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**§ 66  
Degree Program  
Sustainable Engineering and Future Technologies  
(SET)**

**(1) Intended Learning Outcomes**

The Sustainable Engineering and Future Technologies (SET) degree program teaches fundamental engineering skills and a basic understanding of the necessity and implementation of sustainable technology and processes. In addition, in-depth engineering knowledge in future-relevant topics will be taught. Students can choose between different specializations that are continuously adapted to current technological and social issues.

The degree program prepares the student for the international labor market with a focus on Germany and is designed for both German and foreign applicants. English is a prerequisite, see section (4) of the Admission statutes for the study program SET, and additional language skills will be acquired, especially German proficiency for non-native speakers.

**(2) Pre-Degree Internship**

No pre-degree internship is required in the SET degree program.

**(3) Curriculum Outline**

The degree program is divided into foundational studies and the main studies. The duration of the foundational studies is two semesters, the duration of the main course of studies is five semesters. The integrated internship semester takes place in the fourth semester and can be postponed upon request, see paragraph (6). From the fifth semester onward, areas of specialization are offered, see paragraph (7).

**(4) Required Coursework**

The SET degree program is a full-time degree program. The regular period of study is seven semesters. The total number of compulsory, specialization and elective modules required to successfully complete the degree program amounts to 210 ECTS points. The subjects as well as the module and/or submodule exams can be found in the Study Program and Exam Plan (paragraph 23).

**(5) Assessment Semester**

There are no regulations that go beyond the rules laid out in § 2 para. 3 and § 18 para. 2 in the General part of the Study and Examination Regulations for the Bachelor's Degree Programs (SPOBa).

**(6) Integrated Internship Semester (PSS)**

In accordance with the regulations in § 8 of the General Part of the SPOBa, the training in an integrated internship semester takes place in a suitable institution of professional practices for a duration of at least 95 days of attendance. In addition, block courses will be held in Module 19 on a separate schedule to prepare and follow up on the integrated internship semester.

The PSS is planned for the fourth semester. Upon request, the PSS may be completed in the fifth or sixth semester. The dean of studies decides on the application.

Admission to the PSS is possible once admission to main studies has been given.

**(7) Areas of Specialization**

There are five areas of specialization: "Energy Science and Technology", "Sustainable Mobility", "Environmental Engineering", "Data Based Engineering", and "Robotics and Cyberphysical Systems".

One of the five areas of specialization must be chosen by the beginning of the fifth semester. The area of specialization will form a module group. A catalog of possible specialization modules will be published for each of the specializations.

The Program Development Committee regularly proposes suitable module combinations for the various areas of specialization.

Overall, modules with a total of at least 25 ECTS points must be included in each area of specialization.

The selection must contain a minimum of four modules (depending on the size of each module) and a maximum of seven modules.

At the beginning of each semester, a binding agreement for the selection will be entered with the dean of studies for the respective semester.

#### **(8) Elective Courses**

In the module group "Elective courses", students can freely choose modules from a catalog of elective courses. This area of the curriculum allows the students to supplement their competence profile from a selection of modules of their choice. As long as the selection is made from the electives catalog of the SET degree program, approval by the dean of studies is not required, unlike in the areas of specialization. The selection of modules that are not included in the electives catalog of the SET degree program must be approved by the dean of studies.

The electives catalog of the SET degree program is published at the beginning of each semester. Registration for the module or sub-module exams of the elective modules are carried out in accordance with § 14 para. 1 General part of the SPOBa at the Central Examination Office. If a module exam has not been passed, a repeat of the exam is mandatory.

#### **(9) Extracurricular studies (Studium generale)**

In Module 52, non-technical subjects with four ECTS credits must be selected from the offer of the Studium generale of the university and a proof of performance as specified for the selected courses must be provided.

#### **(10) Language Modules**

With language modules 1 and 7, students whose mother tongue is not German can acquire language skills up to the B1 level.

German native speakers or students who have acquired the university entrance qualification at a German-speaking institution must select language modules with the same ECTS credits in an alternative language, for example from the offer of the Studium generale, that is not German or their respective mother tongue and provide a proof of performance.

#### **(11) Teaching and Exam Languages**

Courses are usually taught in English. Some compulsory courses are held in German to foster integrated language acquisition. Both English and German-language courses can be chosen in the areas of specialization and in the area of compulsory electives.

In the Study Program and Exam Plan, English-language courses are marked with (EN), and German-language courses accordingly with (DE). The exams are taken in the language of instruction.

The bachelor's thesis can be written in either German or English.

#### **(12) Subject-Related Admission Requirements for the Module and/or Submodule Exams**

In addition to the regulations in § 14 para. 2 in the General part of the SPOBa applies: Admission to the examinations for the main studies may also be granted upon application in justified exceptional cases, if a maximum of four module or submodule examinations of the foundational studies have not yet been completed. The written request, with specified reason, must be submitted to the responsible Examination Board within 14 days of the announcement of the examination results. The decision of the Examination Board will be forwarded with the request to the Office of Student Affairs.

#### **(13) Scheduled Module and/or Submodule Exams**

There are no regulations that supersede the regulations in the General part of the SPOBa. In particular, the regulations in § 3, § 18, § 21 and § 22 General part of SPO Ba apply.

#### **(14) Oral Supplementary Exam**

In the event of a second repeat exam without a passing grade, an oral supplementary examination (M30) in accordance with § 21 para. 4 General part of the SPOBa can be approved by the Examination Board upon request. It shall take place close to the failed second repeat exam. The regulations of § 17 General Part of the SPOBa for oral examinations apply accordingly. The date for the oral supplementary examination will be communicated in an appropriate way.

Passing the supplementary oral examination improves the grade of the second repeat examination to sufficient (4.0). An oral supplementary exam to a second repeat exam is limited to a maximum of two graded module and/or submodule examinations for the entire course of study.

#### **(15) Weighting of Submodule Exams**

Weighting of the graded submodule exams in the calculation of the module grades is proportional to the

number of ECTS points of the associated courses.

#### **(16) Weighting of Module Exams**

In modules for which the pass/fail coursework or the method of module or submodule exam is entered in the row of the module name in the Study Program and Exam Plan (paragraph 23), the following regulation applies: The module exam covers all courses of the module. In accordance with § 26 para. 2 sentence 6 and § 33 para. 2 sentence 4 General part of the SPOBa, the result of a graded module examination is included in the calculation of the overall grade of the bachelor's exam with the weight of the ECTS score allocated to the module in the Study Program and Exam Plan (para. 23).

#### **(17) Types of Courses**

Unless otherwise indicated in the Study Program and Exam Plan (paragraph 23), modules consist of lectures, tutorials, and/or labs (which are often integrated with each other).

#### **(18) Other Written or Practical Exams or Assignments**

Any other written or practical exams or assignments (SP) in accordance with § 15 para. 1 no. 4 i.c.w. § 39 General Part of SPOBa can be:

- B = Other written report,
- L = Lab work, lab report, practical work,
- PR = Presentation,
- S = Term paper, project work,
- W = Workshop.

In the case of other written or practical exams or assignments of types B, L, PR, S and W, the examiner shall determine the scope and time of the required performance at the beginning of the semester in accordance with § 18 para. 3 General part of the SPOBa.

#### **(19) Study Trips**

Study trips can be carried out as part of courses.

#### **(20) Bachelor's Thesis**

In addition to the provisions of § 30 General Part of SPOBa, the following applies: If the prerequisites are not met due to courses that are offered only annually, the Examination Board decides on admission to the bachelor's thesis.

#### **(21) Oral Bachelor's Exam**

An oral bachelor's exam according to § 31 General part of the SPOBa is not planned.

#### **(22) Bachelor Degree**

The Bachelor of Engineering degree (abbreviated: B.Eng.) will be awarded.

A bachelor's degree in engineering, applied technologies or natural sciences entitles you to use the professional title of "engineer" alone or in a combination of words according to the Engineers Act of the state of Baden-Württemberg.

### (23) Study Program and Exam Plan

Foundational Studies (semester 1-2)							Abbreviations see below	
	Module no. / Module / Course			Type of module	Contact hours	ECTS credits	pass/fail coursework	Module or submodule exam
								pass/fail      graded
Semester 1	1	Language Basics (DE)	PM	4	5			K90/S/R
		Language Basics (DE)						
	2	Hands-on Experience (EN/DE)	PM	4	5		L	
		Hands-on Experience (EN/DE)		4	5			
	3	Machine Design and CAD (EN)	PM	4	5			S
		Machine Design and CAD (EN)		4	5	SP		
	4	Mathematics 1 (EN)	PM	4	5			K90
		Mathematics 1 (EN)		4	5			
Semester 2	5	Electrical Engineering (EN)	PM	4	5			K90
		Electrical Engineering including lab (EN)		4	5	SP		
	6	Basic Concepts of Sustainability (EN)	PM	4	5			S
		Basic Concepts of Sustainability (EN)		4	5			
	7	Communication and Intercultural Competences (DE)	PM	4	5		S/R	
		Communication and Intercultural Competences (DE)		4	5			
	8	Physics (EN)	PM	4	5			K90
		Physics including lab (EN)		4	5	SP		
	9	Technical Mechanics (EN)	PM	4	5			K90
		Technical Mechanics (EN)		4	5			
	10	Mathematics 2 (EN)	PM	4	5			K90
		Mathematics 2 (EN)		4	5			
	11	Programming (EN/DE)	PM	4	5			K90
		Programming including lab (EN/DE)		4	5	SP		
	12	Electronics (EN)	PM	4	5			K90
		Electronics including lab (EN)		2	3	SP		
		Electrical Engineering 2 (EN)		2	2			
Sum		Foundational studies (semester 1-2)			48	60		

1) minimum number of ECTS

**Abbreviations:** ECTS = European Credit Transfer System; PM = Compulsory module (Pflichtmodul); WPM = Elective module (Wahlpflichtmodul); DE = German language course; EN = English language course; x = Amount depends on the selected course

**Types of exams:** Kx = Written exam (x = Duration in minutes); Mx = Oral exam (x = Duration in minutes); R = Presentation; L = Lab work, lab report, practical work; PR = Presentation; S = Term paper, project work; W = Workshop; SP = Other written or practical exam / assignment; X = Type of examination depends on the selected course

Main study period (semester 3-7)							Abbreviations see previous page		
	Module no. / Module / Course			Type of module	Contact hours	ECTS credits	Pass/fail coursework	Module or submodule exam	
								pass/fail	graded
Semester 3	13	Process and Material Technologies (EN)		PM	5	5			K90
		Functional Materials (EN)			2	2			
		Functional Materials lab (EN)			1	1	SP		
		Introduction to Process Technologies (EN)			2	2			
	14	Machine Dynamics (EN)		PM	4	5			K90
		Machine Dynamics (EN)			4	5			
	15	Signals and Systems (DE)		PM	4	5			K90
		Signals and Systems including laboratory (DE)			4	5	SP		
	16	Mathematics 3 (EN)		PM	4	5			K90
		Mathematics 3 (EN)							
Semester 4	17	Microprocessor Systems (EN)		PM	4	5			K90/L/R
		Microprocessor Systems (EN)					SP		
	18	Lab Project (DE)		PM	4	5		S	
		Lab Project (DE)			4	5			
	19	Internship		PM	1	30			
		Industrial Internship			0	26		S	
		Seminar			1	4		R	
	20	Control Systems (DE)		PM	4	5			K90
		Control Systems including lab (DE)					SP		
	21	Software Engineering + Object-oriented Programming (EN)		PM	4	5			K90
Semester 5		Software Engineering (EN)			2	2	SP		
		Object-Oriented Programming (EN)			2	3	SP		
	22	Sensors and Drives (EN)		PM	5	5			K90, SP
		Sensors and Data Acquisition (EN)			2	2			
		Electric Drives (EN)			2	2			
		Sensors and Drives lab (EN)			1	1			
	23	Fluid Dynamics and Thermodynamics (DE)		PM	4	5			K90
		Fluid Dynamics and Thermodynamics (DE)			4	5			
	Area of specialization according to para. 7 (modules amounting to at least 25 ECTS credits)				x	25			
	3x	Specialization module 1-7 Course in specialization module		WPM	x x	x x			X
Semester 6	Area of compulsory electives according to para. 8 (modules amounting to at least 10 ECTS credits)				x	10			
	4x	Elective module 1-n Course in elective module		WPM	x x	x x		X	X
	50	Project & Quality Management (EN)		PM	4	5			K90/S/R
		Project and Quality Management (EN)			4	5	S		
Semester 7	51	Scientific Writing (DE)		PM	2	2		S	
		Scientific Writing (DE)			2	2			
	52	Extracurricular Studies <sup>1)</sup>		PM	x	4		SP	
		Selection from Studium generale							
	53	Project		PM	1	12	R		S
	Bachelor Thesis		PM		12				
Sum		Main studies (semester 3-7)			≥50	150			
Sum		Total course of study (semester 1-7)			≥98	210			

