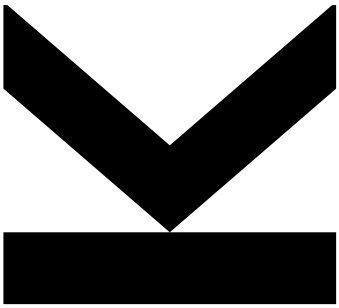
UK 066/479

CURRICULUM FOR THE MASTER'S PROGRAM IN **POLYMER ENGINEERING AND SCIENCE (PES).**



(in English)

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Contents

§ 1 Qualification Profile

(1) The Master's program "Polymer Engineering and Science (PES)" at the Faculty of Engineering and Natural Sciences (TNF) of the Johannes Kepler University Linz (JKU) is based on the Bachelor's program „Nachhaltige Kunststofftechnik und Kreislaufwirtschaft (Sustainable Polymer Engineering & Circular Economy)“ at the JKU and taught in English.

The Master's program "Polymer Engineering and Science (PES)" is supposed to teach and train knowledge, skills, and competences as follows:

- Broad advanced knowledge in the mandatory areas of ”polymer materials and testing“, ”polymer processing“, ”polymer product engineering“, ”polymer chemistry and chemical engineering“, and ”lightweight design/structures“.
- Special expertise in accordance with current science and technology by multiple elective subjects and the active participation in research projects in the context of the Master's Thesis.
- Comprehensive skills in experimental, empirical, and computational methods in manifold aspects of polymer engineering and science.
- Superior competence in problem-solving for polymer engineering and science tasks.
- Experience in interdisciplinary cooperation and communication within an international industrial and scientific environment, particularly supported by a voluntary semester abroad.

(2) Graduates of the Master's program have gained a wide basis in Engineering and Science to perform demanding interdisciplinary professional activities in polymer producing companies, polymer processors, research and development, or management positions. The program opens up excellent career opportunities in enterprises of different size with following orientations - polymers and plastics are used as synonyms here:

- the plastics industry as a whole (polymer manufacturers and plastics processors, suppliers of plastics processing machinery),
- the entire spectrum of industry using plastics products, in particular automotive, aeronautical, electrical, medical engineering, building, infrastructure, and energy technologies, sports- and leisure, and packaging,
- plastics engineering & technical services like engineering offices or technology transfer centers,
- private and public research institutions,
- regional, national, and international supervisory authorities and agencies.

(3) Graduates of the Master's program are able to work in companies with international clients and in intercultural teams. They contribute significantly to the development and application of polymer technologies both in industry and research. They can flexibly adapt to changing market requirements and new scientific and technological developments in the fields of polymer engineering and science. By combining highly complementary technical and scientific courses, graduates are prepared to push new insights and novel approaches to current and future challenges in industry, business, and research.

§ 2 Admissions

(1) In accordance with § 54 para. 1 UG the Master's program "Polymer Engineering and Science" belongs to the category of engineering degrees and is taught in English.

(2) The Master's program "Polymer Engineering and Science" is based on the Bachelor's program "Nachhaltige Kunststofftechnik und Kreislaufwirtschaft (Sustainable Polymer Engineering & Circular Economy)" (UK033/220) at JKU. Graduates of this Bachelor's program are admitted to the Master's program without any restrictions.

(3) Equally eligible for admission to the Master's program are the Bachelor's programs "Maschinenbau (Mechanical Engineering)" (UK 033/245) and "Medical Engineering" (UK 033/254) at the JKU, whereby graduates of these programs must complete the bridge subject for graduates of the Bachelor's program Mechanical Engineering (Maschinenbau) or the bridge subject for graduates of the Bachelor's program Medical Engineering as part of the Elective Subjects, respectively.

(4) Graduates of Bachelor's programs or related programs of at least the same level of higher education at recognized national or international post-secondary educational institutions can be admitted to the Master's program provided that such a degree program essentially provides the same qualifications as the Bachelor's program "Nachhaltige Kunststofftechnik und Kreislaufwirtschaft (Sustainable Polymer Engineering & Circular Economy)" or the Bachelor's program "Maschinenbau (Mechanical Engineering)" or the Bachelor's program "Medical Engineering" at the JKU. In the case of admission pursuant to para. 4, it must be determined at the time of admission to which of the above-mentioned degree programs the completed degree program is related to or whether the provisions for graduates of the Bachelor's program "Maschinenbau (Mechanical Engineering)" or "Medical Engineering" are to be applied as an alternative to the provisions for graduates of the Bachelor's program in "Nachhaltige Kunststofftechnik und Kreislaufwirtschaft (Sustainable Polymer Engineering & Circular Economy)".

(5) In order to compensate for significant subject-related differences, supplementary examinations amounting to a maximum of 40 ECTS credits may be prescribed, which must be taken by the end of the second semester of the Master's program.

§ 3 Structure and Outline

(1) The Master's program "Polymer Engineering and Science" covers 4 semesters and consists of 120 ECTS points, which are distributed among the following subjects:

Subjects	**ECTS**
Mandatory Subjects	63
Elective Subjects	18
Master's Thesis (incl. Master's Thesis Seminar)	25
Master's Examination	2
Free Electives	12
Total	120

(2) For Free Electives, students have to pass examinations corresponding to 12 ECTS points, which can be chosen from any recognized national or international post-secondary educational institution. The Free Electives shall provide additional skills beyond "Polymer Engineering and Science" and can be taken anytime during the Master's study.

(3) The recommended course of study is shown in annex 1 or in annex 2 for graduates of the Bachelor's programs Maschinenbau (Mechanical Engineering) or Medical Engineering, respectively. This recommendation is based on the requirements of a full-time degree program. However, taking program restrictions into account, the program can also be completed by those who have a flexible work schedule or family care responsibilities: Some courses are also offered remotely and although attendance is usually not mandatory, attendance is recommended. In other courses, attendance is usually mandatory; however, attempts are made to offer multiple courses at alternative times and/or remotely. In regard to exams, there is no guarantee that they can be held remotely or during off-peek hours. Depending on the extent of work flexibility and/or family care responsibilities, a longer period of studies is to be expected.

§ 4 Compulsory Subjects/Modules

The following Mandatory Subjects have to be completed successfully:

Code	Name	ECTS
479POMT19	Polymeric Materials and Testing	17
479POPE14	Polymer Product Engineering	16.5
479POPR14	Polymer Processing	17.5
479SAFK24	Scientific and Future Skills	12

§ 5 Elective Subjects/Modules

(1) Courses amounting to 18 ECTS credits must be completed as part of the Elective Subjects.

Code	Name	ECTS
479ELTR24	Elective Track	18
479BRSU24	Bridge Subjects	18

(2) The subject "Elective Track" is divided into the following Elective Subjects:

Code	Name	ECTS
479SMDS24	System Monitoring and Data Science	9
479CACT12	Chemistry and Chemical Technology	9
479PMMS12	Physics of Materials and Materials Science	9
479PTAM12	Process Technologies and Modelling	9
479COES12	Computational Engineering	9
479AMME12	Mechanical Design and Engineering	9
479MABA12	Management and Business Administration	9
479PISD12	Polymer Industry and Sustainable Development	9

(3) Two Elective Subjects, each worth 9 ECTS credits, must be completed. Students can select only courses which they have not already completed as part of the Bachelor's program that qualified them for this Master's program.

(4) The subject "Bridge Subjects" is divided into the following subjects:

Code	Name	ECTS
479BRME24	Bridge Subject for Graduates of the Bachelor's Program Medical Engineering	18
479BRMB24	Bridge Subject for Graduates of the Bachelor's Program Mechanical Engineering (Maschinenbau)	18

(5) In deviation from para. 3, graduates of the Bachelor's programs "Maschinenbau (Mechanical Engineering)" or "Medical Engineering" must complete the Bridge Subject for graduates of the Bachelor's program Mechanical Engineering (Maschinenbau) or the Bridge Subject for graduates of the Bachelor's program Medical Engineering to the extent of 18 ECTS credits, respectively. If courses from the Bridge Subject have already been completed as part of the degree program on which admission is based, any courses from the Elective Subjects according to para. 2 must be chosen in the corresponding ECTS amount.

§ 6 Courses

(1) The names and the types of all courses of the Mandatory Subjects and Elective Subjects, as well as their ECTS credits, their duration in hours per week, their codes, their registration requirements, and their admission procedures (in case of limited availability of places) are described in the study handbook of JKU (www.studienhandbuch.jku.at).

(2) The possible types of courses as well as the examination regulations are described in §§ 13 and 14 of the JKU statute (Section "Studienrecht").

§ 7 Replacement of Subjects and Courses

Mandatory Subjects and Elective Subjects according to §§ 4 and 5 as well as courses according to § 6 para. 1 may be replaced to a total extent of 18 ECTS credits by other study specific subjects and courses upon student's request, provided that the purpose of academic professional preparatory training is not affected and the choice of the proposed subjects and courses seems reasonable with regard to the defined aims in the qualification profile, to the academic context as well as to the addition to the professional preparatory training. The application of replacing subjects and courses has to be filed by the Vice Rector of Academic Affairs.

§ 8 Master’s Thesis

(1) Students of the Master’s program "Polymer Engineering and Science" must complete a Master’s Thesis according to § 81 UG and § 36 of the JKU statute (Section "Studienrecht").

(2) The Master’s Thesis is a written paper work corresponding to an effort of 24 ECTS credits.

(3) The Master’s Thesis serves as a proof that graduates are able to perform scientific work autonomously and systematically. The topic of the thesis must be taken from the Mandatory Subjects with the exception of the subject "Scientific and Future Skills" and must permit completion within a period of 6 months.

(4) The Curricular Committee may specify guidelines for the formal structure of a Master’s Thesis.

(5) Subject to agreement with Academic Advisor, the Master’s Thesis can be submitted in English or German.

(6) Prerequisite for the registration of the Master’s Thesis is the successful completion of at least 30 ECTS credits from the Mandatory Subjects according to § 4.

(7) In addition to the Master’s Thesis, students must pass the Master’s Thesis Seminar with 1 ECTS credit.

§ 9 Examination Regulations

(1) The regulations for subject examinations and course examinations are described in the study handbook of the JKU.

(2) The Master’s Program "Polymer Engineering and Science" is concluded by a Master’s examination.

(3) The Master’s examination consists of two parts: The first part is the successful completion of the Mandatory Subjects and Elective Subjects according to §§ 4 and 5.

(4) The second part of the Master’s examination is a comprehensive oral exam (2 ECTS credits) conducted by an examination committee. Prior to being admitted to the Master’s examination, students must complete the first part of the Master’s examination, the Master’s Thesis, the Master’s Thesis Seminar and the Free Electives.

(5) The second part of the Master’s examination starts with a presentation and a defence of the Master’s Thesis, followed by two oral exams. One of the exams concerns the subject defined by the advisor of the Master’s Thesis, the second exam must be chosen by the candidate out of the Mandatory Subjects listed in § 4 with the exception of the subject "Scientific and Future Skills".

(6) The examination committee consists of three members and is formed by the Vice Rector of Academic Affairs. The candidate may submit a proposal for the committee members. In general, the Academic Advisor of the Master’s Thesis is a member of the examination committee. The head of the committee suggests the assessment of the presentation and the defence of the thesis. The other two examiners suggest the assessment of the examinations in their subjects, respectively.

§ 10 Academic Degree

(1) Graduates of the Master's program "Polymer Engineering and Science" are awarded the academic degree „Diplom-Ingenieurin/Diplom-Ingenieur“, abbreviated „Dipl.-Ing.“ or „Dipl.-Ing. (JKU)“ or „DI" or „DI (JKU)“.

(2) The certificate proving the academic degree is issued in German and in English translation.

§ 11 Legal Validity

(1) This Curriculum comes into effect on October 1, 2024.

(2) The curriculum of the Master's program “Polymer Technologies and Science” in the version published in the official newsletter of Johannes Kepler University Linz on May 23, 2023, 23rd piece, item 400, expires by the end of September 30, 2024, unless otherwise specified below. Transitional provisions shall remain in force as long as they still apply in scope and content.

(3) § 12 para. 3 as published in the official newsletter of the Johannes Kepler University Linz on May 6, 2025, 22nd piece, item 250 will take effect on October 1, 2025.

§ 12 Transitional Provisions

(1) The equivalences given in the study handbook of JKU are effective for students who did examinations within the Master's program "Polymer Technologies and Science".

(2) Course examinations that were passed before October 1, 2024, as part of the curriculum for the Master's program "Polymer Technologies and Science" in the Elective Subjects are considered as course examinations of the corresponding Elective Subject according to the following table:

Subjects Master's program Polymer Technologies and Science 2023	**Subjects Master's program Polymer Engineering and Science 2024**
Chemistry and Chemical Technology	Chemistry and Chemical Technology
Physics of Materials and Materials Science	Physics of Materials and Materials Science
Process Technologies and Modelling	Process Technologies and Modelling
Computational Engineering Sciences	Computational Engineering
Applied Mechanics and Mechanical Engineering	Mechanical Design and Engineering
Management and Business Administration	Management and Business Administration
Polymer Industry and Sustainable Development	Polymer Industry and Sustainable Development
Soft Skills	Soft Skills

(3) Credits earned before September 30, 2024, for course examinations of the Elective Track of the curriculum for the Master's program "Polymer Technologies and Science" 2023, that cannot be used to complete an elective subject according to § 5 para. 2 and 3 can be counted towards the subject "Scientific and Future Skills” or any other “Elective subject”.

(4) In addition, the following equivalence table applies:

Subjects Master's program Polymer Technologies and Science 2023	**equivalent subject Master's program Polymer Engineering and Science 2024**
479ELTR19: Elective Track (30 ECTS)	479ELTR24: Elective Track (18 ECTS) + 479SAFK24: Scientific and Future Skills (12 ECTS)

Global map of study subjects - Master's Program "Polymer Engineering and Science" (2024)

for Graduates of Bachelor's program "Nachhaltige Kunststofftechnik und Kreislaufwirtschaft"

1st Semester (WS)		2nd Semester (SS)		3rd Semester (WS)		4th Semester (SS)	
Subject/Course	**ECTS**	**Subject/Course**	**ECTS**	**Subject/Course**	**ECTS**	**Subject/Course**	**ECTS**
Polymeric Materials and Testing VL Industrial Chemistry for Plastic Engineering PR Characterization and Testing of Polymeric Materials 2 VL Plastics Recycling - From Waste Management and Processing to Performance	8,5	**Polymeric Materials and Testing** VL Physical Chemistry of Surfaces and Interfaces VL Chemical Interactions in Polymers VL Polymeric Materials 3: Polymer Mechanics and Fracture Mechanics VL+SE Polymeric Materials 4: Functional Polymeric Materials	8,5				
Polymer Product Engineering KV Mechanical Material Models for Polymers KV Design of Lightweight Structures UE Structural Durability Calculations	7,5	**Polymer Product Engineering** VL Polymer Product Design and Engineering 4: Integrated Injection Moulding, Micromechanics and Structure Simulation UE Polymer Product Design and Engineering 4: Integrated Injection Moulding, Micromechanics and Structure Simulation VL+UE Lightweight Design with Composite Materials	9	**Elective Track**	12	**Master's Thesis**	24
Polymer Processing VL Polymer Injection Moulding 1: Machine Engineering KV Polymer Injection Moulding 2: Process Technologies VL+UE Polymer Extrusion and Compounding 1: Process Technologies	10,5	**Polymer Processing** VL+UE Polymer Extrusion and Compounding 2: Modelling Screw Extrusion PR Polymer Processing	7	**Free Electives**	9		
Free Electives	3	**Elective Track**	6	**Scientific and Future Skills**	9	**Master's Thesis Seminar/ Master's Examination**	3
						Scientific and Future Skills	3
	29,5		**30,5**		**30**		**30**

Total: 120,00

Global map of study subjects - Master's Program "Polymer Engineering and Science" (2024)

for Graduates of Bachelor programs "Maschinenbau (Mechanical Engineering)" or "Medical Engineering"

1st Semester (WS)		2nd Semester (SS)		3rd Semester (WS)		4th Semester (SS)	
Subject/Course	**ECTS**	**Subject/Course**	**ECTS**	**Subject/Course**	**ECTS**	**Subject/Course**	**ECTS**
Polymeric Materials and Testing VL Industrial Chemistry for Plastic Engineering PR Characterization and Testing of Polymeric Materials 2	5,5	**Polymeric Materials and Testing** VL Physical Chemistry of Surfaces and Interfaces VL Chemical Interactions in Polymers VL Polymeric Materials 3: Polymer Mechanics and Fracture Mechanics VL+SE Polymeric Materials 4: Functional Polymeric Materials	8,5	**Polymeric Materials and Testing** VL Plastics Recycling - From Waste Management and Processing to Performance	3		
Polymer Product Engineering KV Mechanical Material Models for Polymers KV Design of Lightweight Structures UE Structural Durability Calculations	7,5	**Polymer Product Engineering** VL Polymer Product Design and Engineering 4: Integrated Injection Moulding, Micromechanics and Structure Simulation UE Polymer Product Design and Engineering 4: Integrated Injection Moulding, Micromechanics and Structure Simulation VL+UE Lightweight Design with Composite Materials	9	**Scientific and Future Skills**	9	**Master's Thesis**	24
Polymer Processing VL+UE Polymer Extrusion and Compounding 1: Process Technologies	4,5	**Polymer Processing** VL+UE Polymer Extrusion and Compounding 2: Modelling Screw Extrusion PR Polymer Processing	7	**Polymer Processing** VL Polymer Injection Moulding 1: Machine Engineering KV Polymer Injection Moulding 2: Process Technologies	6		
Electives Bridge Subject	12	**Electives Bridge Subject**	6	**Free Electives**	12	**Master's Thesis Seminar/ Master's Examination**	3
						Scientific and Future Skills	3
	29,5		**30,5**		**30**		**30**

Total: 120