

**Study and Examination Regulations for the
Master's Degree Programme
Applied AI for Digital Production Management, M.Eng.
at
Deggendorf Institute of Technology
of 12 April 2023**

Based on Art. 13(2) Sentence 2, 58(1), 61(2) Sentence 1 of the Bavarian Higher Education Act (BayHSchG) of 23 May 2006 (GVBl. p. 245, Bay RS 2210-1-1-WK), last amended by Section 132(1) of the Act adopted on 5 August 2022 (GVBl. p. 414), Deggendorf Institute of Technology hereby enacts the following by-laws:

Section 1

Aim of the study programme

- (1) The master's degree programme in "Applied AI for Digital Production Management" is designed to enable graduates of *Diplom* or bachelor's programmes to substantiate the knowledge that they have acquired so far with theoretical knowledge, and thereby be particularly well-equipped to meet the requirements posed by tasks in modern research and development. The degree programme is primarily designed for undergraduates holding a *Diplom* or bachelor's degree in industrial engineering, production engineering and/or mechatronics.
- (2) ¹The programme builds on the knowledge acquired during their *Diplom* or bachelor's programme and deepens their understanding of subject-specific content. ²Through this approach, graduates will acquire the ability to work creatively in research and development departments and also to carry out production and management activities in the industrial sector. ³Particularly well-qualified students will furthermore learn the theoretical principles needed for them to pursue a doctoral programme and/or work in scientific fields.

Section 2

Structure of the programme

- (1) The programme comprises three theoretical semesters and is concluded by the master's thesis.
- (2) ¹Lectures are held in English. ²Examinations are written in English.

Section 3

Qualification requirements for the degree programme

(1) To qualify for admission to the master's degree programme Applied AI for Digital Production Management, students must:

- have successfully completed an undergraduate degree programme at an institute of higher education in Germany or abroad and attained at least 210 ECTS credits in the field of industrial engineering, production engineering or mechatronics or a related degree programme, or a degree of comparable standing to one from such an institute of higher education. ²The examination committee shall determine whether the obtained degrees are of comparable standing.

and

- furnish proof of suitability for the programme in question pursuant to Section 5 of these by-laws.

(2) The following language proficiency must be documented for admission to this degree programme:

- Level B2 English proficiency, as defined under the Common European Framework of Reference for Languages.
- Level A2 German proficiency, as defined under the Common European Framework of Reference for Languages.

Regarding the proof, the regulations set out in Section 3 of the general examination regulations for additional qualification in foreign languages and compulsory elective subjects of a general academic nature (AWP) of the Deggendorf Institute of Technology shall apply as amended.

Section 4

Proof ECTS credits not yet obtained

¹Applicants submitting a university degree as proof of qualification for admission, for which fewer than 210 ECTS credits, but at least 180 ECTS credits, have been awarded or which are to be considered as equivalent thereto shall be required to furnish proof of the missing ECTS credits in order to pass their master's examination. ²Missing ECTS credits that need to be submitted by the beginning of the third semester may, further to application to the examination committee, be furnished by completing an additional internship or attending subject-relevant university courses. ³Proof for each variant may be furnished only once. ⁴A maximum of 30 ECTS credits may be provided this way. ⁵The following conditions apply for submission of proof:

1. Internship:

Successful completion of a relevant internship in the field of industrial engineering,

production engineering, mechatronics or a related field of no less than 20 weeks' duration.

2. University lectures and classes:

University lectures and classes must be drawn from the relevant undergraduate degree courses offered at the institute of higher education. The relevant academic advisor is to be consulted in advance, during which time an individualised concept is to be jointly developed with the applicant.

Section 5

Aptitude assessment

- (1) ¹A student's aptitude and suitability for the degree programme is ascertained through a written or online test of 90 minutes' duration. ²The appointment for this examination is set by the examination committee. ³The examination involves complex tasks on relevant subjects relating to advanced mathematics for engineers and fundamental aspects concerning mechatronics, mechanical engineering, and business administration and their applications, as described in detail in, for example, the Module Handbook for the bachelor's programme in Mechatronics and Project Management for Digital Production. ⁴The subject matter covered by the following modules is of relevance: MDP-02 Engineering Mathematics 1, MDP-03 Engineering Mathematics 2, MDP-04 Basics of Physics, MDP-09 Basics of Computer Science, MDP-10 Computer Science 2 as well as MDP-14 Key Qualifications and MDP-17 Company Processes. ⁵The assessment test will be deemed to have been passed if the grade "passed successfully" ("*mit Erfolg abgelegt*") was awarded. ⁶To ascertain a grade, the test is evaluated by two university instructors. ⁷The two examiners jointly set the relevant marking system to be used in order to determine whether the candidate has been successful. ⁸The approaches to solving the tasks must be logical and comprehensible. Both lecturers must reach a consensus when arriving at the test result. ⁹At least one of the two university instructors must teach in one of the relevant degree programmes at Deggendorf Institute of Technology. ¹⁰The university instructors are appointed by the Faculty Council of Applied Natural Sciences and Industrial Engineering.
- (2) ¹The examination committee may waive a candidate's obligation to take the aptitude test for the degree programme if the applicant demonstrates above-average knowledge of the subject matter, as verified through their degree awards falling under Section 3(1) Clause 1. ²Above-average degree awards are deemed to be those demonstrating an overall grade of "good" (<2.5) or better, or above-average knowledge (a grade of 2.5 or better) in Mathematics, Physics, Computer Science and Business Administration or Production Engineering,
- (3) ¹The procedure for determining programme-specific aptitude is conducted every semester. ²The candidates will receive an invitation by e-mail.
- (4) ¹Candidates not passing the aptitude test for the degree programme may

register to reapply to sit the test on the day it is held the following semester.
²In justified cases, a candidate may register for the test at a later juncture.

- (5) ¹Applicants are notified in writing of their written test result. ²The reasons for the candidate not passing the examination must be provided.
- (6) No rights or entitlement to the master's degree programme being offered shall exist in the event of an insufficient number of applicants.

Section 6

Modules and course assessments

- (1) ¹The degree programme comprises modules that may consist of courses on connected subjects. ²ECTS credits are allotted to each module in keeping with the amount of time students are required to invest.
- (2) ¹Compulsory and elective modules, their number of hours, forms of instruction, the examination and the ECTS credits are defined in the appendix to these by-laws. ²The regulations governing subject-specific elective modules are supplemented by the curriculum.
- (3) All courses comprise compulsory modules, compulsory elective modules or voluntary modules:
 - 1. Compulsory modules are mandatory for all students.
 - 2. Compulsory elective modules are offered as alternatives. Students are required to select a certain number of modules based on these study and examination regulations. ³The selected modules will be treated as compulsory modules.
 - 3. Voluntary modules are modules that are not necessarily required in order to achieve the study goals. They may be additionally selected from the courses offered by the Institute.
- (4) ¹No rights or entitlements exist to the envisaged compulsory elective modules or elective modules actually being offered. ²Likewise, no rights or entitlements exist to the related courses being held in the event of insufficient numbers.

Section 7

Curriculum

¹The relevant faculty, currently the Faculty of Applied Natural Sciences, will prepare a curriculum detailing the progression of the degree programme to ensure that the relevant courses are offered and that students are duly informed. ²The curriculum will be determined by the Faculty Council and made public at the Institute prior to the

start of the semester. ³Any amendments or new regulations that need to be announced will be made public no later than at the beginning of the lecture period to which they relate. ⁴In particular, the curriculum will contain regulations and information regarding:

1. the time allocated for the semester hours per week per module and semester, including the attainable ECTS credits;
2. a description of the compulsory and compulsory elective modules plus their number of semester hours per week, the form of instruction, study objectives and the content of the individual modules;
3. the subject-specific compulsory elective modules, including the number of hours involved;
4. the form of instruction used in each individual module, provided that this has not been conclusively specified in the appendix.

Section 8

Assessment of examination performance; overall examination grade

- (1) ¹Each module includes an end-of-module examination. ²Should a module examination comprise multiple module component examinations, a student's module grade will be calculated based on the arithmetic average of their individual examination grades, rounded down to one decimal point. ³The individual examination grades are weighted according to the attainable number of ECTS credits.
- (2) Should a module examination comprise multiple module component examinations, a grade of "insufficient" ("*nicht ausreichend*") awarded in one module component examination may not be offset by a higher grade in another.
- (3) ¹A student's overall grade is calculated using a weighted arithmetic average of their individual grades. ²The weighting of each individual grade equates to the number of ECTS credits allocated to the subject for which the grade was awarded.
- (4) In addition to the overall grade assigned as per para. 3, a relative grade is awarded based on the numerical value attained, in keeping with the ECTS User Guide, as per the provisions of Section 8(6) General Examination Regulations of Deggendorf Institute of Technology.

Section 9

Master's thesis

- (1) ¹Attainment of the master's degree is contingent on a master's thesis being written. ²The aim of the thesis is to enable students to demonstrate, through an independently compiled academic paper, their ability to apply the knowledge and skills acquired during the degree programme to projects relating to engineering practice.
- (2) The time between the topic being assigned and the master's thesis being submitted should be of an adequate duration in light of the scope of the topic and be six months.
- (3) ¹Further to approval by the examination committee, the master's thesis may be written in German. ²It is subsequently to be presented at the Institute; the presentation is taken into consideration when assessing the master's thesis.
- (4) Students wishing to register to write their master's thesis must have attained at least 30 ECTS credits.

Section 10

Certificate

On passing the master's examination, a corresponding certificate is issued in line with the sample shown in the appendix to the General Examination Regulations of Deggendorf Institute of Technology.

Section 11

Academic degree and diploma supplement

- (1) Upon successfully passing the master's examination, the academic degree "Master of Engineering", in short: "M. Eng." is conferred.
- (2) A certificate conferring the awarding of the academic degree will be issued in line with the sample shown in the appendix to the General Examination Regulations of Deggendorf Institute of Technology.
- (3) The certificate will be accompanied by a Diploma Supplement outlining, in particular, the essential course content forming the basis of the degree, the progression of the studies, and the qualification obtained by virtue of the degree.

Section 12
Coming into effect

These Study and Examination Regulations shall come into effect on 1 October 2023.

Appendix 1

to the Study and Examination Regulations for the Master's degree programme
Applied AI for Digital Production Management at Deggendorf Institute of Technology

Overview of modules and courses at Deggendorf Institute of Technology:

M.Eng. Applied AI in Digital Production Management										
Semester periods per week (SWS)										
Overview - module/course no., module and course description, SWS and ECTS credits			Module	1st sem.	2nd sem.	3rd sem.	ECTS	Weighting of module grade	Form of instruction	Exam format
Module No.	Course no.	Module/Course								
MDM-1	MDM1101	Machine Learning and Deep Learning in Production and Logistics	4	4			5		SU/Ü	schrP 90 min
MDM-2	MDM1102	Advanced Statistical Methods & Optimization	4	4			5	5	SU/Ü	schrP 90 min
MDM-3		Data Management	4	4			5			schrP 90 min
	MDM1103	Production Data Management		2				2	SU	
	MDM1104	Application Systems - ERP & MES		2				3	SU	
MDM-4	MDM1105	Production and Logistic Management	4	4			5		SU/Ü	schrP 90 min
MDM-5	MDM1106	Digital Tools in Development and Production	4	4			5		SU/Ü	schrP 90 min
MDM-6	MDM1107	Case Study "AI Project"	4	4			5		Ü	PoP
MDM-7	MDM2101	Technology and Innovation Management	4		4		5		SU/Ü	schrP 90 min
MDM-8		Advanced Intelligent Systems	4		4		5			schrP 90 min
	MDM2102	Big Data Processing & Analytics			2			2	SU	
	MDM2103	Natural Language Processing			2			3	SU	
MDM-9	MDM2104	Case Study Intelligent Systems in Production	4		4		5		Ü	PoP
MDM-10		Digital Production Systems	4		4		5			schrP 90 min
	MDM2105	Cyber-Physical Production Systems & Smart Factory			2			3	SU	
	MDM2106	Simulation of Production Systems			2			2	SU	
MDM-11	MDM2107	Case Study Production Systems	4		4		5		Ü	PoP
MDM-12	MDM2108	Subject-Specific Compulsory Elective (FWP)	4		4		5		SU	The type of examination conducted for elective (FWP) courses is subject to the currently valid study regulations of the course.
MDM-13	MDM3101	Quality & Sustainability	4			4	5		SU/Ü	schrP 90 min
MDM-14		Master's Module					25			
	MDM3102	Master's Thesis						23	MA	
	MDM3103	Master's Colloquium				2		2	S	mdIP 40 min incl. presentation
		Total SWS		24	24	6	90			
		Total ECTS		30	30	30	90			
Abbreviations										
	MA	Master's thesis								
	ECTS	European Credit Transfer System								
	schrP	Written examination								
	PoP	Portfolio assessment								
	Ü	Exercise								
	S	Seminar								
	SU	Seminar-based tuition								
	S	Seminar								
	SWS	Semester hours per week								

Issued based on the decision by the Senate of Deggendorf Institute of Technology on 21 December 2022, the degree programme announcement lodged on 11 April 2023 with the Bavarian State Ministry for Science and Arts and the supervisory approval of the Vice-President of Deggendorf Institute of Technology of 12 April 2023.

Signed
Prof. Waldemar Berg
Vice-President

These by-laws were recorded at Deggendorf Institute of Technology on 12 April 2023. The recorded by-laws were duly posted on the notice boards on 12 April 2023. Their day of announcement is therefore 12 April 2023.