
Prüfungsordnung für die konsekutiven Masterstudiengänge Elektrotechnik/Informationstechnik, Laser- und Plasmatechnik, Präzisionsmaschinenbau und Medizintechnik (Besonderer Teil)

Fakultät Ingenieurwissenschaften und Gesundheit

Die Prüfungsordnung Besonderer Teil für die konsekutiven Masterstudiengänge Elektrotechnik/Informationstechnik, Laser- und Plasmatechnik, Präzisionsmaschinenbau und Medizintechnik vom 2. März 2021 in der Fassung vom 14. Juni 2023 tritt gemäß Fakultätsratsbeschluss vom 14. Juni 2023 der Fakultät Ingenieurwissenschaften und Gesundheit der HAWK Hochschule für angewandte Wissenschaft und Kunst Hildesheim/Holzwinden/Göttingen und Genehmigung des Präsidiums vom 27. Juni 2023 nach ihrer hochschulöffentlichen Bekanntmachung in Kraft. Die hochschulöffentliche Bekanntmachung erfolgte am 12. September 2023.

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§ 1 Dauer und Verlauf des Studiums

- (1) Das Studium beginnt im Winter- oder im Sommersemester. Der Studienablauf ist in der Anlage 3 festgelegt.
- (2) Die Regelstudienzeit beträgt vier Semester in Vollzeit. Das Studium ist teilzeitgeeignet. Einzelheiten zum Teilzeitstudium regelt § 10 der Immatrikulationsordnung.
- (3) Der Gesamtumfang beträgt 120 Leistungspunkte (Credits). Der Anteil der Pflicht- und Wahlpflichtmodule für den jeweiligen Studiengang ist Anlage 3 zu entnehmen.

§ 2 Prüfungs- und Studienleistungen, Prüfungen

- (1) Die Modulprüfungen sowie Art und Anzahl der ihnen zugeordneten Prüfungs- und Studienleistungen, der Prüfungsvorleistungen und die Credits der einzelnen Module sind in der Anlage 3 festgelegt. Benotete Module gehen mit dem Gewicht der Credits in die Gesamtnote ein.
- (2) Die Bearbeitungszeit einer Studienleistung legt die bzw. der Prüfer*in fest, bei Nichtfestlegung gilt eine Bearbeitungsdauer von 13 Wochen.
- (3) Die Prüfungsanforderungen ergeben sich aus den Ausbildungszielen und Inhalten der jeweiligen Modulbeschreibung (siehe Modulhandbücher).
- (4) Die Teilnehmerzahl für bestimmte Lehrveranstaltungen kann in begründeten Ausnahmefällen beschränkt werden, wenn dies im Hinblick auf einen geordneten Studienbetrieb erforderlich ist.
- (5) Bei der Teilnahme an Lehrveranstaltungen haben die Studierenden, für deren Semester die Lehrveranstaltungen vorgesehen sind, und die Wiederholer*innen Vorrang.
- (6) Die Zulassung zu den Prüfungsleistungen setzt neben den Voraussetzungen gemäß § 7 des Allgemeinen Teils der Prüfungsordnung die erbrachten Prüfungsvorleistungen voraus.
- (7) Die Abmeldung von der Prüfung muss spätestens zehn Tage vor der Prüfung von den Studierenden elektronisch erfolgen oder schriftlich der Prüfungsverwaltung mitgeteilt werden. Studierende können sich am Tage der Prüfung vor Beginn der Prüfung bei der bzw. dem Prüfenden persönlich abmelden.
- (9) Ergänzend zu § 15 Absatz 2 der Prüfungsordnung Allgemeiner Teil gilt: Es kann eine einzige bestandene Modulprüfung zum Zwecke der Notenverbesserung einmal zur Wiederholung angemeldet werden; dies gilt nicht für die Abschlussarbeit. Es kann nur eine solche Prüfung wiederholt werden, die im ersten Prüfungsversuch bestanden wurde. Die Wiederholungsprüfung ist in der gleichen Art und Dauer zum nächstmöglichen Prüfungstermin wahrzunehmen. Es gilt die bessere der beiden erreichten Noten. Das Recht, den Notenverbesserungsversuch wahrzunehmen, erlischt bei Bekanntgabe der Note der letzten offenen Modulprüfung. Eine Abmeldung ist nicht möglich.

§ 3 Pflichtmodule, Wahlpflichtmodule, Wahl eines Studienschwerpunktes

- (1) Jeder Studiengang besteht aus Pflicht- und Wahlpflichtmodulen und ggf. aus Wahlpflichtmodulen mit Studienschwerpunktzuordnung (siehe Anlage 3). Die Modulprüfungen der Pflichtmodule werden in jedem Prüfungszeitraum angeboten.
- (2) Die Prüfungskommission legt die Auswahl der Wahlpflichtmodule fest und kann ggf. zusätzliche Wahlpflichtmodule festlegen. Die angebotenen Wahlpflichtmodule werden zu Semesterbeginn in der Prüfungsverwaltung per Aushang sowie elektronisch veröffentlicht. Zusätzlich stehen alle Pflichtmodule anderer Studiengänge gemäß Anlage 3 als Wahlpflichtmodule zur Verfügung.

- (3) Wahlpflichtmodule ohne zugeordneten Studienschwerpunkt können durch maximal zwei Studienarbeiten im Umfang von jeweils drei Credits ersetzt werden.
- (4) Studierende des Masterstudiengangs Elektrotechnik/Informationstechnik müssen zudem Wahlpflichtmodule mit Studienschwerpunktzuordnung im Umfang von 12 Credits einbringen. Werden Wahlpflichtmodule eines Studienschwerpunkts (Automatisierungstechnik oder Ingenieurinformatik) im Umfang von mindestens 12 Credits belegt, so kann der entsprechende Studienschwerpunkt in den Abschlussdokumenten ausgewiesen werden. Hierzu ist der Studienschwerpunkt bei der Anmeldung zur Masterabschlussarbeit anzugeben.
- (5) Wahlpflichtmodule mit zugeordnetem Studienschwerpunkt werden einmal pro Studienjahr angeboten. Ihre Modulprüfungen werden in jedem Prüfungszeitraum angeboten. Abkündigungen dieser Module erfolgen mit mindestens einem Studienjahr Vorlauf.
- (6) Wahlpflichtmodule mit vergleichbaren Prüfungsinhalten dürfen nicht mehrfach belegt werden.
- (7) Module, die an anderen Fakultäten oder Hochschulen erfolgreich absolviert wurden, werden auf Antrag gemäß § 6 der Prüfungsordnung Allgemeiner Teil anerkannt.

§ 4 Masterarbeit und Kolloquium

- (1) Die Zulassung zur Masterabschlussarbeit setzt voraus, dass mindestens 72 Credits erreicht und bis auf das Masterpraxisprojekt alle Studien- und Prüfungsleistungen in den Pflichtmodulen erbracht sind. Sind diese Bedingungen nicht erfüllt, kann die Prüfungskommission im Einzelfall auf begründeten Antrag eine mit Auflagen verbundene Zulassung zur Masterabschlussarbeit aussprechen.
- (2) Dem Antrag auf Zulassung zur Masterabschlussarbeit ist ein Vorschlag für den Themenbereich, dem das Thema der Masterabschlussarbeit entnommen werden soll, beizufügen. Die Abgabe der Arbeit kann frühestens drei und muss spätestens vier Monate nach Ausgabe des Themas erfolgen.
- (3) Weisen Kandidaten zum Abgabezeitpunkt die Annahme eines Manuskriptes als Erstautor*in zur Veröffentlichung bei einer referierten wissenschaftlichen Zeitschrift nach, so können Erst- und Zweitprüfer*in gemeinsam dieses auf Antrag der bzw. des Studierenden als Masterabschlussarbeit gelten lassen.
- (4) Das Kolloquium wird gemeinsam von den Prüfenden der Masterabschlussarbeit als Einzelprüfung oder Gruppenprüfung durchgeführt. Die Dauer des Kolloquiums beträgt in der Regel für jede*n zu Prüfende*n 40 bis 60 Minuten; 20 Minuten davon stehen für einen Vortrag der oder des zu Prüfenden zu den Ergebnissen der Masterabschlussarbeit zur Verfügung.

§ 5 Hochschulgrad, Zeugnis

Die Studiengänge schließen mit der Masterprüfung ab. Nach bestandener Masterprüfung verleiht die Hochschule den Hochschulgrad Master of Engineering (abgekürzt M.Eng.) Darüber stellt die Hochschule eine Urkunde nach Anlage 1 mit dem Datum des Zeugnisses nach Anlage 2 aus. Gleichzeitig mit dem Zeugnis wird den Studierenden ein Diploma Supplement (Anlage 4) ausgehändigt.

§ 6 Inkrafttreten und Übergangsregelungen

- (1) Diese Prüfungsordnung tritt am Tag nach ihrer hochschulöffentlichen Bekanntmachung in Kraft.
- (2) Sie gilt weiterhin für die Studierenden, die zum Wintersemester 2021/22 immatrikuliert wurden. Im Übrigen gilt § 25 Absatz 3 des Allgemeinen Teils der Prüfungsordnung 2021 der Fakultät.

Anlage 1: Modulübersichten

(1) Masterstudiengang Elektrotechnik/Informationstechnik

Modul-Nr.	Modulname	Prüfungsart		Credits/Semester			
		PL	SL	1	2	3	4
Ma 1 -011	Vertiefung Mathematik	K2		6			
Ma 1 -021	Simulation	EA	LP	6			
Ma 1 -043	Übertragungstechnik	K2		6			
Ma 1 -053	Vertiefung der Regelungstechnik	M	LP	6			
	Studienschwerpunkte						
	Wahlpflichtmodule ^(SP) mit Studienschwerpunktzuordnung			6	6		
Ma 2 -043	Softwareengineering	BÜ			6		
Ma 2 -051	Multidimensional Signal Processing	K2			6		
	Wahlpflichtmodule				6	6	
Ma 2 -011	Masterpraxisprojekt	ST			6	6	
Ma 3 -053	Sensorsysteme	K2(80%) + LP(20%)				6	
Ma 3 -042	Webtechnologien	BÜ				6	
Ma 3 -021	Ringvorlesung Qualitätsmanagement	K1(50%) + R(50%)				6	
Ma 4 -011	Masterabschlussarbeit	A + R					28
Ma 4 -011	Kolloquium	KQ					2
	Summe			30	30	30	30

Erläuterungen/Abkürzungen siehe Seite 9.

(2) Masterstudiengang Laser- und Plasmatechnik

Modul-Nr.	Modulname	Prüfungsart		Credits/Semester			
		PL	SL	1	2	3	4
Ma 1 -011	Vertiefung Mathematik	K2		6			
Ma 1 -021	Simulation	EA	LP	6			
Ma 1 -031	Analytische Messmethoden und Mikroskopie	K2		6			
Ma 1 -041	Theoretische Optik	K2		6			
Ma 1 -051	Laser und Plasmen in der Produktion	K1 + EA		6			
Ma 2 -051	Multidimensional Signal Processing	K2			6		
Ma 2 -041	Quantenmechanik	K2			6		
Ma 2 -031	Laser- und Plasmawechselwirkungen	K2			6		
	Wahlpflichtmodule				6	6	
Ma 2 -011	Masterpraxisprojekt	ST			6	6	
Ma 3 -051	Design Optischer Systeme	K2				6	
Ma 3 -041	Vertiefung Fertigungsmesstechnik	BÜ	LP			6	
Ma 3 -021	Ringvorlesung Qualitätsmanagement	K1(50%) + R(50%)				6	
Ma 4 -011	Masterabschlussarbeit	A + R					28
Ma 4 -011	Kolloquium	KQ					2
	Summe			30	30	30	30

Erläuterungen und Abkürzungen siehe Seite 9.

(3) Masterstudiengang Präzisionsmaschinenbau

Modul-Nr.	Modulname	Prüfungsart		Credits/Semester			
		PL	SL	1	2	3	4
Ma 1 -011	Vertiefung Mathematik	K2		6			
Ma 1 -021	Simulation	EA	LP	6			
Ma 1 -032	Maschinenelemente	K2		6			
Ma 1 -042	Höhere Werkstofftechnik	K2(70%) + LP(30%)		6			
Ma 1 -052	Vertiefung Technische Mechanik	K2		6			
Ma 2 -032	Höhere Konstruktionslehre	K1	PA		6		
Ma 2 -042	Vertiefung Strömungslehre und Thermodynamik	PR + EDRP			6		
Ma 2 -052	Fertigungsorganisation	PA + R			6		
	Wahlpflichtmodule				6	6	
Ma 2 -011	Masterpraxisprojekt	ST			6	6	
Ma 3 -052	Fertigungstechnologien – Optik	BÜ				6	
Ma 3 -041	Vertiefung Fertigungsmesstechnik	BÜ	LP			6	
Ma 3 -021	Ringvorlesung Qualitätsmanagement	K1(50%) + R(50%)				6	
Ma 4 -011	Masterabschlussarbeit	A + R					28
Ma 4 -011	Kolloquium	KQ					2
	Summe			30	30	30	30

Erläuterungen und Abkürzungen siehe Seite 9.

(4) Masterstudiengang Medizintechnik

Modul-Nr.	Modulname	Prüfungsart		Credits/Semester			
		PL	SL	1	2	3	4
Ma 1 -011	Vertiefung Mathematik	K2		6			
Ma 1 -021	Simulation	EA	LP	6			
Ma 1 -061	Vertiefung Medizintechnik	K1(80%) + LP(20%)		6			
Ma 1 -062	Vertiefung Medizininformatik	K1(40%) + BÜ(60%)		6			
Ma 1 -063	Entrepreneurship – Gründung und Ideen	K1(50%) + R(50%)		6			
Ma 2 -061	Digitale Diagnostik - Bildverarbeitung	PR oder BÜ			6		
Ma 2 -062	Mensch-Maschine-Interaktion 1	R(50%) + PA(50%)			6		
Ma 2 -063	Entrepreneurship – Produkte, Kunden und Markt	K1(50%) + R(50%)			6		
	Wahlpflichtmodule				6	6	
Ma 2 -011	Masterpraxisprojekt	ST			6	6	
Ma 3 -061	Digitale Diagnostik – Mobile Health und Telemedizin	PA				6	
Ma 3 -062	Mensch-Maschine-Interaktion 2	H(50%) + R(50%)				6	
Ma 3 -021	Ringvorlesung Qualitätsmanagement	K1(50%) + R(50%)				6	
Ma 4 -011	Masterabschlussarbeit	A + R					28
Ma 4 -011	Kolloquium	KQ					2
	Summe			30	30	30	30

Erläuterungen und Abkürzungen siehe Seite 9.

(5) Studienschwerpunkte und deren zugeordnete Wahlpflichtmodule^(SP)

Zusätzliche Wahlpflichtmodule mit zugeordnetem Studienschwerpunkt können gemäß § 3 von der Prüfungskommission festgelegt werden. Die jeweils aktuelle Liste aller Wahlpflichtmodule wird rechtzeitig zu Semesterbeginn in der Prüfungsverwaltung per Aushang sowie elektronisch veröffentlicht.

Wählbare Schwerpunkte Masterstudiengang Elektrotechnik/Informationstechnik:

SP Automatisierungstechnik		Prüfungsart		Credits/Semester	
Modul-Nr.	Modulname	PL	SL	1	2
Ma 1 -034	Robotik	K2 + PA + R	LP	6	
Ma 2 -034	Mess- und Antriebssysteme	K2	LP		6

SP Ingenieurinformatik		Prüfungsart		Credits/Semester	
Modul-Nr.	Modulname	PL	SL	1	2
Ma 1 -033	Machine Learning und Big Data	PA		6	
Ma 2 -033	Kommunikationssysteme	K2	LP		6

(6) Erläuterungen/Abkürzungen

Abkürzung	Bezeichnung
MA	Master
PL	Prüfungsleistung
PVL	Prüfungsvorleistung
SL	Studienleistung
A	Abschlussarbeit
BÜ	Berufspraktische Übungen
E	Entwurf
EA	Experimentelle Arbeit
EDRP	Erstellung und Dokumentation von Rechnerprogrammen
H	Hausarbeit
K1/K2	Klausur (1 Std./2 Std.)
KQ	Kolloquium
LP	Laborpraktikum
M	Mündliche Prüfung
P	Projekt
PA	Projektarbeit
PR	Präsentation
R	Referat
SP	Wahlpflichtmodule mit zugeordnetem Studienschwerpunkt
ST	Studienarbeit

Anlage 2: Masterurkunde

MASTERURKUNDE

**Die HAWK
Hochschule für angewandte Wissenschaft und Kunst
Hildesheim/Holzminde/Göttingen
Fakultät Ingenieurwissenschaften und Gesundheit**

verleiht mit dieser Urkunde

geboren am **«Vorname» «Nachname»**
«Geburtsdatum» in «Geburtsort»

den Hochschulgrad **Master of Engineering/Science**
abgekürzt M.Eng./M.Sc.,
nachdem die Abschlussprüfung im Studiengang

**«Studiengang»
«Studienschwerpunkt»**

bestanden wurde.

Göttingen «Datum»

«Dekan*in»

«Studiendekan*in»

Anlage 3: Masterzeugnis

MASTERZEUGNIS

geboren am **«Vorname» «Nachname»**
«Geburtsdatum» in «Geburtsort»

hat die Masterprüfung im Studiengang

«Studiengang»

der Fakultät Ingenieurwissenschaften und Gesundheit in Göttingen
bestanden.

Thema der Masterthesis:

	Credits	Note
Gesamtbewertung	ooo	o,o (in Worten)

Die Gesamtnote ergibt sich aus den Modulnoten gemäß Anlage zum Masterzeugnis.

Göttingen, den «PruefDatum»

«Studiendekan*in»

Anlage 4: Diploma Supplement (Muster)

DIPLOMA SUPPLEMENT

This Diploma Supplement model was developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international 'transparency' and fair academic and professional recognition of qualifications (diplomas, degrees, certificates, etc.). It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free from any value judgements, equivalence statements or suggestions about recognition. Information in all eight sections should be provided. Where information is not provided, an explanation should give the reason why.

1. Information identifying the holder of the qualification

1.1	Family name(s)	Nachname	1.2	First name(s)	Vorname
1.3	Date of birth	oo.oo.oooo	1.4	Student ID Number or code	oooooo

2. Information identifying the qualification

2.1 Name of Qualification and (if applicable) title conferred (in original language)
Master of Engineering – M.Eng. Elektrotechnik/Informationstechnik

2.2 Main field(s) of study for the qualification
Electrical Engineering/Information Technology

2.3 Name and status of awarding institution (in original language)
HAWK Hochschule für angewandte Wissenschaft und Kunst
Hildesheim/Holzwinden/Göttingen
Fakultät Ingenieurwissenschaften und Gesundheit
University of Applied Sciences and Arts / State Institution

2.4 Name and status of institution administering studies (in original language)
[as above]

2.5 Language(s) of instruction/examination
German

3. Information on the level and duration of the qualification

3.1 Level of the qualification
Master programme, graduate, second degree

3.2 Official duration of programme in credits and/or years
Two years, 4 semesters, 120 ECTS

3.3 Access requirement(s)
General Higher Education Entrance Qualification or Entrance Qualification to Universities of Applied Sciences, or foreign equivalent.

4. Information on the programme completed and the results obtained

4.1 Mode of Study
Full Time Study
In the event of part-time study (individual application required), the official length of the programme will be extended accordingly.

4.2 Programme learning outcomes
The master program offers an advanced scientific and application-oriented education in the fields of electrical engineering

and information technology. Its courses can be assigned to three groups. The first contains courses which are mandatory for all our master of engineering/science students. These are advanced mathematics, numerical simulation and quality management. The second includes mandatory advanced electrical engineering and information technology courses such as transmission and high frequency technology, control technology, signal and image processing, software engineering, sensor systems and web technology. These courses add scientific and application-oriented competences. The third group allows for specialisation. Depending on the chosen elective modules an emphasis on e.g. "Automatisierungstechnik" which requires advanced measurement and automation technology and robotics or "Ingenieurinformatik" which requires machine learning, big data and mobile communication technology can be laid. The selection of advanced elective technical modules allows for a personal focus on specialised technical fields. In addition non-technical subjects are offered in elective courses on e.g. business administration or project management. To improve the student's skills in teamwork and scientific work a mandatory master project is conducted concurrently to other courses. Finally, in the master thesis a scientific project is accomplished in order to prove scientific and application-oriented knowledge and skills.

- 4.3 Programme details, individual credits gained and grades/marks obtained
Please refer to the Certificate (Masterzeugnis) for a list of courses and grades.
- 4.4 Grading system and , if available, grade distribution table
Absolute grading scheme: "Sehr Gut" (1,0; 1,3) = Very Good; "Gut" (1,7; 2,0; 2,3) = Good; "Befriedigend" (2,7; 3,0; 3,3) = Satisfactory; "Ausreichend" (3,7; 4,0) = Pass; "Nicht ausreichend" (5,0) = Fail
Statistical distribution of grades: **grading table**
- 4.5 Overall classification of the qualification **o,o**
The final grade is based on the grades awarded during the study programme and that of the final thesis (with oral component). Please refer to the Certificate (Masterzeugnis).
When there are no marks given, not enough results are available yet to determine ECTS-grades.

5. Information on the function of the qualification

- 5.1 Access to further study
The degree entitles its holder to apply for admission for a doctoral thesis according to the regulations covering doctoral programmes, respectively.
- 5.2 Access to a regulated profession (if applicable)
The degree entitles its holder to the legally protected professional title "Ingenieur" and to exercise professional work in the field(s) of engineering for which the degree was awarded.

6. Additional information

- 6.1 Additional information
Non-academic acquired competencies were credited in an amount of **00** credits in the following modules: ...
- 6.2 Further information sources
www.hawk.de

7. Certification

This Diploma Supplement refers to the following original documents:

Document on the award of the academic degree (Masterurkunde)	00.00.0000
Certificate (Masterzeugnis)	00.00.0000
Transcript of Records dated from	

Certification Date:	00.00.0000
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(Official Seal / Stamp)

Dean of Studies

8. National higher education system

The information on the national higher education system on the following pages provides a context for the qualification and the type of higher education institution that awarded it.
(siehe Seite 21)

DIPLOMA SUPPLEMENT

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1. Information identifying the holder of the qualification

- | | | | | | |
|-----|----------------|-------------------|-----|---------------------------|----------------|
| 1.1 | Family name(s) | Nachname | 1.2 | First name(s) | Vorname |
| 1.3 | Date of birth | oo.oo.oooo | 1.4 | Student ID Number or code | oooooo |

2. Information identifying the qualification

- 2.1 Name of Qualification and (if applicable) title conferred (in original language)
Master of Science – M.Sc. Laser- und Plasmatechnik
- 2.2 Main field(s) of study for the qualification
Laser and Plasma Technology
- 2.3 Name and status of awarding institution (in original language)
HAWK Hochschule für angewandte Wissenschaft und Kunst
Hildesheim/Holzwinden/Göttingen
Fakultät Ingenieurwissenschaften und Gesundheit
University of Applied Sciences and Arts / State Institution
- 2.4 Name and status of institution administering studies (in original language)
[as above]
- 2.5 Language(s) of instruction/examination
German

3. Information on the level and duration of the qualification

- 3.1 Level of the qualification
Master programme, graduate, second degree
- 3.2 Official duration of programme in credits and/or years
Two years, 4 semesters, 120 ECTS
- 3.3 Access requirement(s)
General Higher Education Entrance Qualification or Entrance Qualification to Universities of Applied Sciences, or foreign equivalent.

4. Information on the programme completed and the results obtained

- 4.1 Mode of Study
Full Time Study
In the event of part-time study (individual application required), the official length of the programme will be extended accordingly.
- 4.2 Programme learning outcomes
The program offers profound scientific and practically-orientated education in the field of optical engineering and photonics. The program is strongly related to research and development.
Mandatory courses include Photonics, Optical System Design, Image Processing, Material Science and Plasma Technology. The mandatory courses Advanced Mathematics, Quantum Mechanics and Theoretical Optics cover a profound theoretical background. Mandatory courses with special topics in Laser Treatment, Microscopy and Spectroscopy allow the students to extend their knowledge and skills in some particular aspects of optical technology. The selection of elective courses allows the students to build up a personal emphasis on special subjects related to optical technologies. It also allows the students to choose from some interdisciplinary subjects. Optional compulsory courses on offer include non-technical subjects like Rhetoric. The practical use of the knowledge gained in the courses is an essential part of the educational program. During an integrated project and the final master thesis the students have to prove their ability to solve a certain problem on their own.

- 4.3 Programme details, individual credits gained and grades/marks obtained
Please refer to the Certificate (Masterzeugnis) for a list of courses and grades.
- 4.4 Grading system and , if available, grade distribution table
Absolute grading scheme: "Sehr Gut" (1,0; 1,3) = Very Good; "Gut" (1,7; 2,0; 2,3) = Good; "Befriedigend" (2,7; 3,0; 3,3) = Satisfactory; "Ausreichend" (3,7; 4,0) = Pass; "Nicht ausreichend" (5,0) = Fail
Statistical distribution of grades: **grading table**
- 4.5 Overall classification of the qualification **o,o**
The final grade is based on the grades awarded during the study programme and that of the final thesis (with oral component). Please refer to the Certificate (Masterzeugnis).
When there are no marks given, not enough results are available yet to determine ECTS-grades.

5. Information on the function of the qualification

- 5.1 Access to further study
The degree entitles its holder to apply for admission for a doctoral thesis according to the regulations covering doctoral programmes, respectively.
- 5.2 Access to a regulated profession (if applicable)
The degree entitles its holder to the legally protected professional title "Ingenieur" and to exercise professional work in the field(s) of engineering for which the degree was awarded. The master degree is certified for the professional entry to the higher grade civil service (Laufbahngruppe 2, zweites Einstiegsamt) in Germany.

6. Additional information

- 6.1 Additional information
Non-academic acquired competencies were credited in an amount of **00** credits in the following modules: ...
- 6.2 Further information sources
www.hawk.de

7. Certification

This Diploma Supplement refers to the following original documents:

Document on the award of the academic degree (Masterurkunde)	00.00.0000
Certificate (Masterzeugnis)	00.00.0000
Transcript of Records dated from	

Certification Date:	00.00.0000
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(Official Seal / Stamp)

Dean of Studies

8. National higher education system

The information on the national higher education system on the following pages provides a context for the qualification and the type of higher education institution that awarded it.
(siehe Seite 21)

DIPLOMA SUPPLEMENT

This Diploma Supplement model was developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international 'transparency' and fair academic and professional recognition of qualifications (diplomas, degrees, certificates, etc.). It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free from any value judgements, equivalence statements or suggestions about recognition. Information in all eight sections should be provided. Where information is not provided, an explanation should give the reason why.

1. Information identifying the holder of the qualification

- | | | | | | |
|-----|----------------|-------------------|-----|---------------------------|----------------|
| 1.1 | Family name(s) | Nachname | 1.2 | First name(s) | Vorname |
| 1.3 | Date of birth | oo.oo.oooo | 1.4 | Student ID Number or code | oooooo |

2. Information identifying the qualification

- 2.1 Name of Qualification and (if applicable) title conferred (in original language)
Master of Engineering – M.Eng. Präzisionsmaschinenbau
- 2.2 Main field(s) of study for the qualification
Mechanical Engineering/Precision Machining
- 2.3 Name and status of awarding institution (in original language)
HAWK Hochschule für angewandte Wissenschaft und Kunst
Hildesheim/Holz Minden/Göttingen
Fakultät Ingenieurwissenschaften und Gesundheit
University of Applied Sciences and Arts / State Institution
- 2.4 Name and status of institution administering studies (in original language)
[as above]
- 2.5 Language(s) of instruction/examination
German

3. Information on the level and duration of the qualification

- 3.1 Level of the qualification
Master programme, graduate, second degree
- 3.2 Official duration of programme in credits and/or years
Two years, 4 semesters, 120 ECTS
- 3.3 Access requirement(s)
General Higher Education Entrance Qualification or Entrance Qualification to Universities of Applied Sciences, or foreign equivalent.

4. Information on the programme completed and the results obtained

- 4.1 Mode of Study
Full Time Study
In the event of part-time study (individual application required), the official length of the programme will be extended accordingly.
- 4.2 Programme learning outcomes
The program contains an advanced scientific and application-oriented education of Mechanical Engineering in the fields of Mechanics and Optics, especially Mechanical Engineering and Precision Manufacturing. In a first part the students obtain advanced knowledge in Mathematics, Physics, Mechanics, Mechanical Engineering, and Design as well as in Electronics, Electrical Engineering, and Control Engineering. In the second part of studies there are advanced courses in Computer Aided Technologies like CAD/CAM/CAQ/CIM and FEM, Materials Science, and Production Engineering as well as in Mechanical Design and Development, Control Engineering, Quality Control, and Advanced Laser Treatment. Precision Machine Construction and Optical and Mechanical Assembly are specialized on a scientific level. Moreover the students earn interdisciplinary and non-technical knowledge in Business Management and other skills like Presentation Techniques as well as Leadership and Negotiation Methodology. Scientific principles are applied to real problems usually arising from research activities of the department or from industrial partners. Scientific solution strategies are developed and applied to hands-on problems. The

application of acquired knowledge is an emphasis of the whole program. During an integrated practical period in the industry and the final application-oriented Master Thesis the students have to prove their capabilities to solve selected problems on their own.

- 4.3 Programme details, individual credits gained and grades/marks obtained
Please refer to the Certificate (Masterzeugnis) for a list of courses and grades.
- 4.4 Grading system and , if available, grade distribution table
Absolute grading scheme: "Sehr Gut" (1,0; 1,3) = Very Good; "Gut" (1,7; 2,0; 2,3) = Good; "Befriedigend" (2,7; 3,0; 3,3) = Satisfactory; "Ausreichend" (3,7; 4,0) = Pass; "Nicht ausreichend" (5,0) = Fail
Statistical distribution of grades: **grading table**
- 4.5 Overall classification of the qualification **o,o**
The final grade is based on the grades awarded during the study programme and that of the final thesis (with oral component). Please refer to the Certificate (Masterzeugnis).
When there are no marks given, not enough results are available yet to determine ECTS-grades.

5. Information on the function of the qualification

- 5.1 Access to further study
The degree entitles its holder to apply for admission for a doctoral thesis according to the regulations covering doctoral programmes, respectively.
- 5.2 Access to a regulated profession (if applicable)
The degree entitles its holder to the legally protected professional title "Ingenieur" and to exercise professional work in the field(s) of engineering for which the degree was awarded.

6. Additional information

- 6.1 Additional information
Non-academic acquired competencies were credited in an amount of **00** credits in the following modules: ...
- 6.2 Further information sources
www.hawk.de

7. Certification

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Dean of Studies

8. National higher education system

The information on the national higher education system on the following pages provides a context for the qualification and the type of higher education institution that awarded it.
(siehe Seite 21)

DIPLOMA SUPPLEMENT

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1. Information identifying the holder of the qualification

1.1	Family name(s)	Nachname	1.2	First name(s)	Vorname
1.3	Date of birth	oo.oo.oooo	1.4	Student ID Number or code	oooooo

2. Information identifying the qualification

- 2.1 Name of Qualification and (if applicable) title conferred (in original language)
Master of Engineering – M.Eng. Medizintechnik
- 2.2 Main field(s) of study for the qualification
Medical Technology
- 2.3 Name and status of awarding institution (in original language)
HAWK Hochschule für angewandte Wissenschaft und Kunst
Hildesheim/Holzwinden/Göttingen
Fakultät Ingenieurwissenschaften und Gesundheit
University of Applied Sciences and Arts / State Institution
- 2.4 Name and status of institution administering studies (in original language)
[as above]
- 2.5 Language(s) of instruction/examination
German

3. Information on the level and duration of the qualification

- 3.1 Level of the qualification
Master programme, graduate, second degree
- 3.2 Official duration of programme in credits and/or years
Two years, 4 semesters, 120 ECTS
- 3.3 Access requirement(s)
General Higher Education Entrance Qualification or Entrance Qualification to Universities of Applied Sciences, or foreign equivalent.

4. Information on the programme completed and the results obtained

- 4.1 Mode of Study
Full Time Study
In the event of part-time study (individual application required), the official length of the programme will be extended accordingly.
- 4.2 Programme learning outcomes
The master program offers an advanced scientific and application-oriented education in the fields of medical technology. Its courses can be assigned to three groups.
The first contains courses which are mandatory for all our master of engineering/science students. These are advanced mathematics, numerical simulation and quality management.
The second includes mandatory advanced medical informatics/technology, digital diagnostics, human-machine interaction, and entrepreneurship. The latter provides students with the necessary knowledge to transfer innovations from the research lab into products. In the process, they are taught both entrepreneurial and regulatory expertise. These courses add scientific, application-oriented, business and regulatory competences.
The third group allows specialization. The selection of advanced elective technical modules allows for a personal focus on specialized technical fields. Besides, non-technical subjects are offered in elective courses on, e.g., business administration

or project management. To improve the student's teamwork and scientific work skills, a mandatory master project is conducted concurrently with other courses. Finally, in the master thesis, a scientific project is accomplished to prove scientific and application-oriented knowledge and skills.

- 4.3 Programme details, individual credits gained and grades/marks obtained
Please refer to the Certificate (Masterzeugnis) for a list of courses and grades.
- 4.4 Grading system and , if available, grade distribution table
Absolute grading scheme: "Sehr Gut" (1,0; 1,3) = Very Good; "Gut" (1,7; 2,0; 2,3) = Good; "Befriedigend" (2,7; 3,0; 3,3) = Satisfactory; "Ausreichend" (3,7; 4,0) = Pass; "Nicht ausreichend" (5,0) = Fail
Statistical distribution of grades: **grading table**
- 4.5 Overall classification of the qualification **o,o**
The final grade is based on the grades awarded during the study programme and that of the final thesis (with oral component). Please refer to the Certificate (Masterzeugnis).
When there are no marks given, not enough results are available yet to determine ECTS-grades.

5. Information on the function of the qualification

- 5.1 Access to further study
The degree entitles its holder to apply for admission for a doctoral thesis according to the regulations covering doctoral programmes, respectively.
- 5.2 Access to a regulated profession (if applicable)
The degree entitles its holder to the legally protected professional title "Ingenieur" and to exercise professional work in the field(s) of engineering for which the degree was awarded.

6. Additional information

- 6.1 Additional information
Non-academic acquired competencies were credited in an amount of **00** credits in the following modules: ...
- 6.2 Further information sources
www.hawk.de

7. Certification

This Diploma Supplement refers to the following original documents:

Document on the award of the academic degree
(Masterurkunde) **00.00.0000**
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Dean of Studies

8. National higher education system

The information on the national higher education system on the following pages provides a context for the qualification and the type of higher education institution that awarded it.
(siehe Seite 21)

8. Information on the German higher education systemⁱ

8.1 Types of institutions and institutional status

Higher education (HE) studies in Germany are offered at three types of Higher Education Institutions (HEI).ⁱⁱ

- *Universitäten* (Universities) including various specialized institutions, offer the whole range of academic disciplines. In the German tradition, universities focus in particular on basic research so that advanced stages of study have mainly theoretical orientation and research-oriented components.

- *Fachhochschulen (FH)/Hochschulen für Angewandte Wissenschaften (HAW)* (Universities of Applied Sciences, UAS) concentrate their study programmes in engineering and other technical disciplines, business-related studies, social work, and design areas. The common mission of applied research and development implies an application-oriented focus of studies, which includes integrated and supervised work assignments in industry, enterprises or other relevant institutions.

- *Kunst- und Musikhochschulen* (Universities of Art/Music) offer studies for artistic careers in fine arts, performing arts and music; in such fields as directing, production, writing in theatre, film, and other media; and in a variety of design areas, architecture, media and communication.

Higher Education Institutions are either state or state-recognized institutions. In their operations, including the organization of studies and the designation and award of degrees, they are both subject to higher education legislation.

8.2 Types of programmes and degrees awarded

Studies in all three types of institutions have traditionally been offered in integrated "long" (one-tier) programmes leading to *Diplom-* or *Magister Artium* degrees or completed by a *Staatsprüfung* (State Examination).

Within the framework of the Bologna-Process one-tier study programmes are successively being replaced by a two-tier study system. Since 1998, two-tier degrees (Bachelor's and Master's) have been introduced in almost all study programmes. This change is designed to provide enlarged variety and flexibility for students in planning and pursuing educational objectives; it also enhances international compatibility of studies.

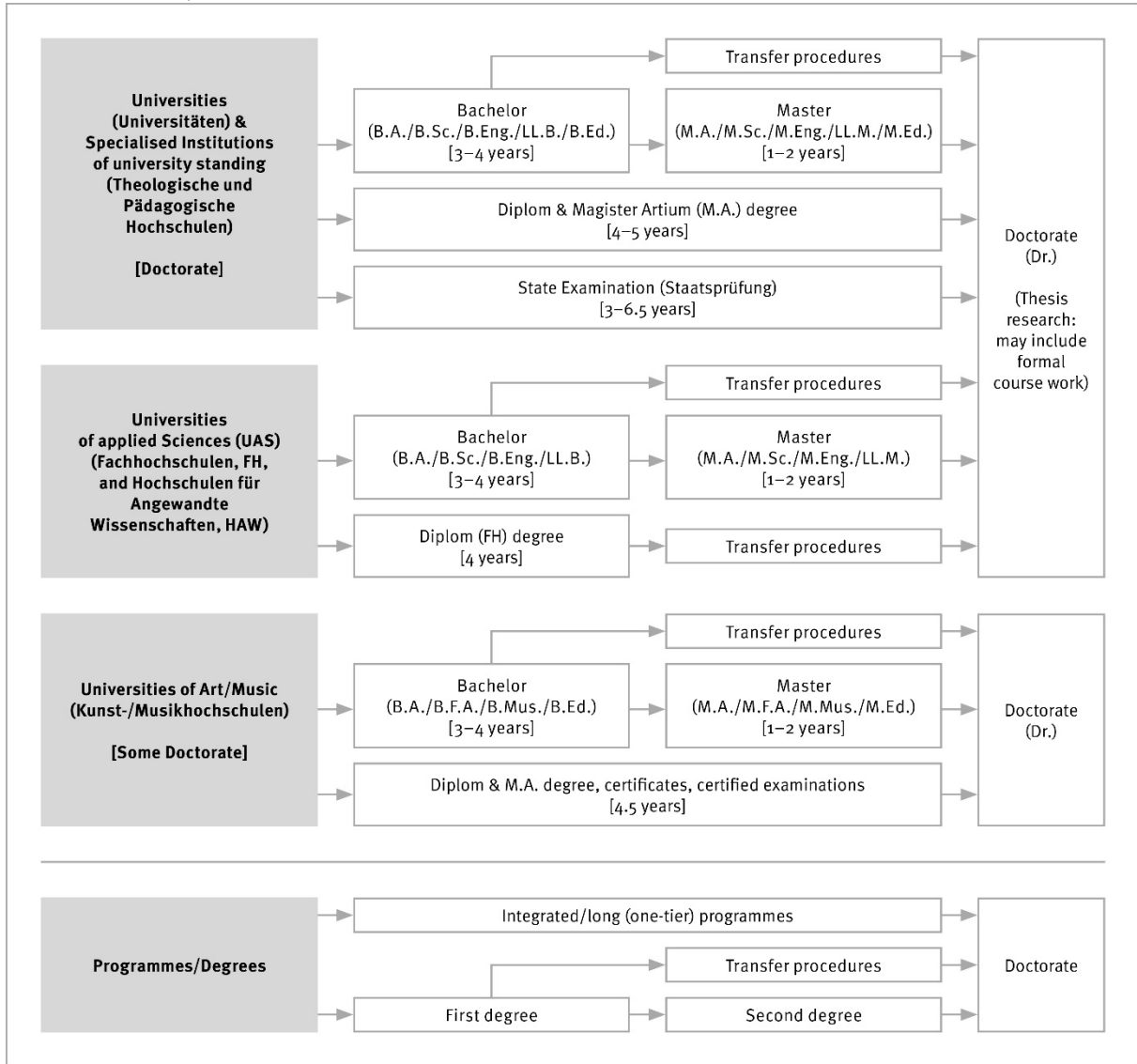
The German Qualifications Framework for Higher Education Qualifications (HQR)ⁱⁱⁱ describes the qualification levels as well as the resulting qualifications and competences of the graduates. The three levels of the HQR correspond to the levels 6, 7 and 8 of the German Qualifications Framework for Lifelong Learning^{iv} and the European Qualifications Framework for Lifelong Learning^v.

For details cf. Sec. 8.4.1, 8.4.2, and 8.4.3 respectively. Table 1 provides a synoptic summary.

8.3 Approval/Accreditation of programmes and degrees

To ensure quality and comparability of qualifications, the organisation of studies and general degree requirements have to conform to principles and regulations established by the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany (KMK).^{vi} In 1999, a system of accreditation for Bachelor's and Master's programmes has become operational. All new programmes have to be accredited under this scheme; after a successful accreditation they receive the seal of the Accreditation Council.^{vii}

Table 1: Institutions, programmes and degrees in German higher education



8.4 Organisation and structure of studies

The following programmes apply to all three types of institutions. Bachelor's and Master's study programmes may be studied consecutively, at various higher education institutions, at different types of higher education institutions and with phases of professional work between the first and the second qualification. The organisation of the study programmes makes use of modular components and of the European Credit Transfer and Accumulation System (ECTS) with 30 credits corresponding to one semester.

8.4.1 Bachelor

Bachelor's degree programmes lay the academic foundations, provide methodological competences and include skills related to the professional field. The Bachelor's degree is awarded after 3 to 4 years. The Bachelor's degree programme includes a thesis requirement. Study programmes leading to the Bachelor's degree must be accredited according to the Interstate study accreditation treaty.^{viii}

First degree programmes (Bachelor) lead to Bachelor of Arts (B.A.), Bachelor of Science (B.Sc.), Bachelor of Engineering (B.Eng.), Bachelor of Laws (LL.B.), Bachelor of Fine Arts (B.F.A.), Bachelor of Music (B.Mus.) or Bachelor of Education (B.Ed.). The Bachelor's degree corresponds to level 6 of the German Qualifications Framework/ European Qualifications Framework.

8.4.2 Master

Master is the second degree after another 1 to 2 years. Master's programmes may be differentiated by the profile types "practice-oriented" and "research-oriented". Higher Education Institutions define the profile. The Master's degree programme includes a thesis requirement. Study programmes leading to the Master degree must be accredited according to the Interstate study accreditation treaty.^{ix}

Second degree programmes (Master) lead to Master of Arts (M.A.), Master of Science (M.Sc.), Master of Engineering (M.Eng.), Master of Laws (L.L.M.), Master of Fine Arts (M.F.A.), Master of Music (M.Mus.) or Master of Education (M.Ed.). Master's programmes which are designed for continuing education may carry other designations (e.g. MBA).

The Master degree corresponds to level 7 of the German Qualifications Framework/ European Qualifications Framework.

8.4.3 Integrated "long" programmes (one-tier): *Diplom* degrees, *Magister Artium*, *Staatsprüfung*

An integrated study programme is either mono-disciplinary (*Diplom* degrees, most programmes completed by a *Staatsprüfung*) or comprises a combination of either two major or one major and two minor fields (*Magister Artium*). The first stage (1.5 to 2 years) focuses on broad orientations and foundations of the field(s) of study. An Intermediate Examination (*Diplom-Vorprüfung* for *Diplom* degrees; *Zwischenprüfung* or credit requirements for the *Magister Artium*) is prerequisite to enter the second stage of advanced studies and specialisations. Degree requirements include submission of a thesis (up to 6 months duration) and comprehensive final written and oral examinations. Similar regulations apply to studies leading to a *Staatsprüfung*. The level of qualification is equivalent to the Master's level.

- Integrated studies at *Universitäten (U)* last 4 to 5 years (*Diplom* degree, *Magister Artium*) or 3.5 to 6.5 years (*Staatsprüfung*).

The *Diplom* degree is awarded in engineering disciplines, the natural sciences as well as economics and business. In the humanities, the corresponding degree is usually the *Magister Artium* (M.A.). In the social sciences, the practice varies as a matter of institutional traditions. Studies preparing for the legal, medical and pharmaceutical professions are completed by a *Staatsprüfung*. This applies also to studies preparing for teaching professions of some *Länder*.

The three qualifications (*Diplom*, *Magister Artium* and *Staatsprüfung*) are academically equivalent and correspond to level 7 of the German Qualifications Framework/ European Qualifications Framework.

They qualify to apply for admission to doctoral studies. Further prerequisites for admission may be defined by the Higher Education Institution, cf. Sec. 8.5.

- Integrated studies at *Fachhochschulen (FH)*/ *Hochschulen für Angewandte Wissenschaften (HAW)* Universities of Applied Sciences (UAS) last 4 years and lead to a *Diplom (FH)* degree which corresponds to level 6 of the German Qualifications Framework/ European Qualifications Framework.

Qualified graduates of FH/HAW/UAS may apply for admission to doctoral studies at doctorate-granting institutions, cf. Sec. 8.5.

- Studies at *Kunst- and Musikhochschulen* (Universities of Art/Music etc.) are more diverse in their organisation, depending on the field and individual objectives. In addition to *Diplom/Magister* degrees, the integrated study programme awards include certificates and certified examinations for specialised areas and professional purposes.

8.5 Doctorate

Universities as well as specialised institutions of university standing, some of the FH/HAW/UAS and some Universities of Art/Music are doctorate-granting institutions. Formal prerequisite for admission to doctoral work is a qualified Master's degree (UAS and U), a *Magister* degree, a *Diplom*, a *Staatsprüfung*, or a foreign equivalent. Comparable degrees from universities of art and music can in exceptional cases (study programmes such as music theory, musicology, pedagogy of arts and music, media studies) also formally qualify for doctoral work. Particularly qualified holders of a Bachelor's degree or a *Diplom (FH)* degree may also be admitted to doctoral studies without acquisition of a further degree by means of a procedure to determine their aptitude. The universities respectively the doctorate-granting institutions regulate entry to a doctorate as well as the structure of the procedure to determine aptitude. Admission further requires the acceptance of the Dissertation research project by a professor as a supervisor.

The doctoral degree corresponds to level 8 of the German Qualifications Framework/ European Qualifications Framework.

8.6 Grading scheme

The grading scheme in Germany usually comprises five levels (with numerical equivalents; intermediate grades may be given): "*Sehr Gut*" (1) = Very Good; "*Gut*" (2) = Good; "*Befriedigend*" (3) = Satisfactory; "*Ausreichend*" (4) = Sufficient; "*Nicht ausreichend*" (5) = Non-Sufficient/Fail. The minimum passing grade is "*Ausreichend*" (4). Verbal designations of grades may vary in some cases and for doctoral degrees.

In addition, grade distribution tables as described in the ECTS Users' Guide are used to indicate the relative distribution of grades within a reference group.

8.7 Access to higher education

The General Higher Education Entrance Qualification (*Allgemeine Hochschulreife, Abitur*) after 12 to 13 years of schooling allows for admission to all higher educational studies. Specialised variants (*Fachgebundene Hochschulreife*) allow for admission at *Fachhochschulen (FH)*/*Hochschulen für Angewandte Wissenschaften (HAW)* (UAS), universities and equivalent higher education institutions, but only in particular disciplines. Access to study programmes at *Fachhochschulen (FH)*/*Hochschulen für Angewandte Wissenschaften (HAW)* (UAS), is also possible with a *Fachhochschulreife*, which can usually be acquired after 12 years of schooling. Admission to study programmes at Universities of Art/Music and comparable study programmes at other higher education institutions as well as admission to a study programme in sports may be based on other or additional evidence demonstrating individual aptitude.

Applicants with a qualification in vocational education and training but without a school-based higher education entrance qualification are entitled to a general higher education entrance qualification and thus to access to all study programmes, provided they have obtained advanced further training certificates in particular state-regulated vocational fields (e.g. *Meister/Meisterin im Handwerk, Industriemeister/in, Fachwirt/in (IHK), Betriebswirt/in (IHK) und (HWK), staatlich geprüfte/r Techniker/in, staatlich geprüfte/r Betriebswirt/in, staatlich geprüfte/r Gestalter/in, staatlich geprüfte/r Erzieher/in*). Vocationally qualified applicants can obtain a *Fachgebundene Hochschulreife* after completing a state-regulated vocational education of at least two years' duration plus professional practice of normally at least three years' duration, after having successfully passed an aptitude test at a higher education institution or other state institution; the aptitude test may be replaced by successfully completed trial studies of at least one year's duration.^x

Higher Education Institutions may in certain cases apply additional admission procedures.

8.8 National sources of information

- *Kultusministerkonferenz (KMK)* [Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany]; Graurheindorfer Str. 157, D-53117 Bonn; Phone: +49[0]228/501-0, www.kmk.org; E-Mail: hochschulen@kmk.org
- Central Office for Foreign Education (ZaB) as German NARIC; www.kmk.org; E-Mail: zab@kmk.org
- German information office of the *Länder* in the EURYDICE Network, providing the national dossier on the education system; www.kmk.org; E-Mail: eurydice@kmk.org
- *Hochschulrektorenkonferenz (HRK)* [German Rectors' Conference]; Leipziger Platz 11, D-10117 Berlin, Phone: +49 30 206292-11; www.hrk.de; E-Mail: post@hrk.de
- "Higher Education Compass" of the German Rectors' Conference features comprehensive information on institutions, programmes of study, etc. (www.higher-education-compass.de)

ⁱ The information covers only aspects directly relevant to purposes of the Diploma Supplement.

ⁱⁱ *Berufsakademien* are not considered as Higher Education Institutions, they only exist in some of the *Länder*. They offer educational programmes in close cooperation with private companies. Students receive a formal degree and carry out an apprenticeship at the company. Some *Berufsakademien* offer Bachelor courses which are recognised as an academic degree if they are accredited by the Accreditation Council.

ⁱⁱⁱ German Qualifications Framework for Higher Education Degrees. (Resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany of 16 February 2017).

^{iv} German Qualifications Framework for Lifelong Learning (DQR). Joint resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany, the German Federal Ministry of Education and Research, the German Conference of Economics Ministers and the German Federal Ministry of Economics and Technology (Resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany of 15 November 2012). More information at www.dqr.de

^v Recommendation of the European Parliament and the European Council on the establishment of a European Qualifications Framework for Lifelong Learning of 23 April 2008 (2008/C 111/01 – European Qualifications Framework for Lifelong Learning – EQF).

^{vi} Specimen decree pursuant to Article 4, paragraphs 1 – 4 of the interstate study accreditation treaty (Resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany of 7 December 2017).

^{vii} Interstate Treaty on the organisation of a joint accreditation system to ensure the quality of teaching and learning at German higher education institutions (Interstate study accreditation treaty) (Decision of the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany of 8 December 2016), Enacted on 1 January 2018.

^{viii} See note No. 7.

^{ix} See note No. 7.

^x Access to higher education for applicants with a vocational qualification, but without a school-based higher education entrance qualification (Resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany of 6 March 2009).