

# Course Manual SNT

Switch-Mode Power Supplies

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## – General information

**Long name** Switch-Mode Power Supplies

**Approving CModule** [SN BaET](#)

**Responsible** Prof. Dr. Christian Dick  
Professor Fakultät IME

**Valid from** summer semester 2023

**Level** Bachelor

**Semester in the year** summer semester

**Duration** Semester

**Hours in self-study** 60

**ECTS** 5

**Professors** Prof. Dr. Christian Dick  
Professor Fakultät IME

**Requirements** Successful participation in the module power electronics

**Language** German, English if necessary

**Separate final exam** Yes

## Literature

Online Simulationstool der ETH Zürich:  
<https://www.ipes.ethz.ch>

## Final exam

### Details

It is planned to conduct the summary examination as an oral examination, in individual cases with a high number of candidates also a written examination. The examination ensures that each student has achieved the goals of the L.O. individually.

55% of this summary examination is included in the overall grade. The remaining 45% weighting consists of an assessed internship, which does not take place every semester.

### Minimum standard

Sound explanation of the function of diverse converters

**Exam Type**

EN mündliche Prüfung,  
strukturierte Befragung

## – Lecture / Exercises

### Learning goals

Goal type	Description
Knowledge	Flow converter, flyback converter, push-pull converter, resonant converters, soft switching, EMI and filtering
Skills	Independent familiarisation with topics that are assigned as tasks  Analysis and evaluation of RF circuits incl. interference emissions and filtering  Magnetic Circuit Design

### Special requirements

none

### Accompanying material

Simulation Tool

### Separate exam

No

### Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	2
Exercises (whole course)	1
Exercises (shared course)	0
Tutorial (voluntary)	0

## – Practical training

### Learning goals

Goal type	Description
Knowledge	The following topologies can be analysed, described, evaluated, constructed, put into operation and measured by the students (in lab probably 3 out of 4 Topologies):  buck converter with focus on inductance  flyback converter  push-pull converter  series-resonant converter

### Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	2
Tutorial (voluntary)	0

### Special requirements

none

### Accompanying material

Lab documents, Internet (Students must find the necessary documents to show self-dependent way of working)

### Separate exam

Yes

### Separate exam

#### Exam Type

undefined

#### Details

The students work independently and consciously with few specifications / instructions on the construction of converters. In a detailed discussion with the lecturer, the students explain the steps and effects.

#### Minimum standard

The students are able to describe the function of the assembled circuits in a valid way, the circuits function in the laboratory setup.