks?

- Organizing and supervising examinations:
- ensuring compliance with the examination regulations and observance of the rules of procedure adopted for conducting examinations;
- decisions on objections to decisions taken in examination procedures;
- drawing up an annual report to the Faculty Council on the progress of the examinations and the duration of study;
- additional tasks expressly assigned to the Examination Board under these Regulations.

[Examinations Regulations Sect. 1 (1)]



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Examination Board contd.

What are its tasks? contd.

In addition, the Examination Board makes suggestions about the reform of the examination regulations and the study regulations and discloses the distribution of marks.

Examinations Regulations Sect. 1 (1)



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Examination Board contd.

Professors
Prof. Erdal Kayacan
Prof. Jens Förstner
Prof. Christoph Scheytt
Prof. Dr. Reinhold Häb-Umbach
Academic Staff
Dr. Markus Hennig
Student Members
Matthias Johannes Geilhorn
Daniel Figge



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Examination Board contd.

How to file a request?

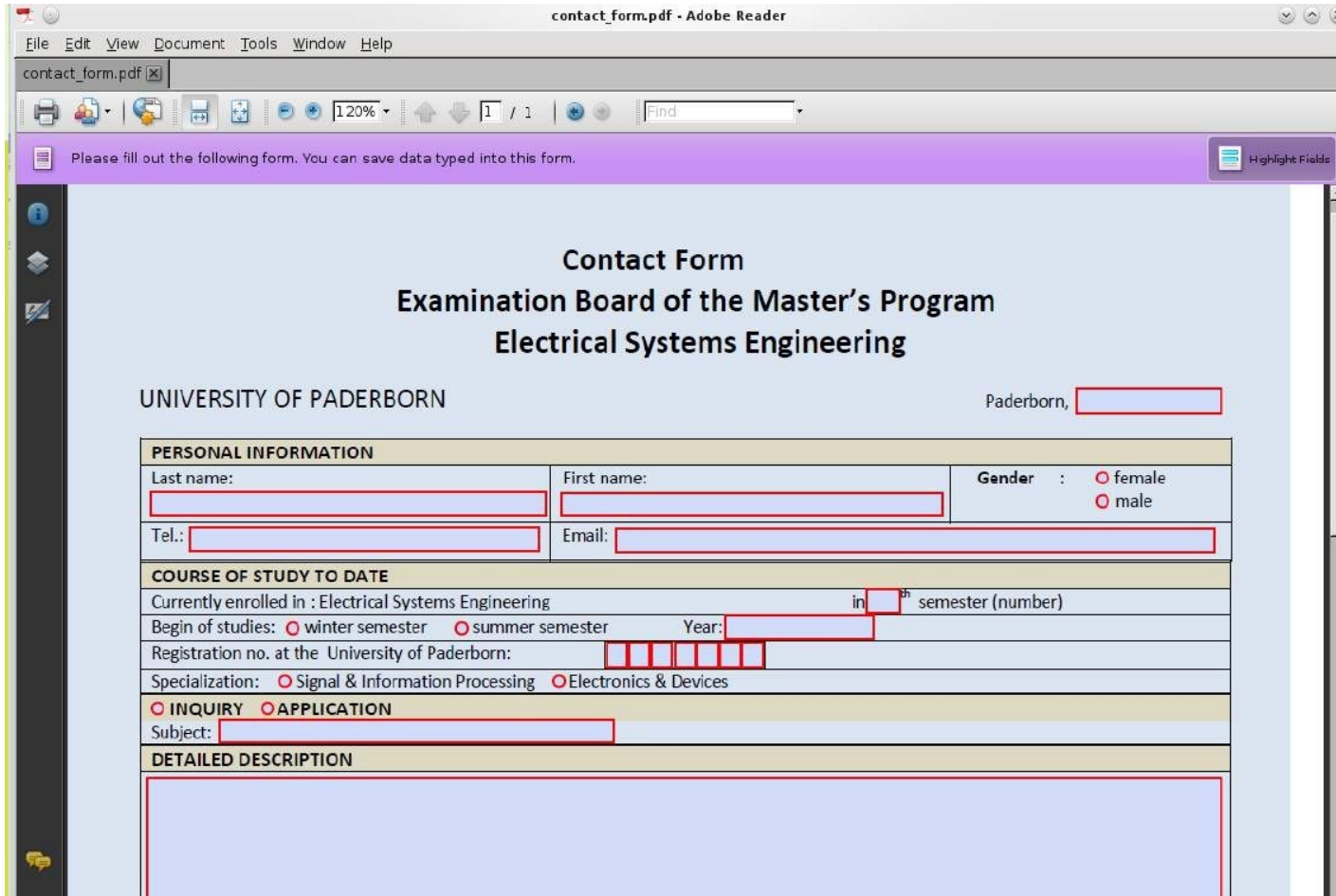
Use the contact form and add your current Transcript of records.

You can find it at: go.upb.de/ease_contact_form



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Good to Know...



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Please fill out the following form. You can save data typed into this form. Highlight Fields

Contact Form
Examination Board of the Master's Program
Electrical Systems Engineering

UNIVERSITY OF PADERBORN Paderborn,

PERSONAL INFORMATION		
Last name: <input type="text"/>	First name: <input type="text"/>	Gender : <input type="radio"/> female <input type="radio"/> male
Tel.: <input type="text"/>	Email: <input type="text"/>	

COURSE OF STUDY TO DATE	
Currently enrolled in : Electrical Systems Engineering	in <input type="text"/> th semester (number)
Begin of studies: <input type="radio"/> winter semester <input type="radio"/> summer semester	Year: <input type="text"/>
Registration no. at the University of Paderborn:	<input type="text"/>
Specialization: <input type="radio"/> Signal & Information Processing <input type="radio"/> Electronics & Devices	

INQUIRY APPLICATION

Subject:

DETAILED DESCRIPTION
<input type="text"/>



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Some Important Deadlines

- **Enrollment** for the current semester until **April 23**.
- **Registration** for courses in PAUL until **April 30**.
- **Deregistration** for courses in PAUL until **June 30**.
- **Registration** for examinations in PAUL from **April 22** until **May 26**.
- **Deregistration** for examinations in PAUL until **2 days before exam date**.

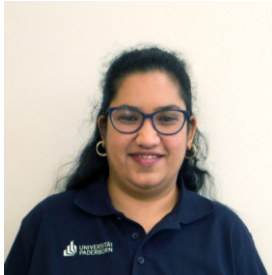
<https://www.uni-paderborn.de/en/studies/paul-information-sites/deadlines-and-dates>



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Advisory Service for Students in Master ESE

Specialized Counseling



Shwetha Ganesh

Office: P1.3.38

Phone: 05251 60-3202

✉: studienberatung@ei.upb.de

ESE Office Hours:

Tue: 09:00 - 12:00

Thu: 13:00 - 16:00

Advisors



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- Modules
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Any questions?

Thank you for your attention

