## § 41 Master's Program Electrical Engineering and Embedded Systems

### (1) Consecutive study

The consecutive Master's program of Electrical Engineering and Embedded Systems comprises three semesters and has been designed especially for graduates of electrical engineering and computer science programs having at least a Bachelor or a Diplom degree. The curriculum for the Master's program Electrical Engineering and Embedded Systems is shown in tables 1 and 2a or 2b.

There are two course specializations possible:

- System-On-Chip Design & Operation (table 2a) and
- Sensor Data Processing (table 2b).

Students choose one of these.

One elective course has been scheduled for the second semester (EMM2). At the beginning of the lecture period (no later than three weeks after lecture start), the Examination Board will publish the permissible elective subjects with a notice on the bulletin board. Students may also do a research project work in one of the university's laboratories as the elective course in the second semester (EMM2). The third semester (EMM3) shall be dedicated primarily to the completion of the Master's thesis.

### (2) Scope of the study program

Courses as well as related course achievements and accredited examinations corresponding to at least 90 ECTS are required for successful graduation from the consecutive study program. ECTS are earned according to tables 1 and 2a or 2b.

### (3) Language of instruction

Courses are offered in the English language.

### (4) Participation, performance records and examinations

The modules required for successful completion, along with the corresponding coursework and examinations, are listed in Tables 1–3 below.

To be permitted to begin the master's thesis, students must have completed at least 50 ECTS credits from the first two semesters of study, as specified in Table 1.

The following abbreviations are used in Table 1:

| Type of course | | Type of exam | | Scope of exam | |
|---|---|---|---|---|---|
| **V** | Lecture | **MT** | Master´s thesis | **SWS** | Semester hours |
| **P** | Laboratory / practical course | **PF** | Portfolio | **ECTS** | ECTS points in compliance with the European Credit Transfer System |
| **PR** | Project work | **K(xx)** | Written test with a duration of xx minutes | | |
| **S** | Seminar | **M** | Oral examination | | |
| | | **R** | Seminar Paper and presentation | | |
| | | **PA** | Practical work (lab, term paper, exercise or seminar paper) | | |
| | | **RPA** | Practical work documented by a seminar paper and presentation (50% PA graded and 50% R graded) | | |

For tutorials held by the student, the corresponding ECTS earned may not exceed a total of 5 ECTS. In case of doubt the responsible examination committee will decide upon the number of ECTS to be granted.

## (5) Master's Thesis

The Master's thesis can only be commenced if mandatory courses and related coursework have been completed with at least 45 ECTS points. The Master's thesis shall have a duration of 6 months.

Amendment to § 10 (9) of the "General Part of this Study and Examination Regulations": Second examiner can also be a scientific assistant, who has been conferred upon the authority to examine, according to legal regulations.

After completion of the Master's thesis, the results shall be presented at Hochschule Ravensburg-Weingarten - University of Applied Sciences, in an event open to all members of the university.

## (6) Master's Certificate

The Master's certificate will be issued in the English language. The certificate will show all module examinations passed as per tables 1 and 2a or 2b, as well as the Master's thesis. Upon application, additional modules can be included in the Master's certificate, however without being taken into account for the calculation of the overall grade.

## (7) Overall grade

The module examinations passed as well as the Master's thesis will be entered into the calculation of the average grade, weighted according to the ECTS points earned.

## (8) Validity

This SPO is valid starting from summer semester 2025.

## **Table 1:** Master's Program Electrical Engineering and Embedded Systems

| **Module** | **Course** | **Curricular semester assigned** | | | | **Accredited examination** |
|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | |
| | | Type | ECTS/ SWS | ECTS/ SWS | ECTS/ SWS | |
| Applied Mathematics | Applied Mathematics | V+P | 5/4 | | | K90 or PF |
| Numerical Methods | Numerical Methods | V+P | 5/4 | | | K90 or PF |
| Embedded Computing 1 | Embedded Computing | V | 5/4 | | | PF |
| Embedded Computing 2 | Embedded Computing Lab | P (2 SWS) | | 4/4 | | PF |
| | Embedded Computing Project | PR (2 SWS) | | | | |
| Signal Processing 1 | Sensor and Actuator Signals | V+P | 5/4 | | | K90 |
| Communications 1 | Nearfield Communication | V+P | 5/4 | | | K90 |
| Communications 2 | Wireless Communication | V+P | | 5/4 | | K90 |
| Advanced Control Systems | Advanced Control Systems | V (4 SWS) | | 6/6 | | K90* |
| | Advanced Control Systems Lab | P (2 SWS) | | | | |
| Profile 1 | (see table 2a and b) | | 5/4 | | | |
| Profile 2 | (see table 2a and b) | | | 5/4 | | |
| Profile 3 | (see table 2a and b) | | | 5/4 | | |
| Elective | | | | 5/x | | |
| Embedded Control | Embedded Control Seminar | S (2 SWS) | | | 5/4 | RPA |
| | Embedded Control Lab | P (2 SWS) | | | | |
| Master'sThesis | Master's Thesis with Colloquium 20 % | | | | 25 | MT + R |
| **Summary ECTS / SWS** | | | **30/24** | **30/22+x** | **30/4** | |

** Lab attendance documented by not graded lab report is required for admission to exam.*

**Table 2a:** Master Program Electrical Engineering and Embedded Systems
Profile - System-On-Chip Design & Operation

| Module | Course | Curricular semester assigned | | | | Accredited examination |
|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | |
| | | Type | ECTS/SWS | ECTS/SWS | ECTS/SWS | |
| Circuits & Systems 1 | System-On-Chip Modeling & Design | V+P | 5/4 | | | PF |
| Circuits & Systems 2 | System-On-Chip Operation & Test | V+P | | 5/4 | | PF |
| Computer Architecture | Computer Architecture | V+P | | 5/4 | | PF |

**Table 2b:** Master Program Electrical Engineering and Embedded Systems
Profile – Sensor Data Processing

| Module | Course | Curricular semester assigned | | | | Accredited examination |
|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | |
| | | Type | ECTS/SWS | ECTS/SWS | ECTS/SWS | |
| Computer Vision | Computer Vision | V+P | 5/4 | | | PF |
| Lidar and Radar Systems | Lidar and Radar Systems | V+P | | 5/4 | | PF |
| Signal Processing 2 | Digital Filters | V+P | | 5/4 | | RPA |